ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Review a Gross Leakrate Determination Calculation

JPM Number: SRO-A 1-1

KA Number and Importance: 1940012107 Conduct of Operations - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.
SRO – 4.7

Suggested Environment: Classroom

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:

0 SOP LEAKRATE-001 RCS Leakrate Surveillance, Evaluation and Leak Identification

INITIAL CONDITIONS:

The plant has been operating at 100% Power for 200 days.
An increase in containment humidity has been observed
An RO performed a Gross Leakrate Determination in accordance with 0-SOP-LEAKRATE-001.

Non-RCPB Leakage from previous evaluation 0.15 gpm
Previously identified leakage from previous evaluation 0.03 gpm

INITIATING CUES:

You are the CRS and the SM has directed you to review the Gross Leakrate Determination.

TASK STANDARD:

Gross Leakrate Calculation reviewed and errors found.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain current copy of procedure	Candidate will be given the procedure	
3.	Evaluate Manual Calculations	See Below	
●4.	Calculate Total Time	Determine Total Time is 127 minutes NOT 137 minutes	
5.	Calculate Change in Mass due to Change in Pressurizer Level	Determine 6.26 gallons is correct	
6.	Calculate Change in VCT Mass due to change in level	Determine 104.48 gallons is correct	
●7.	Calculate Change in RCS mass due to change in Tavg	Determine – 8.64 is incorrect it should be + 8.64 gallons	
●8.	Calculate Gross Leakage	Determine 102.1 is incorrect; it should be 119.38 gallons	
●9.	Calculate Gross Leakage LR_1	Determine 0.74 gpm is NOT correct; it should be 0.94	
●10.	Calculate Unidentified Leakage	Determine 0.56 gpm is NOT correct; it should be 0.76 gpm	
●11.	Candidate does Not Sign the form		
12.	JPM Complete		

RCS LEAKRATE SURVEILLANCE, EVALUATION AND LEAK IDENTIFICATION	No: 0-SOP-LEAKRATE-001 Rev: 1
	Page 49 of 63

ATTACHMENT 2
CALCULATING GROSS RCS LEAKAGE
(Page 1 of 2)

Date: TODAY

NOTE: PERFORM this attachment only when PZR is ≥ 2200 psi and ≤ 2245 psi, **OR** T_{AVG} is ≥ 563 °F AND T_{AVG} is within ±1.5°F from T_{REF}.

1.0 RCS Manual Leakrate Calculation Worksheet: Circle one: **Unit 2** **Unit 3**

( ): Indicates mathematical sign must be observed.

Answer Key

a) CALCULATE total time [T]

Final: Time 13:24

Initial: Time - 10:17

Elapsed Time 137 127 minutes [T]

b) Change in RCS mass due to change in PZR Level [A]. [D] is normalized PZR volume change.

Final: PZR Level 47.0 %

Initial: PZR Level - 47.1 %

Difference: (-) 0.1 % X (- 62.6 gal/%) = (+) 6.26 gal [D]
[A]

c) Change in VCT Mass due to change in VCT Level [B]. [E] is the normalized VCT volume change.

Final: VCT Level 30.33

Initial: VCT Level - 35.8

Difference: (-) 5.47 % X (-19.1 gal/%) = (+) 104.48 gal [E]
[B]

d) Change in RCS Mass due to change in T_{AVE} [C]. [F] is normalized RCS Water Volume change.

Final: T_{AVE} 569.0 °F

Initial: T_{AVE} - 568.9 °F + 8.64

Difference: (-) 0.1 + 1 °F X (86.444 gal/°F) = (-) 8.64 gal [F]
[C]

RCS LEAKRATE SURVEILLANCE, EVALUATION AND LEAK IDENTIFICATION	No: 0-SOP-LEAKRATE-001 Rev: 1
	Page 50 of 63

ATTACHMENT 2
CALCULATING GROSS RCS LEAKAGE
(Page 2 of 2)

Answer Key

2.0 CALCULATE: Gross Leakage (gpm) [LR_1]:

= [(Normalized values: ([D] + [E] + [F]) / Δ Time (minutes T)]

= ([D] 6.26 / 119.38 + [E] 104.48 + [F] 8.64 + 8.64) = 102.1 (G) gal. Change in System Volume

= 102.1 (G) gal. / T = 0.74 0.94 gpm Gross Leakage [LR_1]

a) RECORD Non-RCPB Leakage (from previous Evaluation [LR_2]): 0.15 gpm

b) RECORD previously Identified Leakage (from previous Evaluation [LR_3]): 0.03 gpm

NOTE

A positive number indicates a net removal of mass from the system.

3.0 CALCULATE Unidentified Leakage:

0.74 0.94 gpm [LR_1] - 0.15 gpm [LR_2] - 0.03 gpm [LR_3] = 0.56 0.76 gpm [$LR_{Unidentified}$]

4.0 RECORD [LR_1] and [$LR_{Unidentified}$] on the applicable lines of step 5.0.

- Use two decimal places to the right of the decimal point for the final value (i.e. 0.04 gpm).

5.0 IF there is an unanticipated gross leakage increase of ≥ 0.05 gpm,
OR it has been ≥ 7 days since section 4.4 or 4.5 was last performed,
THEN PERFORM section 4.4, or 4.5 RCS Leak Rate Evaluation as soon as practical.

a) REFER TO Section 4.3, for Review and Approval of Gross Leakage Calculation.

b) WHEN section 5.0 is completed,
THEN PLACE completed forms in appropriate CCR binder.

Gross Leakage [LR_1]: 0.75 0.94 gpm

Unidentified Leakage [$LR_{Unidentified}$]: 0.56 0.76 gpm

Performed by: Reactor Operator Reactor Operator Today (RO)

Reviewed by: _____ (CRS/SM)
Print name Signature Date

Comments: _____

File: 2000051602.doc
Task Number: 2000050102

Difficulty: 3
0-SOP-LEAKRATE-001

Time: 20 minutes
Administrative

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIAL CONDITIONS:

The plant has been operating at 100% Power for 200 days.
An increase in containment humidity has been observed
An RO performed a Gross Leakrate Determination in accordance with 0-SOP-LEAKRATE-001.

Non-RCPB Leakage from previous evaluation 0.15 gpm
Previously identified leakage from previous evaluation 0.03 gpm

INITIATING CUES:

You are the CRS and the SM has directed you to review the Gross Leakrate Determination.

RCS LEAKRATE SURVEILLANCE, EVALUATION AND LEAK IDENTIFICATION	No: 0-SOP-LEAKRATE-001 Rev: 1
	Page 49 of 63

ATTACHMENT 2
CALCULATING GROSS RCS LEAKAGE
(Page 1 of 2)

Date: TODAY

NOTE: PERFORM this attachment only when PZR is ≥ 2200 psi and ≤ 2245 psi, **OR** T_{AVG} is ≥ 563 °F AND T_{AVG} is within ±1.5°F from T_{REF}.

1.0 RCS Manual Leakrate Calculation Worksheet: Circle one: **Unit 2** **Unit 3**

( ): Indicates mathematical sign must be observed.

a) CALCULATE total time [T]

Final: Time 13:34

Initial: Time - 10:17

Elapsed Time 137 minutes [T]

b) Change in RCS mass due to change in PZR Level [A]. [D] is normalized PZR volume change.

Final: PZR Level 47.0 %

Initial: PZR Level - 47.1 %

Difference: (-) 0.1 % X (- 62.6 gal/%) = (+) 6.26 gal [D]
[A]

c) Change in VCT Mass due to change in VCT Level [B]. [E] is the normalized VCT volume change.

Final: VCT Level 30.33

Initial: VCT Level - 35.8

Difference: (-) 5.47 % X (-19.1 gal/%) = (+) 104.48 gal [E]
[B]

d) Change in RCS Mass due to change in T_{AVE} [C]. [F] is normalized RCS Water Volume change.

Final: T_{AVE} 569.0 °F

Initial: T_{AVE} - 568.9 °F

Difference: (-) 0.1 °F X (86.444 gal/°F) = (-) 8.64 gal [F]
[C]

File:
Task Number:

RCS LEAKRATE SURVEILLANCE, EVALUATION AND LEAK IDENTIFICATION	No: 0-SOP-LEAKRATE-001 Rev: 1
	Page 50 of 63

ATTACHMENT 2
CALCULATING GROSS RCS LEAKAGE
(Page 2 of 2)

2.0 CALCULATE: Gross Leakage (gpm) [LR_1]:

= [(Normalized values: ([D] + [E] + [F]) / Δ Time (minutes T)]

= ([D] 1.26 + [E] 104.98 + [F] -3.64) = 102.1 (G) gal. Change in System Volume

= 102.1 (G) gal. / T = 0.74 gpm Gross Leakage [LR_1]

a) RECORD Non-RCPB Leakage (from previous Evaluation [LR_2]): 0.15 gpm

b) RECORD previously Identified Leakage (from previous Evaluation [LR_3]): 0.05 gpm

NOTE

A positive number indicates a net removal of mass from the system.

3.0 CALCULATE Unidentified Leakage:

0.74 [LR_1] gpm - 0.15 [LR_2] gpm - 0.03 [LR_3] gpm = 0.56 [$LR_{Unidentified}$] gpm

4.0 RECORD [LR_1] and [$LR_{Unidentified}$] on the applicable lines of step 5.0.

- Use two decimal places to the right of the decimal point for the final value (i.e. 0.04 gpm).

5.0 IF there is an unanticipated gross leakage increase of ≥ 0.05 gpm,
OR it has been ≥ 7 days since section 4.4 or 4.5 was last performed,
THEN PERFORM section 4.4, or 4.5 RCS Leak Rate Evaluation as soon as practical.

a) REFER TO Section 4.3, for Review and Approval of Gross Leakage Calculation.

b) WHEN section 5.0 is completed,
THEN PLACE completed forms in appropriate CCR binder.

Gross Leakage [LR_1]: 0.75 gpm

Unidentified Leakage [$LR_{Unidentified}$]: 0.56 gpm

Performed by: Reactor Operator Reactor Operator Today (RO)

Reviewed by: _____ (CRS/SM)
Print name Signature Date

Comments: _____

File:
Task Number:

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Review Reactor Vessel Venting Time Calculation per FR-I.3

JPM Number: SRO A – 1–2

KA Number and Importance: 1940012125 Conduct of Operations - Ability to interpret reference materials such as graphs, curves, tables etc.
SRO – 4.2

Suggested Environment: Classroom

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:
3-FR-I.3 Response to Voids in Reactor Vessel

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. The TSC has calculated Reactor Vessel Venting Time in accordance with FR-I.3 Attachments 4 and 5 using the following information.

Containment pressure	2.5 psig
Containment temperature	160°F
Containment hydrogen conc	1.0%
RCS pressure	1000 psig

INITIATING CUES:

You are the CRS and the SM has directed you to review the Reactor Vessel Venting Time calculation.

TASK STANDARD:

Calculation reviewed and errors identified.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain Current Rev of Procedure	Candidate will be given procedure	
●3	Determine Containment Volume at STP (A)	Calculates 2.40E6 to 2.45E6 Determines TSC did not add 460°	
●4	Determine Maximum Hydrogen volume that can be vented (B) Note this is incorrect because previous calculation was incorrect.	Calculate 4.845E4 to 5.0E4	
●5	Determine Hydrogen flow rate as a function of RCS pressure (C)	2800 to 2950	
●6	Calculate maximum venting time Note this is incorrect because previous calculation was incorrect.	Calculate 15 to 18 minutes	
	JPM Complete		

Number:	Title:	Revision Number:
3-FR-I.3	RESPONSE TO VOIDS IN REACTOR VESSEL	0

Attachment 4 (Attachment page 1 of 1)
INSTRUCTIONS FOR DETERMINING VENTING TIME

1. **DETERMINE Containment Volume at STP - A**

$$A = (2.61 \times 10^6 \text{ Ft}^3) \times \frac{P}{14.7 \text{ psia}} \times \frac{492^\circ R}{T}$$

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

$$A = (2.61 \times 10^6 \text{ Ft}^3) \times \frac{17.2}{14.7 \text{ psia}} \times \frac{492^\circ R}{160 \quad 620}$$

A = (9.39x10^6 2.42x10^6) Ft^3

2. **DETERMINE Maximum Hydrogen volume that can be vented - B**

$$B = \frac{(3\% - \text{Containment Hydrogen Concentration}) \times A}{100\%}$$

B = (1.87x10^5 4.84x10^4) Ft^3

3. **DETERMINE Hydrogen flow rate as a function of RCS pressure - C**

a. CHECK RCS pressure.

b. DETERMINE Hydrogen flow rate using Attachment 5, HYDROGEN FLOW RATE VERSUS RCS PRESSURE, Page 29.

C = 2900 SCFM

4. **CALCULATE maximum venting time:**

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

Maximum venting time = (64.7 16.6) minutes

Answer Key

-END OF ATTACHMENT-

File: 0001251602-1.doc
Task Number: 0001250502

Difficulty: 2
3-FR-I.3

Time: 15 minutes
Administrative

Any area of weakness observed? YES ☐ NO ☐

Examinee Signature

All areas of observed weakness discussed

Evaluator Initials

Description of problem area:

Description of reviewed information:

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.

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

3. The TSC has calculated Reactor Vessel Venting Time in accordance with FR-I.3 Attachments 4 and 5 using the following information.

Containment pressure	2.5 psig
Containment temperature	160°F
Containment hydrogen conc	1.0%
RCS pressure	1000 psig

INITIATING CUES:

You are the CRS and the SM has directed you to review the Reactor Vessel Venting Time calculation.

Number:	Title:	Revision Number:
3-FR-I.3	RESPONSE TO VOIDS IN REACTOR VESSEL	0

Attachment 4 (Attachment page 1 of 1)

INSTRUCTIONS FOR DETERMINING VENTING TIME

1. **DETERMINE Containment Volume at STP = A**

$$A = (2.61 \times 10^6 \text{ Ft}^3) \times \frac{P}{14.7 \text{ psia}} \times \frac{492^\circ R}{T}$$

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

$$A = (2.61 \times 10^6 \text{ Ft}^3) \times \frac{17.2}{14.7 \text{ psia}} \times \frac{492^\circ R}{160}$$

A = 9.39×10^6 Ft3

2. **DETERMINE Maximum Hydrogen volume that can be vented = B**

$$B = \frac{(3\% - \text{Containment Hydrogen Concentration}) \times A}{100\%}$$

B = 1.87×10^5 Ft3

3. **DETERMINE Hydrogen flow rate as a function of RCS pressure = C**

a. CHECK RCS pressure.

b. DETERMINE Hydrogen flow rate using Attachment 5, HYDROGEN FLOW RATE VERSUS RCS PRESSURE, Page 29.

C = 2900 SCFM

4. **CALCULATE maximum venting time:**

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

Maximum venting time = 64.7 minutes

-END OF ATTACHMENT-

File:
Task Number:

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Review a Safety Function Determination

JPM Number: SRO-A-2

KA Number and Importance: 1940012237 Equipment Control - Ability to determine operability and/or availability of safety related equipment.
RO – 3.6, SRO – 4.6

Suggested Environment: Classroom

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:

OAP – 34 Safety Function Determination Process
Technical Specifications Section 3.8
Technical Specifications Section 3.5

INITIAL CONDITIONS:

Unit 3 is operating at 100% Power

12 hours ago 32 High Head Safety Injection Pump was taken out of service for bearing replacement and is expected to be returned to service within the next 4 hours. This was the only Active LCO at that time.

5 hours ago 32 EDG was declared in operable due to a failure of its jacket water pressure switch. The jacket water pressure switch continues to blow control power fuses. Return time for the 32 EDG is undetermined. The team has completed all actions of LCO-3.8.1.

The STA prepared a Safety Function Determination in accordance with OAP-34. The STA has determined that the minimum equipment to mitigate an accident is operable and that no loss of safety function exists.

INITIATING CUES:

You are the CRS and the Shift Manager has directed you to review the Safety Function Determination.

TASK STANDARD:

The Safety Function Determination is reviewed and errors identified.

✸ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
	Review Data Entered on Form		
2.	Identify Tech Spec required Supported Systems entered in D	Determine 3.5.2 and 3.8.9 are correct	
3.	Identify Systems supported by the system listed in D above entered in E	Determine 3.7.5, 3.7.8, 3.7.9, 3.7.11, 3.7.13, 3.8.1, 3.8.4, 3.8.7 are correct	
4.	Identify all systems supported by the systems listed in Block E above	Determines 3.4.4, 3.52., 3.7.8, 3.7.12, 3.8.1, 3.8.9 are correct	
5.	Identify any systems redundant to those systems identified in D, E, and F above that are tracked by active LCOs entered in G	Determine 3.5.2 is correct	
6.	Identify systems supported by systems listed in G above entered in H	Determine None is correct	
7.	Identify the systems supported and affected by the systems listed in H Entered in I	Determine None is correct	
8.	Identify redundant systems listed between blocks D, E, & F, and G, H, and I	Determine 3.5.2 is correct	
✸8.	Review the minimum equipment required to mitigate an accident operable	Determine Block K is NOT correct	
✸9.	Review Loss of Safety Function	Determine Loss of Safety Function NOT correct	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
*10.	Do Not Sign Safety Function Determination Form	Does Not sign Form	
	JPM is Complete		

SAFETY FUNCTION DETERMINATION PROCESS	No: OAP-034	Rev: 2
	Page 12 of 37	

ATTACHMENT 1
Safety Function Determination
(Page 1 of 2)

SAFETY FUNCTION DETERMINATION

A. **Inoperable system:** #32 Emergency Diesel Generator
Reference CR Number:
Safety Function(s) (S,C,H,P,Z,I), ref. step 6.3. C, H, Z, I
TS Section(s) 3.8.1

B. **Technical Specification Related:** ☑ Yes ☐ No

C. **Support system:** ☑ Yes ☐ No

D. **List all systems supported by the inoperable system identified above:**

3.5.2
3.8.9

ANSWER KEY

E. **List all systems supported by the systems listed in block D above:**

3.7.5	3.7.13	
3.7.8	3.8.1	
3.7.9	3.8.4	
3.7.11	3.8.7	

F. **List all systems supported by the systems listed in block E above:**

3.4.4	3.8.1	
3.5.2	3.8.9	
3.7.8		
3.7.12		

G. **Review the active LCO Log and list any systems redundant to those systems identified in blocks D, E, & F that are tracked by active LCOs:**

3.5.2

SAFETY FUNCTION DETERMINATION PROCESS	No: OAP-034	Rev: 2
	Page 13 of 37	

ATTACHMENT 1
Safety Function Determination
(Page 2 of 2)

SAFETY FUNCTION DETERMINATION

H. **List the systems supported by the systems listed in block G above:**

NONE

I. **List the systems supported AND affected by the systems listed in block H above:**

NONE

ANSWER KEY

J. **Identify redundant systems listed between blocks D, E, & F AND G. H.& I above:**

3.5.2

K. **Is the minimum equipment required to mitigate an accident operable?** ☑ Yes ☐ No

If the minimum equipment required to mitigate an accident is not operable then a Loss of Safety Function exists.

L. **Does a Loss of Safety Function exist?** ☐ Yes ☑ No — Incorrect

If a Loss of Safety Function exists, then perform the Actions of the LCO in which the Loss of Safety Function exists.

M. **Review/Approval:**

Prepared by: Shift Technical Advisor Signed + Dated

(STA) Name Signature Date

Reviewed by:

SM/CRS/FSS / /

SRO (Current) Name Signature Date

Answer

SAFETY FUNCTION DETERMINATION PROCESS	No: OAP-034	Rev: 2
	Page 9 of 37	

6.2 Minimum Equipment Required –

The minimum number of systems required to be operable to mitigate an accident. The Applicable Safety Analysis section of TS Bases contains information concerning the minimum equipment required to mitigate an accident. The minimum safeguards equipment required to mitigate a design basis accident is (Modes 1 through 4):

- 2 Emergency Diesel Generators
- 2 Safety Injection Pumps
- 1 Residual Heat Removal Pump
- 1 Containment Spray Pump AND 3 Containment Fan Cooler Units

OR

- 2 Containment Spray Pumps AND 0 Containment Fan Cooler Units

OR

- 0 Containment Spray Pumps AND 5 Containment Fan Cooler Units
- 2 Essential Service Water Pumps
- 1 Auto start Auxiliary Feedwater Pump (Motor Driven)
- 1 Non-Essential Service Water Pump
- 1 Component Cooling Water Pump, and
- 1 Recirculation Pump

In Modes 5 and 6, operations are conducted via risk assessment and as specified in the Technical Specification Shutdown Sections. The minimum equipment required is determined based on Technical Specifications, plant status, and plant configuration.

6.3 Safety Function -

A function described or specified in the Technical Specification Bases Section – "Applicable Safety Analysis", FSAR – Chapter 14, Design Basis Documents, or Accident Analysis Design Basis Documents performed by a system, structure, or component (SYSTEM) to mitigate an accident. The critical safety functions are **(S,C,H,P,Z,I)**: sub-criticality, core cooling, heat sink,RCS integrity, containment integrity, and RCS inventory.

Answer

SAFETY FUNCTION DETERMINATION PROCESS	No: OAP-034	Rev: 2
	Page 7 of 37	

4.2.5 REVIEW the active LCOs, to identify any systems that are redundant to those entered in D, E, or F.

4.2.5.1 RECORD these systems in "G" of Attachment 1.

4.2.6 IDENTIFY all systems supported by systems entered in G.

4.2.6.1 RECORD identified systems in "H" of Attachment 1.

4.2.7 IDENTIFY all systems supported by systems entered in H.

4.2.7.1 RECORD these systems in "I" of Attachment 1.

4.2.8 ENTER any redundant systems identified during the evaluation in "J" of Attachment 1.

4.2.9 IF redundant systems have been identified, THEN DETERMINE if the minimum equipment required to mitigate an accident is operable.

4.2.9.1 INDICATE the determination in 'K' of Attachment 1.

4.2.10 IF the minimum equipment required to mitigate an accident is NOT operable or a safety function assumed in the accident analysis can not be performed, THEN a LOSS OF SAFETY FUNCTION exists.

4.2.10.1 INDICATE this determination in "L" of Attachment 1.

4.2.11 IF a LOSS OF SAFETY FUNCTION exists, OR is indeterminate, THEN ENTER LCO 3.0.2 for the ***supported system(s)***.

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIAL CONDITIONS:

Unit 3 is operating at 100% Power

6 hours ago 32 EDG was declared in operable due to a failure of its pre-lube pump. The team has completed all actions of LCO-3.8.1. The pre-lube pump is expected back within the next 6 hours. This is the only Active LCO at time zero.

4 hours ago 31 AFW pump was declared inoperable due to breaker control power fuses continuing to blow.

The STA prepared a Loss of Safety Function Determination in accordance with OAP-34.

INITIATING CUES:

You are the CRS and the Shift Manager has directed you to review the Safety Function Determination.

SAFETY FUNCTION DETERMINATION PROCESS	No: OAP-034 Rev: 2
	Page 12 of 37

ATTACHMENT 1
Safety Function Determination
(Page 1 of 2)

SAFETY FUNCTION DETERMINATION

A. Inoperable system: #32 Emergency Diesel Generator

Reference CR Number:

Safety Function(s) (S,C,H,P,Z,I), ref. step 6.3. C, H, Z, I

TS Section(s) 3.8.1

B. Technical Specification Related: ☑ Yes ☐ No

C. Support system: ☑ Yes ☐ No

D. List all systems supported by the inoperable system identified above:

3.5.2
3.8.9

E. List all systems supported by the systems listed in block D above:

3.7.5	3.7.13	
3.7.8	3.8.1	
3.7.9	3.8.4	
3.7.11	3.8.7	

F. List all systems supported by the systems listed in block E above:

3.4.4	3.8.1	
3.5.2	3.8.9	
3.7.8		
3.7.12		

G. Review the active LCO Log and list any systems redundant to those systems identified in blocks D, E, & F that are tracked by active LCOs:

3.5.2

File:
Task Number:

SAFETY FUNCTION DETERMINATION PROCESS	No: OAP-034	Rev: 2
	Page 13 of 37	

ATTACHMENT 1
Safety Function Determination
(Page 2 of 2)

SAFETY FUNCTION DETERMINATION

H. List the systems supported by the systems listed in block G above:

NONE

I. List the systems supported AND affected by the systems listed in block H above:

NONE

J. Identify redundant systems listed between blocks D, E, & F AND G. H.& I above:

3.5.2

K. Is the minimum equipment required to mitigate an accident operable? ☑ Yes ☐ No

If the minimum equipment required to mitigate an accident is not operable then a Loss of Safety Function exists.

L. Does a Loss of Safety Function exist? ☐ Yes ☑ No

If a Loss of Safety Function exists, then perform the Actions of the LCO in which the Loss of Safety Function exists.

M. Review/Approval:

Prepared by: SRO Technical Advisor Signed & Dated
(STA) Name Signature Date

Reviewed by:
SM/CRS/FSS / /
SRO (Current) Name Signature Date

File:
Task Number:

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Review a Manual Gaseous Rad Waste Release Permit

JPM Number: SRO-A-3

KA Number and Importance: 1940012306 Ability to approve release permits. |
SRO 3.8

Suggested Environment: Classroom

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:
3-SOP-WDS-13 Gaseous Waste Releases

INITIAL CONDITIONS:

Preparations are in progress to release 31 Large Gas Decay Tank

The Tank is currently at 100 psig
Gas Decay Tank Unpressurized Volume 525 Ft^3
Grab Sample Number 35610
Concentration of Noble Gases 1.3 X 10^{-3}
Current Radiation Monitor 27 Reading is 10 µci/sec

The BOP calculated a manual Release Permit

INITIATING CUES:

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

TASK STANDARD:
Release Permit reviewed and errors found.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Review Entered given data	Ensures given data properly entered	
●3.	Calculate Total Activity	Determine Total Activity Not Correct Correct Value 1.31 X 10^5	
4.	Calculate Available Release Rate	Determine Available Release Rate Correct	
5.	Determine Maximum Allowable Release Rate	Determines Maximum Allowable Release Rate is correct	
6.	Check Select Release Rate conservative	Selected release rate is conservative	
7.	Determine associated conservative percent lift setting from Attachment 11	Selected percent lift setting is correct	
●8.	Determine calculated leakrate	Determines Calculated Leakrate NOT correct	
9.	Calculations are not correct	Does Not sign the form	
	JPM Complete		

GASEOUS WASTE RELEASES	No: 3-SOP-WDS-013 Rev: 26
	Page 36 of 55

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

Tank/ System (1) 31L6DT Current Date/Time (2) TODAY (Date) 1600 (Time) Permit No. (3) 17

Volume (4) 525 ft³ Initial Pressure (5) 100 psig Concentration of Noble Gas (C)(6) 1.3X10⁻³ µCi/cc

Grab Sample:(7) ~~Sample #~~ 35610 Date TODAY Time 1605 OR R-12 Monitor

Activity (A)(8) (1.16X10⁵) 1.31X10⁵ µCi Noble Gas Iodine 131 Activity (8a) NA µCi/cc

15.9 VC Purge Only

Calculated Release Rate (R)(9) (12.3) µCi/sec Available Release Rate (D)(10) 3.01X10³ µCi/sec

---

Discharge Monitor (11) 27 Actual Alarm Setpoint (12) 3.08X10³ µCi/sec

Calculated alarm setpoint (13) NA µCi/sec Alert setpoint (14) _____ µCi/sec

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

IF discharge monitor is OOS, THEN COMPLETE the following:

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

Release Calculations verified by (22) NA

Release Path Valve Alignment Verified (23) _____ CRS/SM

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

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

Calculations Results: S (28) _____ Emax (29) 5603 ft³/min

E(30) 26 ft³/min RCV-014 Setting (31) 40 % open

Comments:(32) _____

File: 2000181602-1
Task Number: 2000180102

Difficulty: 3
3-SOP-WDS-13

Time: 15 minutes
Administrative

Review a Manual Gaseous Rad Waste Release Permit

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIAL CONDITIONS:

Preparations are in progress to release 31 Large Gas Decay Tank

The Tank is currently at 100 psig
Gas Decay Tank Unpressurized Volume 525 Ft^3
Grab Sample Number 35610
Concentration of Noble Gases 1.3 X 10^{-3}
Current Radiation Monitor 27 Reading is 10 µci/sec

The BOP calculated a manual Release Permit

INITIATING CUES:

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

GASEOUS WASTE RELEASES	No: 3-SOP-WDS-013 Rev: 26
	Page 36 of 55

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

Tank/ System (1) 31LGDT Current Date/Time (2) TODAY (Date) 1600 (Time) Permit No. (3) 17

Volume (4) 525 ft³ Initial Pressure (5) 100 psig Concentration of Noble Gas (C)(6) 1.3×10^{-3} µCi/cc

Grab Sample:(7) Sample # 35610 Date TODAY Time 1605 OR R-12 Monitor

Activity (A)(8) 1.16×10^{5} µCi Noble Gas Iodine 131 Activity (8a) NA µCi/cc VC Purge Only

Calculated Release Rate (R)(9) 12.3 µCi/sec Available Release Rate (D)(10) 3.07×10^{3} µCi/sec

---

Discharge Monitor (11) 27 Actual Alarm Setpoint (12) 3.08×10^{3} µCi/sec

Calculated alarm setpoint (13) NA µCi/sec Alert setpoint (14) _____ µCi/sec

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

IF discharge monitor is OOS, THEN COMPLETE the following:

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

Release Calculations verified by (22) NA

Release Path Valve Alignment Verified (23) _____ CRS/SM

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

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

Calculations Results: S (28) _____ Emax (29) 5003 ft³/min

E(30) 26 ft³/min RCV-014 Setting (31) 40 % open

Comments:(32) _____

File:
Task Number:

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Classify E-Plan Event and Complete Part 1 Form

JPM Number: SRO A-4

KA Number and Importance: 1940012441 Emergency Procedures/Plan - Knowledge of the emergency action level thresholds and classifications.
SRO – 4.6

Suggested Environment: Classroom

Actual Testing Environment:

Alternate Path: NO

Time Critical: YES

Estimated Time: **Actual Time: _____**

References:

IP-EP-120 Emergency Classification
IP-EP-115 Emergency Plan Forms
IP-EP-210 Central Control Room

This is a TIME CRITICAL JOB PERFORMANCE MEASURE.

YOU HAVE 15 MINUTES FROM THE TIME YOU ARE TOLD TO BEGIN UNTIL YOU CLASSIFY THE EVENT

YOU HAVE 15 MINUTES FROM THE TIME YOU CLASSIFY THE EVENT UNTIL YOU COMPLETE THE RADIOLOGICAL EMERGENCY DATA FORM.

INITIAL CONDITIONS:

The Reactor and Turbine have tripped. Safety Injection automatically initiated due to a large break LOCA inside containment.

The following plant conditions exist:

- The team is responding in E-0, Reactor Trip or Safety Injection.
- Containment Isolation Phase A and B have been confirmed.
- 31 and 32 Containment Spray Pumps failed to start and attempts to start pumps was unsuccessful.
- 34 Containment Fan Cooler Unit was inoperable prior to the event due to circuit breaker maintenance
- Containment Pressure is 38 psig and stable
- R-25 reading 19 R/hr and R-26 reading 21 R/hr
- RVLIS, Natural Circ Range reading 44%

METEOROLOGICAL CONDITIONS:

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

The Shift Manager is unable to get back to the control room.
The MIDAS Computer is out of service for maintenance.

INITIATING CUES:

You are the CRS and you must classify the event and complete the required Radiological Emergency Data Form as required by the Emergency Plan.

TASK STANDARD:

Emergency Event properly classified and Emergency Data Form Part 1 properly completed.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
●2.	The SM shall evaluate Plant Status Sheet to determine IF a GE, SAE, ALERT or NUE classification applies, AND IF so, determine the highest classification and declare it. **Note: Declaration must be made within 15 minutes of start of JPM** **Time Declaration Made: _____**	**EAL (4.1.4)** **GENERAL**	
●3.	Complete and Approve "New York State Radiological Emergency Data Form, Part 1" **Note: MUST BE COMPLETED WITHIN 15 MINUTES OF DECLARATION** Obtain filled out Radiological Emergency Data Form, Part "1" from MEANS and retain as part of JPM package. **Time IP-EP-115 Form 1 completed:** _____	Complete IP-EP-115 Form 1 Verify Data using Radiological Emergency Data Form Information, item #s 4, 5, 7, 8 11, 12 &13	
4.	Refer to procedure IP-EP-210, Attachment 9.1 (SM / POM / ED Checklist)	Attach 9.1	
5.	Initiate County, State and NRC notification per IP-EP-115, Form EP-4, 5 or 6 as applicable **CUE:** Acknowledge as communicator when requested to commence notifications.	Request for CCR comunicator	

Classify E-Plan Event and Complete Part 1 Form

New York State

Indian Point Energy Center
RADIOLOGICAL EMERGENCY DATA FORM - PART 1 Notificatio

This is the Indian Point Energy Center with a Part 1 Notification on: TODAY

1. Reactor Status:
This is an: (EXERCISE) ACTUAL EMERGENCY at: UNIT 2 (UNIT 3) BOTH UN
Unit 2 (Operational) Shutdown (Date)_____ (Time)_____ (24 hr cloc
Unit 3 Operational (Shutdown) (Date) TODAY (Time) CURRENT TIME (24 hr clock

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

3.* EAL#: 4.1.4 Confirmed Phase "B" isolation signal following conf
LOCA with less than minimum containment cooling safeguards equipm
operating Table 4.3
AND
Any indicators of fuel clad loss, Table 4.1

4. Release of Radioactive Materials due to the Classified Event: A
(A. No Release) * B. Release BELOW Federal limits To Atmosphere To Water
C. Release ABOVE Federal limits To Atmosphere To Water D. Unmonitored release requiring evalua

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

6. Wind Direction: (From) 120 Degrees at elevation 10 meters

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

8. 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
All remaining Areas MONITOR the EMERGENCY ALERT SYSTEM
* (2 miles around 5-miles downwind) 5 miles around 10-miles downwind Entire EPZ
* In the following Sectors: (1) (2) (3) 4 5 6 7 8 9 10 11 12 13 14 15 (16)
NOTE: OFFSITE AUTHORITIES SHOULD CONSIDER SHELTER-IN-PLACE + TAKE KI IF EVACUATION IS NOT FEASIBLE

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

10.* Emergency Director Approval: Signature Date/Time: TODAY CURRENT TIM
(Director's Name)

Answer Key

File:
Task Number:

Difficulty:
Procedure Ref

Time: minutes
category

Classify E-Plan Event and Complete Part 1 Form

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

File:
Task Number:

Difficulty:
Procedure Ref

Time: minutes
category

This is a TIME CRITICAL JOB PERFORMANCE MEASURE.

YOU HAVE 15 MINUTES FROM THE TIME YOU ARE TOLD TO BEGIN UNTIL YOU CLASSIFY THE EVENT

YOU HAVE 15 MINUTES FROM THE TIME YOU CLASSIFY THE EVENT UNTIL YOU COMPLETE THE RADIOLOGICAL EMERGENCY DATA FORM.

INITIAL CONDITIONS:

The Reactor and Turbine have tripped. Safety Injection automatically initiated due to a large break LOCA inside containment.

The following plant conditions exist:

- The team is responding in E-0, Reactor Trip or Safety Injection.
- Containment Isolation Phase A and B have been confirmed.
- 31 and 32 Containment Spray Pumps failed to start and attempts to start pumps was unsuccessful.
- 34 Containment Fan Cooler Unit was inoperable prior to the event due to circuit breaker maintenance
- Containment Pressure is 38 psig and stable
- R-25 reading 19 R/hr and R-26 reading 21 R/hr
- RVLIS, Natural Circ Range reading 44%

METEOROLOGICAL CONDITIONS:

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

The Shift Manager is unable to get back to the control room.
The MIDAS Computer is out of service for maintenance.

INITIATING CUES:

You are the CRS and you must classify the event and complete the required Radiological Emergency Data Form as required by the Emergency Plan.

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Calculate a Power Reduction Reactivity Plan per POP-2.1

JPM Number: RO A-1-1

**KA Number and Importance: 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. |
RO 3.9**

Suggested Environment: Classroom

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:

2-POP-2.1 Operations at Greater than 45% Power

INITIAL CONDITIONS:

- The Beacon Computer is out of service for maintenance.
- The plant has been operating at 100% power (1080 MWe) for 175 days following a refueling outage.
- 32 Heater Drain Pump must be removed from service to repair a valve packing leak.
- The SM has directed a power reduction to 700 MWe in 3 hours to remove the heater drain pump.

Current RCS Boron Concentration is 1200 ppm
Current Control Bank D position 230 Steps

INITIATING CUES:

You are the ATC and the CRS has directed you to perform a Power Reduction Reactivity calculation using Attachment 5 of 3-POP-2.1.

TASK STANDARD:

Attachment 5 of POP-2.1 complete.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain current copy of 3-POP-2.1	Candidate will be given the procedure	
●3.	Enter Total MW change	Enters 380 MW	
●4.	Enter Rate of Shutdown	Enters approx 127 (± 1)	
5.	Enter Start Time	Enters Current Time	
6.	Enter End Time	Enters Start Time + 3 hours.	
●7.	Determine Power Defect from Graph RV-1	Enter 400 (± 5) pcm	
●8.	Determine Xenon Worth from Graph 3D	Enter 22 (± 3) pcm	
●9.	Calculate total of steps 2 & 3	Enter 378 (± 8) pcm	
●10.	Enter Target Rod Position	Enter 186 (± 1) steps	
●11.	Enter Integral Rod Worth at 186 steps	Enter 91 (± 3.5) pcm	
●12.	Enter Current Rod Position	Enter 230 Steps	
●13.	Enter Integral Rod Worth at 230 Steps	Enter 0 pcm	
●14.	Calculate Reactivity due to rods	Enter 91 (note this is a negative number)	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
●15.	Calculate Reactivity needed from Boric Acid	Sum Steps 4 & 5 Enter 287 (± 10) pcm	
●16.	Calculate the total amount of boric acid needed. Step 6 ÷-2.03 pcm/gal	Enter 141 (± 10)	
	JPM Complete.		

OPERATION AT GREATER THAN 45% POWER	No: 3-POP-2.1 Rev: 53
	Page 35 of 40

ATTACHMENT 5
POWER REDUCTION REACTIVITY WORKSHEET
(Page 1 of 2)

NOTE

- The preferred reactivity calculation for planned power reductions is the Beacon Summary provided by Reactor Engineering
- This worksheet serves as an alternate method for reactivity calculations

ANSWER KEY

1.0 RECORD the following:

Total MW Change	380
Rate of S/D	127 MW/hr
Start Time	Current Time
End Time	Current Time + 3hrs

2.0 DETERMINE Power Defect from 3-GRAPH-RV-1 OR the daily reactivity sheet.

(+) 400 (±5) pcm

3.0 DETERMINE Xenon worth as follows:

3.1 IF Xenon equilibrium is established
AND 3-GRAPH-RV-3D has current cycle data,
THEN USE 3-GRAPH-RV-3D.

3.2 IF Xenon equilibrium is NOT established,
OR 3-GRAPH-RV-3D does NOT have current cycle data,
THEN REQUEST Xenon worth from Reactor Engineering

(-) 22 (±3) pcm

4.0 CALCULATE the total of Steps 2 and 3.

400 (Step 2) + -22 (Step 3) = (+) 378 (±8) pcm

OPERATION AT	No: 3-POP-2.1	Rev: 53
GREATER THAN 45% POWER	Page 36 of 40	

ATTACHMENT 5
POWER REDUCTION REACTIVITY WORKSHEET
(Page 2 of 2)

5.0 DETERMINE Reactivity due to control rods using 3-GRAPH-RV-13 AND 3-GRAPH-RV-7B.

	Control Rod Position		Integral Rod Worth	
Target Rod Position	186 (±1)	Steps	91 (±3.5)	pcm
Current Rod Position	230	Steps	- 0	pcm
			(-) 91	pcm

6.0 CALCULATE the Reactivity needed from Boric Acid by summing Steps 4 and 5.

378 + (-) 91 = (+) 278 (±10) pcm

Step 4 Step 5

7.0 CALCULATE the total amount of Boric Acid needed.

279 pcm / 2.03 pcm/gal = 141 (±10) gal

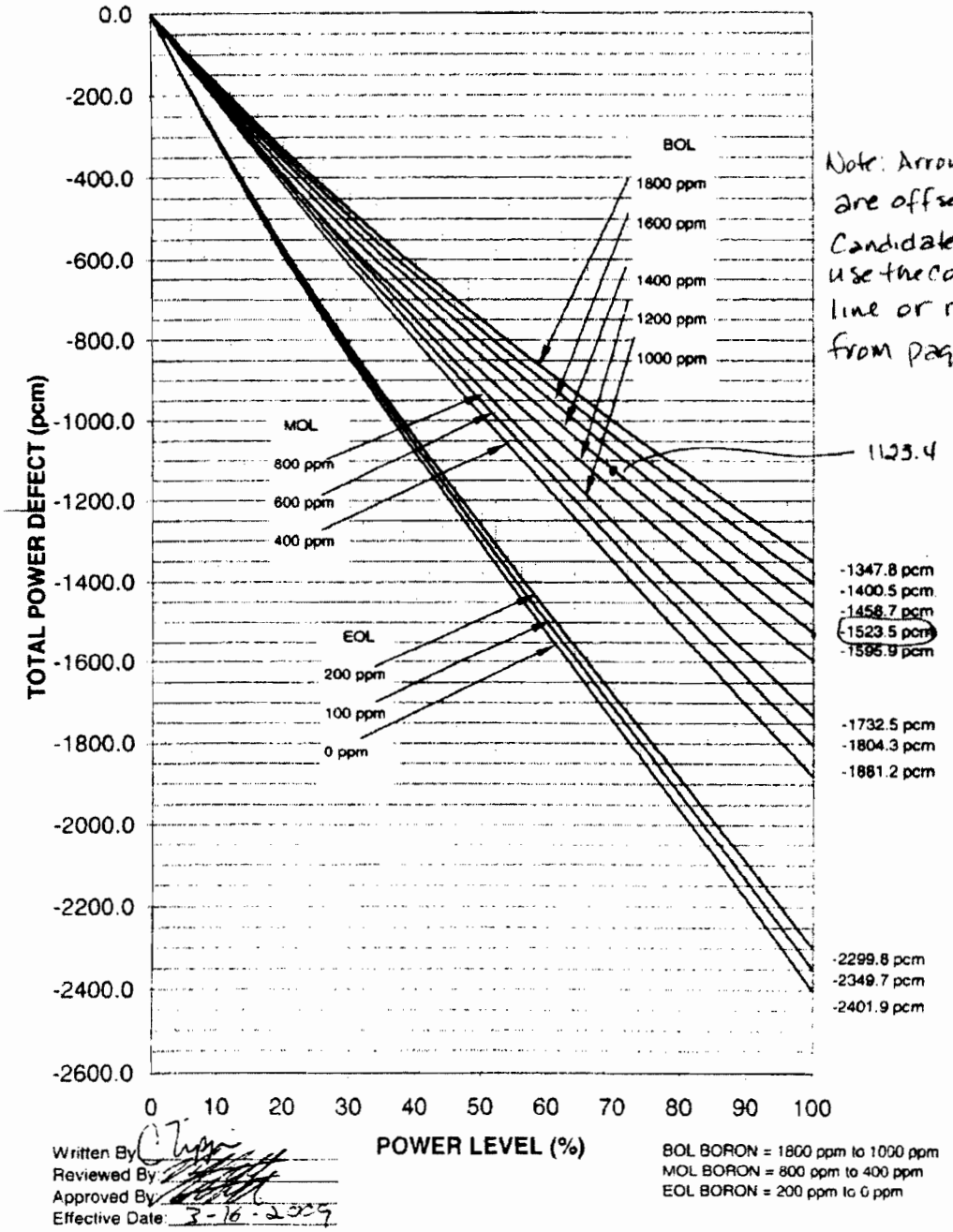
Step 6 (from 3-GRAPH-RV-14, Reactivity Control Parameters, OR Reactor Engineering)

ANSWER KEY

CONTROLLED

ANSWER KEY

3-GRAPH-RV-1 Rev 20
TOTAL POWER DEFECT
(for use with 3-SOP-RPC-003)
CYCLE 16 (Page 1 of 2)



Note: Arrows are offset. Candidate must use the correct line or number from page 2

1123.4

Written By: C Thomas
Reviewed By:
Approved By:
Effective Date: 3-16-2009

BOL BORON = 1800 ppm to 1000 ppm
MOL BORON = 800 ppm to 400 ppm
EOL BORON = 200 ppm to 0 ppm

ANSWER KEY

3- GRAPH-RV-1 Rev 20
TOTAL POWER DEFECT
(for use with 3-SOP-RPC-003)
CYCLE 16 (Page 2 of 2)

POWER (%)	BOL					MOL					EOL				
	RCS BORON CONCENTRATION (ppm)														
	1000	1200	1400	1600	1800	400	600	800	0	100	200
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	-106.6	-100.2	-95.0	-90.7	-87.1	-108.6	-104.0	-101.8	-159.9	-157.0	-154.4
10	-207.3	-195.5	-185.7	-177.7	-170.9	-214.2	-207.2	-200.9	-310.7	-305.3	-300.2
15	-302.9	-286.4	-272.7	-261.2	-251.5	-317.1	-306.8	-297.4	-453.6	-445.8	-438.4
20	-394.0	-373.4	-356.2	-341.7	-329.3	-417.6	-404.2	-391.8	-588.6	-579.5	-569.9
25	-481.4	-457.2	-436.8	-419.5	-404.6	-516.2	-499.5	-484.1	-719.7	-707.4	-695.7
30	-565.6	-538.1	-514.8	-494.9	-477.6	-613.0	-593.1	-574.6	-844.7	-830.2	-816.5
35	-647.2	-616.6	-590.5	-568.1	-548.6	-708.4	-685.2	-663.6	-965.5	-948.9	-933.0
40	-726.5	-693.0	-664.3	-639.5	-617.7	-802.5	-775.9	-751.1	-1082.8	-1064.0	-1046.1
45	-804.0	-767.7	-736.3	-709.1	-685.1	-895.5	-865.4	-837.4	-1197.3	-1176.2	-1156.2
50	-880.1	-840.9	-807.0	-777.3	-751.0	-987.7	-954.0	-922.6	-1309.6	-1286.3	-1264.0
55	-955.0	-912.9	-876.3	-844.2	-815.6	-1079.2	-1041.7	-1006.8	-1420.3	-1394.6	-1370.0
60	-1028.9	-983.9	-944.5	-909.9	-878.9	-1170.0	-1128.7	-1090.1	-1529.9	-1501.7	-1474.7
65	-1102.2	-1054.0	-1011.8	-974.5	-941.1	-1260.4	-1215.0	-1172.7	-1638.8	-1607.9	-1578.5
70	-1174.7	-1123.3	-1078.2	-1038.1	-1002.1	-1350.3	-1300.7	-1254.5	-1747.3	-1713.7	-1681.6
75	-1246.7	-1192.0	-1143.7	-1100.8	-1062.2	-1439.8	-1385.9	-1335.7	-1855.8	-1819.3	-1784.4
80	-1318.1	-1259.9	-1208.5	-1162.6	-1121.3	-1529.0	-1470.6	-1416.3	-1964.4	-1924.9	-1887.2
85	-1388.9	-1327.2	-1272.4	-1223.5	-1179.4	-1617.7	-1554.9	-1496.2	-2073.2	-2030.7	-1990.0
90	-1458.9	-1393.6	-1335.5	-1283.5	-1236.6	-1706.1	-1638.6	-1575.6	-2182.4	-2136.7	-2083.0
95	-1528.0	-1459.1	-1397.6	-1342.5	-1292.7	-1793.9	-1721.7	-1654.4	-2292.0	-2243.0	-2196.3
100	-1595.9	-1523.5	-1458.7	-1400.5	-1347.8	-1881.2	-1804.3	-1732.5	-2401.9	-2349.7	-2299.8

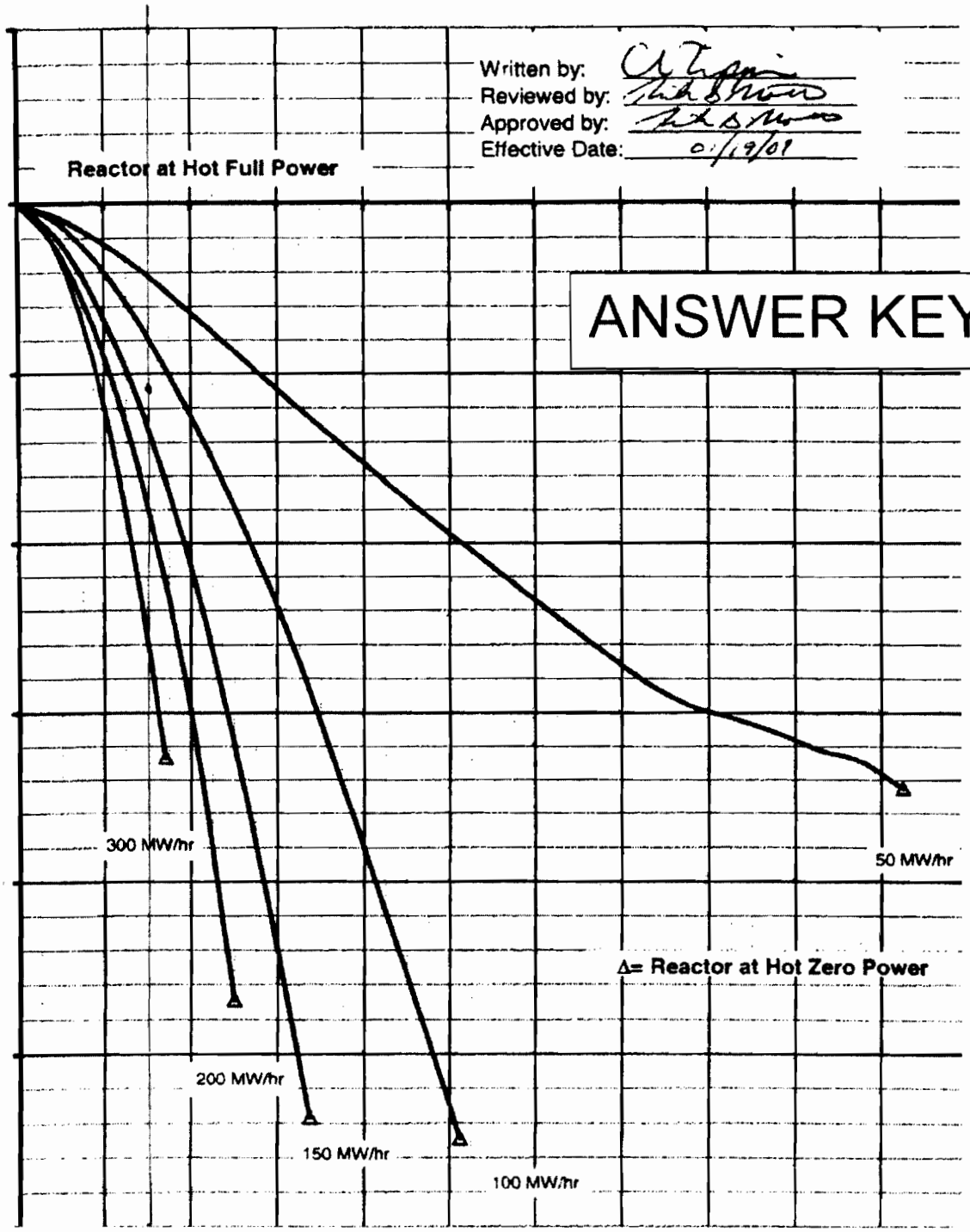
Written By: C. [signature]
Reviewed By: [signature]
Approved By: [signature]
Effective Date: 3-16-2009

ANSWER KEY

File: 2000771601-1.doc
Task Number: 2000770101

Difficulty: 3
2-POP-2.1

Time: 20 minutes
Administrative


Written by:
Reviewed by:
Approved by:
Effective Date: 01/19/01
Reactor at Hot Full Power
ANSWER KEY
300 MW/hr
200 MW/hr
150 MW/hr
100 MW/hr
50 MW/hr
Δ= Reactor at Hot Zero Power

ANSWER KEY

CONTROLLED

File: 2000771601-1.doc
Task Number: 2000770101

Difficulty: 3
2-POP-2.1

Time: 20 minutes
Administrative

3-GRAPH-RV-7B Rev.11
AT POWER CONTROL BANK WORTH AS A FUNCTION OF BANK POSITION
CYCLE 16 (For Use with POP-2.1)
EQUILIBRIUM XENON CONDITIONS
(Page 1 of 2)

BANK POSITION Steps Withdrawn		BOL 150 MWD/MTU		BOL/MOL 6000 MWD/MTU		MOL 12000 MWD/MTU		MOL/EOL 18000 MWD/MTU		EOL 25017 MWD/MTU	
BANK C	BANK D	Differential Rod Worth (pcm/step)	Integral Rod Worth (pcm)	Differential Rod Worth (pcm/step)	Integral Rod Worth (pcm)	Differential Rod Worth (pcm/step)	Integral Rod Worth (pcm)	Differential Rod Worth (pcm/step)	Integral Rod Worth (pcm)	Differential Rod Worth (pcm/step)	Integral Rod Worth (pcm)
230	230	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00
230	227	0.52	3.11	0.29	1.43	0.32	1.58	0.51	2.54	1.05	4.66
230	224	1.24	6.22	0.57	2.85	0.63	3.16	1.02	5.08	1.81	9.33
230	220	2.07	10.37	0.95	4.75	1.05	5.26	1.69	8.46	2.83	15.54
230	218	2.36	15.97	1.20	7.91	1.36	8.92	2.15	14.14	3.43	24.22
230	215	2.80	24.36	1.58	12.64	1.83	14.40	2.84	22.66	4.34	37.20
230	212	3.24	32.76	1.95	17.37	2.29	19.89	3.53	31.18	5.24	50.24
230	210	3.53	38.36	2.20	20.52	2.60	23.55	3.99	36.86	5.85	58.91
230	206	3.56	52.62	2.47	30.65	3.01	35.98	4.52	55.48	6.35	84.80
230	203	3.58	63.31	2.66	38.25	3.31	45.31	4.92	69.45	6.72	104.22
230	200	3.60	74.00	2.86	45.84	3.62	54.64	5.33	83.42	7.10	123.63
230	197	3.60	84.78	3.01	55.18	3.79	66.38	5.46	100.06	7.10	144.95
230	194	3.59	95.56	3.16	64.51	3.97	78.11	5.59	116.71	7.11	166.27
230	190	3.59	109.94	3.36	76.96	4.21	93.76	5.77	138.90	7.12	194.70
230	188	3.57	117.02	3.42	83.97	4.26	102.42	5.75	150.34	7.02	208.45
230	185	3.54	127.63	3.51	94.49	4.33	115.39	5.72	167.49	6.88	229.06
230	182	3.51	138.24	3.59	105.00	4.40	128.37	5.69	184.65	6.73	249.71
230	180	3.49	145.31	3.65	112.02	4.44	137.03	5.67	196.09	6.64	263.47
230	176	3.46	159.13	3.73	127.04	4.48	155.00	5.58	218.32	6.47	289.19
230	173	3.44	169.49	3.80	138.30	4.51	168.48	5.51	234.99	6.35	308.48
230	170	3.42	179.84	3.86	149.57	4.54	181.96	5.45	251.66	6.22	327.78
230	167	3.41	190.06	3.92	161.43	4.56	195.66	5.38	267.68	6.13	346.00
230	164	3.40	200.27	3.97	173.29	4.57	209.35	5.32	283.70	6.05	364.23
230	160	3.39	213.88	4.05	189.11	4.59	227.62	5.23	305.07	5.93	388.53

Written By: _____
Reviewed By: _____
Approved By: _____
Effective Date: 3-16-2009

Total Control Bank Worth
BOL = 3635 pcm EOL = 3996 pcm
Total Shutdown Bank Worth
BOL = 4096 pcm EOL = 4485 pcm

ANSWER KEY

CONTROLLED

3-GRAPH-RV-14 Rev. 3
REACTIVITY CONTROL PARAMETERS
IP3 Cycle 16

	BOL	6000 MWD/MTU	MOL	EOL
Cycle Burnup (MWD/MTU) =	150	6000	12000	25017
Specified Boron Concentration (ppm) =	974	1194	1005	100
Relative Power (%) =	100	100	100	100
Moderator Temperature Coefficient (pcm/F) =	-12.9	-10.9	-15.1	-29.8
Isothermal Temperature Coefficient (pcm/F) =	-14.6	-12.7	-17.2	-33.1
Moderator Temperature Defect (pcm) =	-221.9	-173.9	-252.8	-557.6
Doppler Power Coefficient (pcm/% power) =	-8.9	-8.6	-8.8	-8.9
Doppler Temperature Coefficient (pcm/F) =	-1.3	-1.3	-1.4	-1.4
Doppler Power Defect (pcm) =	-1177.2	-1177.3	-1221.0	-1173.8
Total Power Coefficient (pcm/% power) =	-13.8	-12.6	-14.7	-21.3
Total Power Defect (pcm) =	-1606.0	-1440.3	-1663.8	-2349.7
Axial Reactivity Redistribution Defect (pcm) =	-206.8	-89.1	-190.0	-618.3
Control Banks Differential Rod Worth - C bank and D bank (pcm/step) =	4.7	5.0	5.2	6.6
Control Bank D Average Differential Rod Worth - 100 to 223 steps (pcm/step) =	3.1	3.4	3.7	5.4
Control Bank D Power Worth (steps/%) =	-4	-4	-4	-4
Highest Worth Stuck Rod (pcm) =	948 (N-11)			762 (K-10)
Dropped Rod Worth (pcm) =	100.0	100.0	100.0	100.0
Differential Boron Worth (pcm/ppm) =	-6.316	-6.289	-6.687	-8.199
Boration (using 12.5 % Boric Acid) (gal/ppm) =	3.1	3.1	3.1	3.0
Dilution (Pure Makeup Water) (gal/ppm) =	66	54	64	645
Boron Dilution Worth (pcm/gal) =	-0.096	-0.116	-0.104	-0.013
Boration Worth (pcm/gal) =	-2.04	-2.03	-2.16	-2.73
Dilution Differential Power Worth (No Rod Motion) (gal/%) =	144	108	141	1675
Boration Differential Power Worth (No Rod Motion) (gal/%) =	6.8	6.2	6.8	7.8

Other Parameters

Pressurizer Level: Hot ~ 75 gal/%
Cold ~ 125 gal/%
1°F ΔT ∝ 1% Δ Level

Pressurizer Pressure: 1% Δ Pzr Level ∝ 10# Δ Press
1°F Δ Tavg ∝ 100# Δ Press when solid

Steam Dump Steam Flow: ~ 3.75% Steam Flow/°F
Temp. Error Above 5°F Dead Band

Using the above information, other control parameters can easily be derived if the desired units are known. Linear interpolation of the above data for other times in core life (a particular core burnup) can be performed and obtain good accuracy. Reference: Cycle 16 NuPOP Rev. 0 (WCAP-17050-P). Hot full power, all rods out conditions are assumed in the above.

Written By: [signature]
Reviewed By: [signature]
Approved By: [signature]
Effective Date: 3-16-2009

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

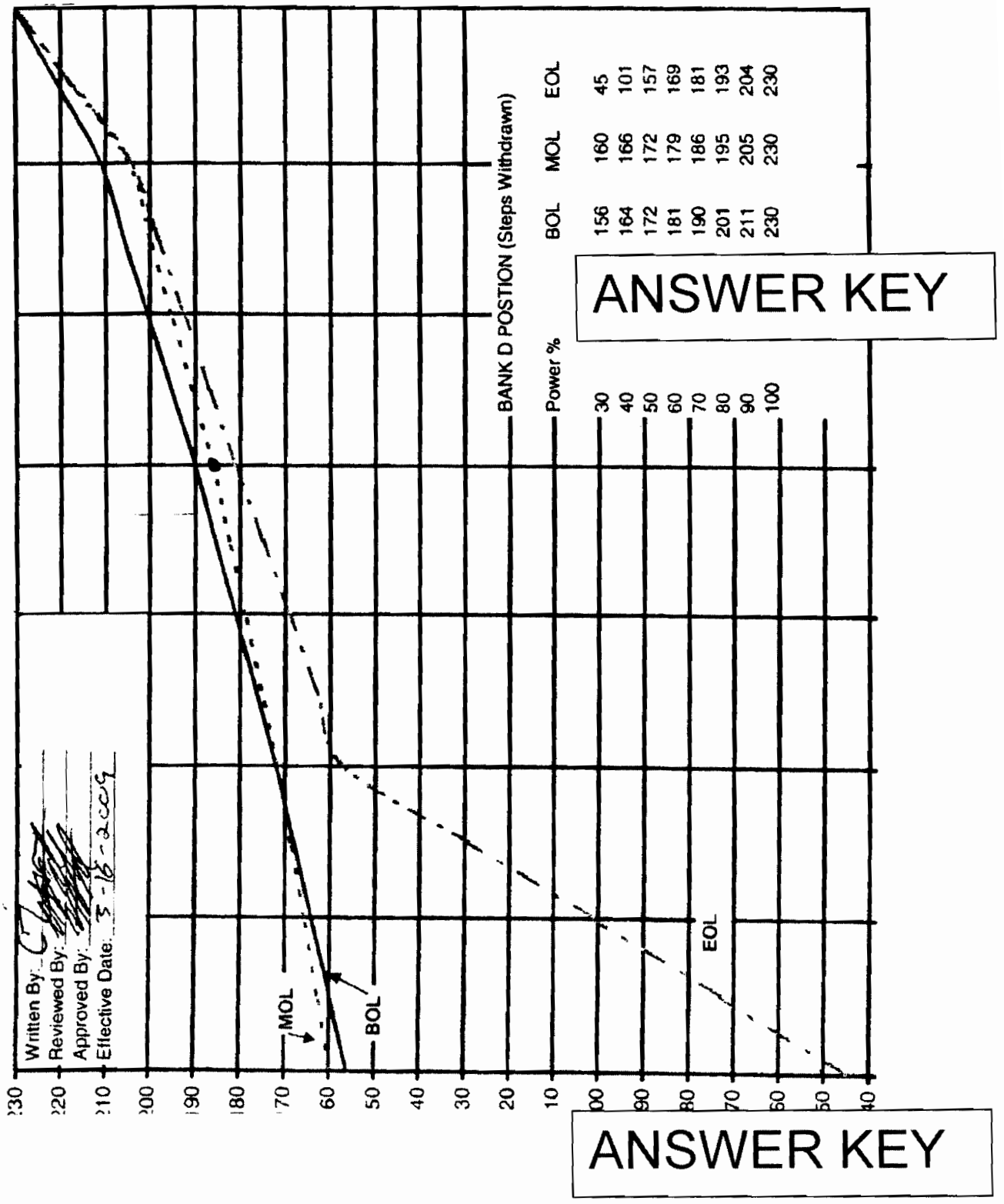
INITIAL CONDITIONS:

- The Beacon Computer is out of service for maintenance.
- The plant has been operating at 100% power (1080 MWe) for 175 days following a refueling outage.
- 32 Heater Drain Pump must be removed from service to repair a valve packing leak.
- The SM has directed a power reduction to 700 MWe in 3 hours to remove the heater drain pump.

Current RCS Boron Concentration is 1200 ppm
Current Control Bank D position 230 Steps

INITIATING CUES:

You are the ATC and the CRS has directed you to perform a Power Reduction Reactivity calculation using Attachment 5 of 3-POP-2.1.


ANSWER KEY
BANK D POSTION (Steps Withdrawn)
Power %
BOL MOL EOL
156 160 45
164 166 101
172 172 157
181 179 169
190 186 181
201 195 193
211 205 204
230 230 230
30 40 50 60 70 80 90 100
MOL
BOL
EOL
Written By:
Reviewed By:
Approved By:
Effective Date: 3-16-2009
ANSWER KEY

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Review Reactor Vessel Venting Time Calculation per FR-I.3

JPM Number: RO A – 1–2

KA Number and Importance: 2.1.25 Conduct of Operations - Ability to interpret reference materials such as graphs, curves, tables etc.
RO – 3.9

Suggested Environment: Classroom

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:
3-FR-I.3 Response to Voids in Reactor Vessel

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.

Containment pressure	2.5 psig
Containment temperature	160°F
Containment hydrogen conc	1.0%
RCS pressure	1000 psig

INITIATING CUES:

You are the ATC and the CRS has directed you to perfom the Reactor Vessel Venting Time calculation in accordance with FR-I.3 Attachments 4 & 5.

TASK STANDARD:

Calculation reviewed and errors identified.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain Current Rev of Procedure	Candidate will be given procedure	
●3	Determine Containment Volume at STP (A)	Calculates 2.40E6 to 2.45E6	
●4	Determine Maximum Hydrogen volume that can be vented (B)	Calculate 4.845E4 to 5.0E4	
●5	Determine Hydrogen flow rate as a function of RCS pressure (C)	2800 to 2950	
●6	Calculate maximum venting time	Calculate 15 to 18 minutes	
	JPM Complete		

Number:	Title:	Revision Number:
3-FR-I.3	RESPONSE TO VOIDS IN REACTOR VESSEL	0

Attachment 4 (Attachment page 1 of 1)
INSTRUCTIONS FOR DETERMINING VENTING TIME

1. **DETERMINE Containment Volume at STP - A**

$$A = (2.61 \times 10^6 \text{ Ft}^3) \times \frac{P}{14.7 \text{ psia}} \times \frac{492^\circ R}{T}$$

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

$$A = (2.61 \times 10^6 \text{ Ft}^3) \times \frac{\quad}{14.7 \text{ psia}} \times \frac{492^\circ R}{620}$$

A = 2.42×10^6 Ft3

2. **DETERMINE Maximum Hydrogen volume that can be vented - B**

$$B = \frac{(3\% - \text{Containment Hydrogen Concentration}) \times A}{100\%}$$

B = 4.84×10^4 Ft3

3. **DETERMINE Hydrogen flow rate as a function of RCS pressure - C**

a. CHECK RCS pressure.

b. DETERMINE Hydrogen flow rate using Attachment 5, HYDROGEN FLOW RATE VERSUS RCS PRESSURE, Page 29.

C = 2900 SCFM

4. **CALCULATE maximum venting time:**

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

Maximum venting time = 16.6 minutes

Answer Key

-END OF ATTACHMENT-

File: 0001251601-1.doc
Task Number: 0001250501

Difficulty: 2
3-FR-I.3

Time: 15 minutes
Administrative

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

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.

Containment pressure	2.5 psig
Containment temperature	160°F
Containment hydrogen conc	1.0%
RCS pressure	1000 psig

INITIATING CUES:

You are the ATC and the CRS has directed you to perfom the Reactor Vessel Venting Time calculation in accordance with FR-I.3 Attachments 4 & 5.

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Perform a Peer Review of a Surveillance Test

JPM Number: RO – A – 2

KA Number and Importance: 1940012212 Equipment Control - Knowledge of surveillance procedures.
RO – 3.7

Suggested Environment: Classroom

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:

3-PT-Q092B 32 Service Water Pump
IP-SMM-DC-904 Surveillance Test Program

INITIAL CONDITIONS

It is 0200 today.
3-PT-Q092B 32 Service Water Pump Quarterly Test was completed.

INITIATING CUES:

You are the Spare RO and the CRS has directed you to perform a Peer Review of the Surveillance Test in accordance with IP-SMM-DC-904.

TASK STANDARD:

Surveillance Test Reviewed and Errors Identified.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain current copy of IP-SMM-904 CUE: Candidate given procedure		
	Document Review on Attachment 10.2		
3.	Calibration due dates recorded	Identifies dates recorded	
4.	Instruments within calibration	Identifies dates within calibration	
5.	Changes documented by TPC	Identifies NA	
6.	All required procedural steps completed	Identifies step 4.2.7 NOT signed off	
7.	All steps NOT completed noted & explained in Comments Section	Identifies step 4.2.7 not signed off	
8.	All corrections lined out, dated and initialed	Identifies correction on page 12 is correctly lined out, dated and initialed	
9.	All Calculations Correct NOTE: On page 14 data is incorrectly transcribed. The calculation is correct; however it is OOS	Identifies calculations correct	
10.	All data properly transcribed	Identifies pump discharge pressure not properly transcribed from page 12 to page 14	
11.	Required CRs, WOs, PFs, or CTSs etc initiated	Identifies NA	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
12.	Operability conclusions correct	Identifies conclusions correct for the corrected data on page 12.	
13.	Overall acceptance conclusions correct	Identifies conclusions correct for the corrected data on page 12.	
	JPM Complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIAL CONDITIONS

It is 0200 today.
3-PT-Q092B 32 Service Water Pump Quarterly Test was completed.

INITIATING CUES:

You are the Spare RO and the CRS has directed you to perform a Peer Review of the Surveillance Test in accordance with IP-SMM-DC-904.

File:
Task Number:

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Perform a SG Tube Leak Determination using 3-AOP-SG-1

JPM Number: RO – A-3

KA Number and Importance: 2.3.14 Radiological Controls - Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. RO – 3.4

Suggested Environment: Classroom

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:

3-AOP-SG-1 Steam Generator Tube Leak

INITIAL CONDITIONS:

Radiation Monitor 15 is in alert.
The operating crew is responding in accordance with 3-AOP-SG-1 Steam Generator Tube Leak.

Given the attached Leakrate Log

INITIATING CUES:

You are the BOP and the CRS has directed you to estimate the SG Tube Leakage.

TASK STANDARD:

SG Tube Leakage calculated using 3-AOP-SG-1 Attachment 1.

✸ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
✸2.	Enter data	Candidate may use Attachment 1 or separate paper	
✸3.	Calculate average R-63	Determines Average R-63 is 1.49 X 10^{-2} µci/cc	
✸4.	Calculate SG Tube Leakage	Determines SG Tube Leakage is 15.36 ±0.3 GPD	
	JPM Complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIAL CONDITIONS:

Radiation Monitor 15 is in alert.
The operating crew is responding in accordance with 3-AOP-SG-1 Steam Generator Tube Leak.

Given the attached Leakrate Log

INITIATING CUES:

You are the BOP and the CRS has directed you to estimate the SG Tube Leakage.

Page 1 of 1

- If leak rate is unknown, take data every 15 minutes until leak rate is determined.
- If leak is ≥ 75 gpd, take data every 15 minutes.
- If leak ≥ 30 gpd but < 75 gpd **AND** unstable, take data every 15 minutes.
- If leak ≥ 30 gpd but < 75 gpd **AND** stable for at least 1 hour (≤ 10% increase in 1 hour), take data every 2 hours.
- If leak < 30 gpd, take data once every 8 hours.

Time	*Date	R-15 (µCi/cc)	R-63 (µCi/cc)		Current Leakrate gpm (gpd)	**DELTA LEAKRATE gpm (gpd)/hr	Method Used To Determine Leakrate
			A	B			
1330	TODAY	2.6×10^{-6}	1.09×10^{-2}	1.9×10^{-2}			
1345	TODAY	6.4×10^{-6}	1.09×10^{-2}	1.9×10^{-2}			
1300	TODAY	7.9×10^{-6}	1.09×10^{-2}	1.9×10^{-2}			
1315	TODAY	8.57×10^{-6}	1.09×10^{-2}	1.9×10^{-2}			
1330	TODAY	8.5×10^{-6}	1.09×10^{-2}	1.9×10^{-2}			
1345	TODAY	8.5×10^{-6}	1.09×10^{-2}	1.9×10^{-2}			
1400	TODAY	8.5×10^{-6}	1.09×10^{-2}	1.9×10^{-2}			

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

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

File:
Task Number:

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Emergency Borate

JPM Number: S-1(a)

KA Number and Importance: 000024A120 RO – 3.2, SRO – 3.3

Suggested Environment: Simulator

Actual Testing Environment:

Alternate Path: YES

Time Critical: NO

Estimated Time: **Actual Time: _____**

References: ONOP-CVCS-3

INITIAL CONDITIONS:

1. The reactor has just tripped.

2. 31 BATP is aligned to the blender.

3. All actions in E-0, Steps 1-4 and ES-0.1, Steps 1 through 3 have been completed.

INITIATING CUES:

You are the ATC and the CRS has directed to emergency borate per ONOP-CVCS-3 up to and including the completion of Step 17.a due to multiple stuck rods.

TASK STANDARD:

The RCS has been Emergency Borated per ONOP-CVCS-3 up to and including the completion of step 17.a.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1	Obtain correct procedure	ONOP-CVCS-3	
2	Check Charging Pump running	Observe Charging Pump RUNNING	
3	Check MCC-36A and 36B available	Verify MCC-36A and 36B energized	
4	OPEN Emergency Boration Valve **CUE:** Inform operator that MOV-333 will **NOT** OPEN - borate from the RWST	Places CH-MOV-333 to OPEN Observes Valve does not Open	
●5	Place Boric Acid Transfer Pumps in Fast Speed	Rotates Switches to Fast position	
●6	Restart Boric Acid Transfer Pumps	Rotate Boric Acid Transfer Pump Switches to Start	
●7	Place FCV-110A, Boric Acid Flow Control Blender, controller in Manual	Raise "T" bar switch to Manual Position	
●8	Ensure FCV-1110A, , Boric Acid Flow Control Blender, controller is fully open	Move "T" bar to left Open	
●9	Place FCV-111A, Makeup H2O to Boric Acid Blender, controller in Manual	Raise "T" bar switch to Manual Position	
●10	Ensure FCV-111A, , Boric Acid Flow Control Blender, controller is closed	Move "T" bar to left Open	
●11	Place Makeup Mode Selector switch in Manual	Rotate Switch to Manual Position	
●12	Turn Makeup Control Switch to Start and Return to Normal	Rotate Switch to Start then back to Normal	
13	Check FI-110A flow Indicated	Observe Flow is indicated	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
14	Close Boric Acid Storage Tank Recirculation Valves	Rotate Controllers (Panel SFF) to 0%	
15	Transfer operating charging pump speed to manual and Increase speed to MAXIMUM	Place Auto/Manual switch to Manual and rotate small potentiometer to increase speed increase speed to Maximum	
16	Check Pressurizer pressure LESS THAN 2335 psig	Verify Pressurizer pressure < 2335 psig	
17	Check status of reactor	Verify reactor subcritical	
11	Check RCS temperature >500°F	Verify RCS >500°F	
12	Check RCS temperature >540°F	Observe RCS approximately 230°F	
13	If any rod is greater than or equal to 20 steps emergency borate per attachment 4	Observes 2 rod fully withdrawn	
●14.	Determine boration time NOTE: Minimum Boration Time 142 seconds Candidate may calculate up to 284 **CUE: (Time Compression) Inform candidate that the calculated time has passed.**	Determines minimum of 142 seconds	
13	Determine status of Control Rods	Determine 2 Rods > 20 Steps	
14	Determine amount of boron concentration increase required **NOTE:** 212 ppm for each additional rod greater than one	Calculate 212 ppm boron concentration increase required	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
15	Determine boration time required **NOTE:** 34 min for each additional rod greater than one If candidate stops and is waiting for time to elapse, **CUE: (Time Compression) Inform candidate that additional 34 minutes has passed**	Determine 34 minutes required	
16	Direct Watch Chemist to sample RCS boron concentration **CUE:** Acknowledge as Watch Chemist	Direct Watch Chemist to sample RCS for boron concentration	
17	Determine if boration completed **CUE: (Time Compression) Inform candidate that additional 34 minutes has passed**	Determine expected boration time completed OR required boron concentration achieved	
18	Place boric acid transfer pumps to SLOW	Rotate speed switch to slow position	
19	Turn Makeup Control Switch to Stop	Rotate Makeup Control Switch to Stop	
20	Open Boric Acid Storage Tank Recirculation Valves to approximately 25%	Rotate valve potentiometer to 25%	
	JPM Complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Simulator Setup

Reset to any 100% IC

Insert Malfunctions for Stuck Rods

MAL-CRF004AJ (CBB – Rod H12) – UNTRIPPABLE
MAL CRF004AZ (CBD – Rod K2) – UNTRIPPABLE

Manually trip the reactor.

Open Atmospheric Steam Dumps to cooldown to approximately 530°F

INITIAL CONDITIONS:

1. The reactor has just tripped.

2. 31 BATP is aligned to the blender.

3. All actions in E-0, Steps 1-4 and ES-0.1, Steps 1 through 3 have been completed.

INITIATING CUES:

You are the ATC and the CRS has directed to emergency borate per ONOP-CVCS-3 up to and including the completion of Step 17.a due to multiple stuck rods.

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

INITIAL CONDITIONS:

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

INITIATING CUES:

You are the ATC and the CRS has directed you to transfer to Cold Leg Recirculation per ES-1.3, steps 1 through 12.

TASK STANDARD:

Cold Leg Recirculation established prior to RWST level lowering below 1.5 feet with recirculation flow to the core approximately 360 gpm.

■ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1	Obtain correct procedure	ES-1.3, Step 1	
2	Review Caution and Note prior to Step 1	Caution and Note reviewed	
3	Determine if transfer to Cold Leg Recirc is required	Verify both RWST Low-Low Level alarms LIT and VC Sump trending up	
4	RESET SI	Verfy SI reset	
5	Check SI RESET	Verify SI Actuated light extinguished	
6	RESET Containment Spray	VC Spray reset per initiating cue	
■7	Align SI Recirc Switches #1 and #3	Place Recirc Sw #1 and #3 to ON	
8	Energize the following valves on MCC-36A and MCCC-36B: AC-MOV-743, 744 and SI-MOV-894A AC-MOV-1870, SI-MOV-882 and SI-MOV-894B, 894D **CUE:** Acknowledge as NPO **Booth Operator:** Energize valves	Dispatch NPO to energize valves on MCC 36A and 36B	
9	Establish communications with PAB 73 ft. and prepare for operation of SWN-35-1 and 35-2 **CUE:** Acknowledge as NPO	Dispatch NPO to PAB, 73 ft.	
10	Check status of Recirc Switch #1	Verify Recirc Switch #1 function complete light LIT	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
11	Check status of Recirc Switch #3	Verify Recirc Switch #3 function complete light LIT	
12	Check RCS pressure less than intact SG pressure	Verify RCS pressure less than intact SG pressure	
●13	Stop both Motor Driven Auxiliary Feed pumps	Place 31 / 33 ABFP in PULLOUT	
14	Initiate performance of Attachment 1 **CUE:** Additional Team operator will perform parallel actions of Attachment 1 **BOOTH OPERATOR:** Verify 459, 460, 200 A,B, C closed, stop running Charging pump(s), place all Pressurizer heaters in OFF. Notify operator that Attachment 1 complete	Direct performance of Attachment 1	
15	Check status of SWN-FCV-1111 and 1112 **CUE:** FCV-1111 and 1112 are CLOSED	Dispatch NPO to verify SWN-FCV-1111 and 1112 CLOSED	
●16	Align SI Recirc Switch #2	Place Recirc Sw #2 to ON	
17	Check status of Recirc Switch #2	Verify Recirc Switch #2 function complete light LIT	
18	Establish communications with PAB 73 ft. **CUE:** Acknowledge as NPO	Request NPO to standby CCW Hx's	
19	Check RHR Hx CCW Shutoff Valves OPEN. **CUE:** Acknowledge as NPO	Verify 822 A and 822B OPEN	
20	Manually START 32 Recirc pump	Observes 32 Recirc pump NOT running	
21	Manually START 31 Recirc pump	Observes 31 Recirc pump NOT running	
22	Check RHR Pumps any available	Determines RHR Pumps available	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
*23	Place Safety Injection Recirc Switch No. 3 to OFF	Rotate Switch to OFF	
*24	Open 744 RHR Loop Isolation	Rotate Switch to Open	
25	Check 882 Residual Heat Removal Suction Stop Valve Closed	Observes valve Closed	
*26	Open Containment Sump Valves to RHR Pumps Suction in the following order • 885B • 885A	Rotate switches to Open	
*27	Close SI HCV-638 or 640	Rotate switch to close until valve is closed	
*28	Start One RHR Pump	Rotate one RHR Pump switch to Start	
*29	Place Safety Injection Recirc Sw No. 4 to OFF	Rotate Switch to Off	
*30	Close Valves 1802A and 1802B	Rotate switches to close position	
31	Verify Recirculation Trains not affected by sump blockage - Low Head Injection Line Low Flow alarm - SI Pump Suction Low Pressure alarm - Indications of erratic / reduced flow - Abnormal sump level indication	Verify indications of sump blockage do NOT exist	
*32	Determine Minimum Core Recirculation Flowrate	Throttle to maintain 360 gpm on lowest available indicator	
	JPM Complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Simulator Setup

Initiate Simulator to any 100% power IC
Insert Malfunctions:

- MAL-RCS001A – 100%
- MAL-CNS003A – Trip – Recirculation Pump 31 Trip
- MAL-CNS003B – Trip – Recirculation Pump 32 Trip

Run Simulator
Perform all actions of E-0, RO-1, E-1
Wait until RWST Low Low level alarms annunciate.
Freeze the Simulator
Take a Snapshot if JPM is to be used more than once.

INITIAL CONDITIONS:

1. A Large Break LOCA occurred approximately 25 minutes ago.

2. The RWST LOW LOW Level alarm has just illuminated.

3. SI has been RESET per RO-1 and procedure E-1, Steps 1 through 19 actions have been completed with Containment Spray reset.

INITIATING CUES:

You are the ATC and the CRS has directed you to transfer to Cold Leg Recirculation per ES-1.3, steps 1 through 12.

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Respond to Pressurizer Controlling Pressure Channel Failure High

JPM Number: S-3(c)

KA Number and Importance: 010000A202 Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Spray valve failures
RO - 3.9 SRO - 3.9

Suggested Environment: Simulator

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:
3-AOP-INST-1 Instrument or Controller Failures

INITIAL CONDITIONS:

The plant is at 100% Power

INITIATING CUES:

You are the ATC.

TASK STANDARD:

■ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
	CUE: Evaluator, inform operator as the CRS to implement immediate actions of 3-AOP-INST-1, Instrument/Controller Failures		
1.	Commence evaluation		
■2.	Identify Failure/Stabilize Plant	1. Determine PRZR pressure not NORMAL 2. Place PRZR pressure control in MANUAL	
3.	Check All Control Systems • Rod Control – Not Affected • PRZR Level Control – Not Affected • MBFP Speed Control – Not Affected • SG Level Control – Not Affected • SG Pressure Control – Not Affected • PRZR Pressure Control – IS AFFECTED	Check indications for all control systems	
4.	Determine an Instrument Failure has occurred	Determines an instrument failure has occurred; redundant indications and controller response	
■5.	Transition to procedure section for PRZR Pressure Failure	Selects proper procedure step from table	
■6	Manually operate Heaters and Sprays as necessary to maintain desired pressure	Adjust Master Pressure controller to close spray valves and energize heaters	
7	Determine PI-457 has not failed	Observes Indication	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
8	Determine PI-474 has not failed	Observes Indication	
■9	Place Pressurizer Pressure Defeat Switch in DEFEAT 1 & 4 (Rack B-6) **CUE:** A spare operator will monitor the flight panel	Rotates Switch to DEFEAT 1 & 4 position	
■10	Place Delta T Defeat Switch T/411A in Defeat Loop 1 (Rack B-8)	Rotates Switch to Loop 1 position	
11	Place Pressurizer Pressure Recorder to channel 2 or 3	Rotates Switch to channel 2 or 3 position	
12	Return Heaters and Sprays to Auto	Place Master Pressure Controller to auto	
13	Refer to Technical Specifications. **CUE:** The CRS is reviewing Tech Specs		
14	Observes Note before step	Reviews Note	
15	Check Redundant Bistables for failed channel NOT tripped	Using Attachment 6 Table 1 Check Bistable Status lights extinguished (Panel SOF)	
16	Observe NOTE before step	Reviews Note	
■17	Place the bistables to trip for failed channel in Rack Red A-4 • Loop 1 Overtemp Trip • Loop 1 Hi Press Trip • Loop 1 Lo Press Trip • Loop 1 Unblock SI • Loop 1 SI	Places bistable trip switches in the UP position	
18	Check all bistable status lights for failed instrument listed in Attachment 6 Table 3 illuminated	Observes all status lights illuminated	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	JPM Complete		

Simulator Setup

Initialize Simulator to any 100% power IC

Insert Malfunction
MAL-PRS005A Final Value 2500 psig Ramp – 15 seconds

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

INITIAL CONDITIONS:

The plant is at 100% Power

INITIATING CUES:

You are the ATC.

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Respond to a Loss of Main Boiler Feed Pump Speed Control

JPM Number: S-4(j)

KA Number and Importance: 000054A205 Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): - Status of MFW pumps, regulating and stop valves
RO – 3.5 SRO – 3.7

Suggested Environment: Simulator

Actual Testing Environment:

Alternate Path: YES

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:
3-AOP-FW-1 Loss of Feedwater

INITIAL CONDITIONS:

The plant was operating at 100% power
31 Main Boiler Feed Pump Trouble Alarm Annunciated.
31 Main Boiler Feed Pump is in Track and Hold.
All actions up to step 4.22 of 3-AOP-FW-1, Loss of Feedwater have been completed.

INITIATING CUES:

You are the Spare RO on shift. The CRS has directed you to perform Attachment 3 of 3-AOP-FW-1 for 31 MBFP in Track & Hold.

TASK STANDARD:

Track and Hold is reset and 31 MBFP is being controlled using the Startup Signal.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Dispatch NPO to the Lovejoy Control Cabinet NOTE: The candidate will perform actions at the Lovejoy Control Cabinet. **CUE:** NPO Acknowledges	Contact NPO and dispatch to Lovejoy Control Cabinet	
3.	Is in service FEEDBACK D LED lit or flashing **CUE:** NPO Reports Feedpump D LED is not lit or flashing	Contacts NPO and asks question.	
4.	Is PI-404 Failed High	Observes Meter Not Failed	
5.	Is Track and Hold LED lit or % Track and Hold signal displayed	Observes both Track & Hold LED is lit and % Track and Hold signal is displayed	
6.	Is continued Operation of the affected Main Boiler Feedpump desired? **CUE**: The CRS has determined that continued operation is desired		
7.	Are Percent FW and Percent Hold within 4% of each other?	Observes % FW and % Hold signals are NOT within 4% of each other	
8.	Adjust Percent Feedwater Controller to attempt to reduce difference to within 4%	Attempts to adjust 31 Main Boiler Feed Pump controller. Observes no change in %FW signal	
●9.	Select desired rate	Selects either 2 or 3	
●10.	Lower Percent Startup Signal below Percent Hold Signal using raise/lower switch	Rotates switch to lower position	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
11.	When Startup In Service LED is illuminated Notify I&C to perform the following	Contact I&C	
● 12.	Adjust OVD POS knob until green LED is as bright as possible	Observes green LED is illuminated	
● 13.	Place OVD SYS Enable/Off switch to Enable	Move Toggle Switch to Enable	
● 14.	Adjust FW OVD POS knob until FEEDWATER is 95%	Rotate knob clockwise until %FW is 95%	
● 15.	Press Track & Hold Reset	Depresses button	
16.	Did Failure Hold light extinguish	Observes LED is extinguished	
17.	Direct NPO to press signal processor RESET pushbutton	Depresses correct pushbutton	
18.	Did signal processor alarms extinguish	Observes alarms clear	
19.	Is affected MBFP speed under control?	Determines MBFP is under control	
	JPM is complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Simulator Setup

Reset simulator to any 100% power IC

Insert malfunction:
MAL-ATS005A

Run the simulator.

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

INITIAL CONDITIONS:

The plant was operating at 100% power
31 Main Boiler Feed Pump Speed Control Trouble Alarm Annunciated.
31 Main Boiler Feed Pump is in Track and Hold.
All actions up to step 4.22 of 3-AOP-FW-1, Loss of Feedwater have been completed.

INITIATING CUES:

You are the Spare RO on shift. The CRS has directed you to perform Attachment 3 of 3-AOP-FW-1 for 31 MBFP in Track & Hold.

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Start a Hydrogen Recombiner

JPM Number: S-5(e)

KA Number and Importance: 028000A401 Ability to manually operate and/or monitor in the control room: - HRPS controls RO – 4.0 SRO – 4.0

Suggested Environment: Simulator

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:

3-SOP-CB-007 H2 Recombiner Operation

INITIAL CONDITIONS:

A Large Break LOCA occurred 2 days ago.
All actions of ES-1.4 Transfer to Hot Leg Recirculation have been complete.
The Operating Crew Transitioned back to ES-1.3, Transfer to Cold Leg Recirculation.
Containment Hydrogen has slowly risen to 1.5%

Current VC Pressure – 2 psig
Pre-LOCA VC Pressure – 0 psig
Pre-LOCA VC Temperature – 98°F

INITIATING CUES:

You are the BOP and the CRS has directed you to place the 31 Hydrogen Recombiner in service.

TASK STANDARD:

31 Hydrogen Recombiner is in service.

■ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Energize 31 H2 Recombiner by placing breaker in ON **CUE:** NPO reports breaker closed	Directs NPO to close the breaker for 31 H2 Recombiner on MCC-36C	
3.	Verify Control Power Available light is lit on Hydrogen Recombiner Panel **CUE:** Control Power White Light is Lit	Observes Control Power Light	
4.	Verify Manual Heater Power Adjust potentiometer is set to 000	Rotate potentiometer fully counterclockwise	
5.	Verify Heater Mode Selector Switch is in Manual	Observes Switch in Manual	
6.	Note the following • Current VC Pressure • Pre-LOCA VC Pressure • Pre-LOCA VC Temperature **CUE:** If Simulating this JPM • Current VC Pressure – 2 psig • Pre-LOCA VC Pressure – 0 psig • Pre-LOCA VC Temperature – 98°F	Record parameters	
■7.	Determine Pressure Correction Factor (Cp) using Attachment 2	Determine Cp 1.165 ± .005	
8.	Record Cp on Attachment 4	Enters 1.165 on Attachment 4	
■9.	Determine Required Heater Power on Attachment 4 (Cp X 42.3 KW)	Determine approximately 49.3 KW	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
10.	Place Recombiner Control Switch in Start and Release **CUE:** Green Light OFF Red Light ON	Rotate Switch to Start and spring return to neutral	
11.	Slowly Adjust Manual Heater Power until 5 KW is indicated on Heater Power Meter and Hold for 10 minutes **CUE:** Meter indicates 5 KW	Rotate potentiometer clockwise observe heater power meter	
12	Slowly Adjust Manual Heater Power until 10 KW is indicated on Heater Power Meter and Hold for 10 minutes **CUE:** Meter indicates 10 KW	Rotate potentiometer clockwise observe heater power meter	
13.	Slowly Adjust Manual Heater Power until 20 KW is indicated on Heater Power Meter and Hold for 5 0 minutes **CUE:** Meter indicates 20 KW	Rotate potentiometer clockwise observe heater power meter	
14	Adjust Manual Heater Power as required to maintain Required Heater Power per Attachment 4 **CUE:** Meter indicates 49.3 KW	Rotate potentiometer clockwise observe heater power meter	
	JPM Complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Reset the Simulator to any IC. It is not necessary to establish Post LOCA conditions.

INITIAL CONDITIONS:

A Large Break LOCA occurred 2 days ago.
All actions of ES-1.4 Transfer to Hot Leg Recirculation have been complete.
The Operating Crew Transitioned back to ES-1.3, Transfer to Cold Leg Recirculation.
Containment Hydrogen has slowly risen to 1.5%

Current VC Pressure – 2 psig
Pre-LOCA VC Pressure – 0 psig
Pre-LOCA VC Temperature – 98°F

INITIATING CUES:

You are the BOP and the CRS has directed you to place the 31 Hydrogen Recombiner in service.

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Remove a Power Range Nuclear Instrument From Service

JPM Number: S-6(f)

KA Number and Importance: 015000A201 Ability to (a) predict the impacts of the following malfunctions or operations on the NIS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Power supply loss or erratic operation.
RO- 3.5 SRO- 3.9

Suggested Environment: Simulator

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:

3-SOP-NI-001 Excore Nuclear Instrumentation System Operation

INITIAL CONDITIONS

The plant is operating at 100% power.
Power Range Channel N41 is operating erratically.
The Shift Manager has declared N41 inoperable.

INITIATING CUES:

You are the BOP and the CRS has directed you to remove channel N41 from sevice

TASK STANDARD:

Channel N41 removed from service

■ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Circle selected channel	Circles N41	
3.	If removing channel from service due to partial failure obtain guidance from I&C and Reactor Engineering. **CUE:** Channel is NOT being removed from service due to partial failure		
■4.	Place Dropped Rod Mode Selector Switch in BYPASS	Switch rotated to BYPASS	
5.	If Control Power is available check • Dropped Rod Bypass lamp illuminated • NIS Rod Dropp Bypass PR 41 lamp on Panel FBF is illuminated • NIS Trip Bypass alarm on Panel SBF-1 is annunciated	Checks lamps illuminated	
■6.	Place applicable Rod Stop Bypass switch in BYPASS PR N41	Rotate Switch to N41 Position	
7.	Place applicable Power Range Channel Percent Power Computer Input Out of Limit Check **CUE:** The STA will remove channel from limit check		
8.	Observe Warning Caution and Notes	Reviews Warning Caution and Notes	
■9.	Block the dropped rod protection bypass relays for the selected channel by placing the blocking strip across the back of the relay NOTE Blocking strips are installed	Screw bolt in to engage relay	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
●10.	Defeat selected channel ΔT signal by placing the delta T Defeat Switch in Defeat Channel 1 Rack B-8	Rotate Switch to Defeat Ch 1	
11.	Verify ΔT Recorder selected to unselected channel	Rotate recorder switch to channel 2, 3, or 4	
12.	Observe caution	Review Caution	
13.	Check the Overtemperature ΔT bistables for the unselected channels are extinguished on panel SOF	NA the Selected Channel and Checks the remaining channels extinguished	
14.	Observe Note	Reviews Note	
●15.	Place the Overtemperature ΔT bistable for Loop 1 Over Temp Trip in the tripped position Rack A-4	Places trip switch in the up position	
16.	Check Overtemperature ΔT bistable for Loop 1 Over Temp Trip is lit Panel SOF	Observes light illuminated	
17.	Check Overtemp ΔT Channel Trip or Rod Stop alarm lit on panel SAF	Observes annunciator lit	
18.	Verify Rod Control Mode Selector Switch is in Manual	Observes Switch is in Manual	
●19.	Place Power Mismatch Bypass Switch in PYBASS PR N41	Rotates Switch to N41 position	
20.	When a minimum of two minutes has elapsed, Return Rod Control to Automatiic	Rotates Rod Control Mode Selector Switch to Automatic	
●21.	Place Detector Current Comparator Upper Section Switch in PR N41	Rotates switch to PR N41 position	
●22.	Place Detector Current Comparator Lower Section Switch in PR N41	Rotates switch to PR N41 position	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
23.	Place Comparator Channel Defeat Switch to N41 position	Rotates switch to N41 position	
24.	Check Comparator Defeat light is lit	Observes light lit	
25.	Check no other overpower high range hi flux trip bistables are tripped on Bistable Status Panel Panel SOF	Observes no other light lit	
26.	Check if overpower low range high flux trips are NOT Blocked	Observes Overpower Low range high flux trip are blocked	
27.	Observe NOTES	Reviews Notes	
28.	Trip all NIS bistables associated with the selecte channel by removing both instrument and control power fuses	Removes fuses	
29.	Check alarms on Panel SBF-1 • NIS Power Range Loss of Detector Voltage • NIS Poser Range Single Channel High Range Trip	Observes alarms lit	
30.	Check Overpower High Range Hi Flux Trip bistable for N41 is lit Panel SOF	Observes light lit	
31.	Verify NR-45 Recorder selected to an unselected channel	Rotate switch to Channel 2, 3, or 4 if necessary	
	JPM Complete		

Reset Simulator to any 100% Power IC.

INITIAL CONDITIONS

The plant is operating at 100% power.
Power Range Channel N41 is operating erratically.
The Shift Manager has declared N41 inoperable.

INITIATING CUES:

You are the BOP and the CRS has directed you to remove channel N41 from sevice

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Reset R-18 Alarm Setpoint using the RM-23A Module

JPM Number: S-7(g)

KA Number and Importance: 073000A402 Ability to manually operate and/or monitor in the control room: - Radiation monitoring system control panel.
RO – 3.7 SRO – 3.7

Suggested Environment: Simulator

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:

3-SOP-RM-008 Radiation Monitor Control Cabinet (Bantam 11/RM-23A Cabinet

INITIAL CONDITIONS

Preparations are underway to release 31 Waste Holdup Tank
The current alarm setpoint for R-18 is 4.0 X 10^{-4} µCi/ml
The calculated alarm setpoint for the release is 1.25 X 10^{-3} µCi/ml
The Bantam 11 Control Cabinet is OOS for maintenance.

INITIATING CUES:

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

TASK STANDARD:

R-18 Alarm setpoint is reset using the RM-23A controller.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Determine NOT changing R-1 or R-33 Setpoint	Given in initial conditions	
●3.	Depress Channel	Depresses R18 LIQ button on RM-23A	
●4.	Insert key and turn Norm Supervisor switch to Supervisor	Insert Key and rotate switch to Supervisor	
5.	Verify SUPV Mode LED is ON	Observes SUPV Mode LED ON	
●6.	If changing High Alarm set point ENTER 009	Enter 0 0 9 using keypad	
7.	Determine NOT changing Alert set point at this time		
●8.	Depress ITEM and verify current setpoint is displays	Depresses ITEM button and observes digital display	
●9.	Enter new set point using the following format [1] [2] [5] [–] [0] [3]	Enters data in stated format	
●10.	Verify desired value is displayed then depress ENTER key	Observes digital display correct then presses ENTER key	
●11.	Turn Normal Supervisory Key Switch to NORMAL and remove key	Rotate key to NORM and remove	
12	Depress desired channel button to return display to normal	Depress R18 LIQ button	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
13	IF RM-23A alarm set point was changed Verify Supv Mode LED is OFF	Observes LED is OFF	
	JPM is Complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

This JPM can be run from any IC.

INITIAL CONDITIONS

INITIATING CUES:

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Transfer Buses 1 – 4 to the Station Aux Transformer

JPM Number: S-8(h)

KA Number and Importance: 062000A401 Ability to manually operate and/or monitor in the control room: - All breakers (including available switchyard)
RO – 3.3 SRO – 3.1

Suggested Environment: Simulator

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:
3-SOP-EL-005 Operation of On-Site Power Sources

INITIAL CONDITIONS:

A plant shutdown is in progress in accordance with 3-POP-3.1.
Generator Load is approximately 35 MWe

INITIATING CUES:

You are the BOP and the CRS has directed you to Transfer Buses 1 – 4 to the Station Aux Transformer in accordance with 3 SOP-EL-005 section 4.4.

TASK STANDARD:

Buses 1 – 4 are energized from the Station Aux Transformer and Unit Aux Transformer breakers are open.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Observe NOTES before step 4.4.1	Reviews Notes	
3.	Ensure less than 100 volts difference between Station and Unit Auxiliary Transformers	Observe Meters; Adjusts Unit Aux Transformer Tap Changer if necessary	
	If desired to transfer 6.9 KV Bus 1 to the Station Aux Transformer	Determine transfer is desired	
4.	Perform Voltage Check per step 4.4.1	Observe Station Aux and Unit Aux transformer voltage meters	
●5.	Place 6900 Bus 1 Synchroscope in Bus 1 Bus 5 position	Places handle in switch location and rotate switch to bus1 bus 5 position	
●6.	If Synchroscope is at 12 o'clock then Close the Bus No. 1-5 Tie Breaker	Rotate Switch to Close then release to auto	
●7.	Open 6900 Bus 2 Normal Feed Breaker	Rotate Switch to Open the release to auto	
8.	Place 6900 Bus No. 1 Synchroscope in Off	Rotate switch to Off	
9.	Ensure less than 2000 amps on 6900 KV bus 5	Observe meter determines < 2000 amps	
	If desired to transfer 6.9 KV Bus 2 to the Station Aux Transformer	Determine transfer is desired	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
10.	Ensure both 2A-3A Tie breaker is Open	Observes breaker Open	
11.	Perform Voltage Check per step 4.4.1	Observe Station Aux and Unit Aux transformer voltage meters	
●12.	Place 6900 Bus 2 Synchroscope in Bus 2 Bus 5 position	Places handle in switch location and rotate switch to bus1 bus 5 position	
●13.	If Synchroscope is at 12 o'clock then Close the Bus No. 2-5 Tie Breaker	Rotate Switch to Close then release to auto	
●14.	Open 6900 Bus 2 Normal Feed Breaker	Rotate Switch to Open the release to auto	
15.	Place 6900 Bus No. 2 Synchroscope in Off	Rotate switch to Off	
16.	Ensure less than 2000 amps on 6900 KV bus 5	Observe meter determines < 2000 amps	
	If desired to transfer 6.9 KV Bus 3 to the Station Aux Transformer	Determine transfer is desired	
17.	Ensure both 2A-3A Tie breaker is Open	Observes breaker Open	
18.	Perform Voltage Check per step 4.4.1	Observe Station Aux and Unit Aux transformer voltage meters	
●19.	Place 6900 Bus 3 Synchroscope in Bus 3 Bus 6 position	Places handle in switch location and rotate switch to bus1 bus 5 position	
●20.	If Synchroscope is at 12 o'clock then Close the Bus No. 3-6 Tie Breaker	Rotate Switch to Close then release to auto	
●21.	Open 6900 Bus 3 Normal Feed Breaker	Rotate Switch to Open the release to auto	

Transfer Buses 1 – 4 to the Station Aux Transformer

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
22.	Place 6900 Bus No. 3 Synchroscope in Off	Rotate switch to Off	
23.	Ensure less than 2000 amps on 6900 KV bus 6	Observe meter determines < 2000 amps	
	If desired to transfer 6.9 KV Bus 4 to the Station Aux Transformer	Determine transfer is desired	
24.	Perform Voltage Check per step 4.4.1	Observe Station Aux and Unit Aux transformer voltage meters	
25.	Place 6900 Bus 4 Synchroscope in Bus 4 Bus 6 position	Places handle in switch location and rotate switch to bus1 bus 5 position	
26.	If Synchroscope is at 12 o'clock then Close the Bus No. 4-6 Tie Breaker	Rotate Switch to Close then release to auto	
27.	Open 6900 Bus 4 Normal Feed Breaker	Rotate Switch to Open the release to auto	
28.	Place 6900 Bus No. 4 Synchroscope in Off	Rotate switch to Off	
29.	Ensure less than 2000 amps on 6900 KV bus 6	Observe meter determines < 2000 amps	
30.	When transfer complete, ensure Unit Aux and Station Aux Tap Changers are in automatic	Ensure both tap changer switches are pulled out	
	JPM is complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Simulator Setup

Reset Simulator to IC – 9
Reduce Load to < 40 MWe

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

INITIAL CONDITIONS:

A plant shutdown is in progress in accordance with 3-POP-3.1.
Generator Load is approximately 35 MWe

INITIATING CUES:

You are the BOP and the CRS has directed you to Transfer Buses 1 – 4 to the Station Aux Transformer in accordance with 3 SOP-EL-005 section 4.4.

File:
Task Number:

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Locally Start 32 Aux Boiler Feedpump

JPM Number: In Plant 1(j)

KA Number and Importance: 2.1.30 Ability to locate and operate components, including local controls.
RO 4.4 SRO 4.0

Suggested Environment: In Plant

Actual Testing Environment:

Alternate Path: YES

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:

3-SOP-ESP-001 Local Equipment Operation and Contingency Actions

INITIAL CONDITIONS:

1. The Control Room has been evacuated due to a fire.
2. No ABFPs started.
3. An NPO is available to control feedwater flow to the individual SGs.

INITIATING CUES:

You are the RO in the ABFP Building and the CRS has directed you to locally start 32 ABFP per 3-SOP-ESP-001, section 4.1.8 up to and including section 4.1.8.11 Inform the RO when 32 ABFP discharge pressure is 600 psig.

TASK STANDARD:

32 ABFP running with approximately 600 psig discharge pressure

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	NOTE: Remind operator to NOT change any switch or valve positions		
1	Obtain correct procedure	3-SOP-ESP-001, section 4.1.8	
2	Determine if MS-PCV-1310A, 32 ABFP Steam Supply Isolation valve, is OPEN **CUE:** Valve is OPEN	Observes valve stem limit switch position	
3	Determine if MS-PCV-1310B, 32 ABFP steam Supply Isolation valve, is OPEN **CUE:** Valve is OPEN	Observes valve stem limit switch position	
4.	If directed to use handwheels to control FCVs then rotate applicable FCV handwheels in the closed direction **CUE:** The NPO will control individual FCVs	Direct the NPO to perform steps 4.1.8.7 a through e	
●5	ADJUST HCV-1118 32 ABFP Turbine Speed Control manual handwheel for idle speed **CUE:** Handwheel in close position	CLOSE MS-HCV-1118 using manual handwheel	
●6	CLOSE IA-865 32 ABFP MS-HCV-1118 Instrument Air Isolation valve **CUE:** Valve closed	CLOSE IA-865	
●7	BLEED off air from 32 ABFP MS-HCV-1118 by removing cap and opening MS-456 **CUE:** Cap removed and valve open	Remove cap and OPEN MS-456	
●8	OPEN HCV-1118, 32 ABFP Turbine Speed Control valve approximately 1/8" **CUE:** Valve open 1/8"	Manual handwheel adjusted until valve stem ~1/8" OPEN	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
9	Start 32 ABFP **CUE:** Turbine heard increasing speed of pump	Place 32 ABFP Trip/Auto/On local control switch to ON	
10	Review notes prior to step 4.1.8.10	Notes reviewed	
11	Verify correct discharge pressure for 32 ABFP **CUE:** Discharge pressure indicated 250 psig	Observes 32 ABFP discharge pressure gauge NOT indicating 600 psig	
12	Adjust PCV-1139 A/M station manual loading pressure to match the instrument loading pressure (do not exceed 13 psig) **CUE:** Pressure indicates 12.5 psig	Rotate handle until pressure indicates approximately 12 – 12.5 psig	
13	Turn the Auto/Manual switch on the PCV-1139 A/M station to MANUAL	Switch rotated to Manual	
14	Slowly adjust PC-1139 AM Station Manual loading pressure to approximately 12 psig **CUE:** Indicator reads 12 psig	Rotate knob until indicator 12 psig	
15	Adjust PC-1139 A/M station Manual Loading pressure to maintain steam inlet pressure to 32 Aux Boiler Feed Pump turbine at approximately 600 psig	Observe inlet pressure approximately 600 psig	
16	Adjust turbine speed using HCV-1118 until discharge pressure is 600 psig **CUE:** Discharge pressure indicates 600 psig	Observes discharge pressure approximately 600	
	Inform CCR 32 ABFP discharge pressure is 600 psig **CUE:** CCR acknowledges	CCR Informed	

Any area of weakness observed? YES ☐ NO ☐

Examinee Signature

All areas of observed weakness discussed

Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIAL CONDITIONS:

1. The Control Room has been evacuated due to a fire.
2. No ABFPs started.
3. An NPO is available to control feedwater flow to the individual SGs.

INITIATING CUES:

You are the RO in the ABFP Building and the CRS has directed you to locally start 32 ABFP per 3-SOP-ESP-001, section 4.1.8 up to and including section 4.1.8.11 Inform the RO when 32 ABFP discharge pressure is 600 psig.

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Start 32 CCW Pump from MCC312A

JPM Number: In Plant -2(j)

KA Number and Importance: 2.1.30 Ability to locate and operate components, including local controls.
RO 4.4 SRO 4.0

Suggested Environment: In Plant

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:
3-AOP-SSD-1 Control Room Inaccessibility Safe Shutdown

INITIAL CONDITIONS:

The plant is in MODE 3

Control of 32 CCW pump from the Control Room is prevented due to Control Room evacuation due to a fire

Normal 480 volt power to the CCW pumps is not available

32 CCW pump will be the only load on MCC-312A

Power is available to MCCs-312 and 312A

The Nuclear NPO is standing by to assist you

INITIATING CUES:

You are the BOP and the Shift Manager has directed you to transfer the power supply for 32 CCW pump to MCC-312A and start the pump per SOP-EL-12, Section 4.2

TASK STANDARD:

32 CCW Pump running from its alternate feed (MCC-312A).

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Remove load from Bus 312 per Attachment 1 **CUE:** MCC-A, C or E-1 feeder breaker open	MCC-A feeder **OR** MCC-C feeder **OR** MCC-E-1 feeder open	
3	Visually verify 32 CCW pump is not running **CUE:** Nuclear NPO reports 32 CCW pump is not running	Direct Nuclear NPO to verify pump is not running	
4.	Verify 32 CCW Pumps transfer switch is de-energized **CUE:** Nuclear NPO reports all 8 lights are extinguished	Direct Nuclear NPO to verify all eight indicating lights are off	
5.	Review Caution and Note	Caution and Note reviewed	
●6	Unlock and place 32 CCW pump alternate feed transfer switch in Alternate feed position **CUE:** Nuclear NPO reports transfer switch rotated clockwise 360° to Alternate Feed position	Direct Nuclear NPO to rotate disconnect switch 360° to alternate feed position	
●7	Unlock and place disconnect switch on MCC-312A for 32 CCW pump to on **CUE:** Disconnect switch is on	Unlock and place disconnect switch to on	
●8	Start 32 CCW pump **CUE:** Key switch in start position	Push in and turn key switch to start position	
9	Verify 32 CCW pump is running **CUE:** Red running light is illuminated	Observe red running light illuminates	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	JPM Complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIAL CONDITIONS:

The plant is in MODE 3

Control of 32 CCW pump from the Control Room is prevented due to Control Room evacuation due to a fire

Normal 480 volt power to the CCW pumps is not available

32 CCW pump will be the only load on MCC-312A

Power is available to MCCs-312 and 312A

The Nuclear NPO is standing by to assist you

INITIATING CUES:

You are the BOP and the Shift Manager has directed you to transfer the power supply for 32 CCW pump to MCC-312A and start the pump per SOP-EL-12, Section 4.2

ENTERGY (IP3)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

JPM Title: Perform Local Containment Isolation Valve Lineup IVSW

JPM Number: In Plant – 3(j)

KA Number and Importance: 2.1.30 Ability to locate and operate components, including local controls.
RO 4.4 SRO 4.0

Suggested Environment: In Plant

Actual Testing Environment:

Alternate Path: NO

Time Critical: NO

Estimated Time: **Actual Time: _____**

References:
3-SOP-CB-11 Non-Automatic Containment Isolation

INITIAL CONDITIONS:

The plant experienced a Small Break LOCA.
The operating crew is in 3-ES-1.3, Transfer to Cold Leg Recirculation
Internal Recirculation is established.
All RCPs are stopped.

INITIATING CUES:

You are the Nuc Side NPO and the CRS has directed you to perform 3-SOP-CB-11 Attachment 1 steps 1-5.

TASK STANDARD:

3-SOP-CB-11 Attachment 1 Steps 1-5 complete.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Observe Note before Step 1	Observes Note	
●3.	Open IV-1492 Manual N2 IVSW Header Isolation	Locates and Opens Valve	
●4.	Open IV-1493 Manual Seal Water Header Isolation	Locates and Opens Valve	
●5.	Open IV-1443 ManualN2 Header IV-PCV-1090 Outlet Isolation	Locates and Opens Valve	
6.	Close SI-859A Accumulator Drain/Safety Injection Test Line Isolation	Verified Closed Using COL	
7.	Close SI-859C Accumulator Drain/Safety Injection Test Line Isolation	Verified Closed Using COL	
●8.	Close SA-24-1 Station Air to Containment Containment Isolation Valve	Locates and Closes Valve	
●9.	Close SA-24-2 Station Air to Containment Containment Isolation Valve	Locates and Closes Valve	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
10.	Ensure Breakers are Open MCC-36C • AC-MOV-743 RHR Miniflow Isolation • AC-MOV-744 RHR Pump Discharge Isolation • CH-MOV-441 31 RCP Seal Injection Isolation • CH-MOV-442 32 RCP Seal Injection Isolation • CH-MOV-443 33 RCP Seal Injection Isolation • CH-MOV-444 34 RCP Seal Injection Isolation • SI-MOV-885A Containment Sump RHR Suction	Locate and Observe Breakers Open If necessary Simulate Opening Breakers	
11.	Ensure Breakers are Open MCC-36C • AC-MOV-1870 RHR Miniflow Isolation • CH-MOV-250A 31 RCP Seal Injection Isolation • CH-MOV-250B 32 RCP Seal Injection Isolation • CH-MOV-250C 33 RCP Seal Injection Isolation • CH-MOV-250D 34 RCP Seal Injection Isolation • SI-MOV-885BA Containment Sump RHR Suction	Locate and Observe Breakers Open If necessary Simulate Opening Breakers	
	JPM Complete		

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIAL CONDITIONS:

The plant experienced a Small Break LOCA.
The operating crew is in 3-ES-1.2, Post LOCA Cooldown and Depressurization

INITIATING CUES:

You are the Nuc Side NPO and the CRS has directed you to perform 3-SOP-CB-11 Attachment 1 steps 1-5.

Facility: IPEC Unit 3 Scenario No.: 1 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions:
Plant is at 45%. 31 EDG is OOS for an oil system modification.

Turnover:
Return power to 100%. 31 EDG is OOS and not expected back on this shift.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R(ATC) N(BOP) N(CRS)	Perform power ascension.
2	MAL-PRS006B	I(ALL) TS(CRS)	Controlling PZR level instrument fails low causing letdown to isolate. Channel is defeated and letdown is restored.
3	MAL-CVC003	C(ALL) TS(CRS)	Letdown leak inside containment. Leak will be isolated.
4	MAL-EPS005D	C(ALL)	480V Bus 6A fault.
5	MAL-ATS004A/B PRS003D	M(ALL)	Sequential loss of Main Feedwater Pumps leading to plant trip. PORV fails open, cannot be isolated.
6	MAL-SIS004A/B	C(CRS)	31 and 32 Safety Injection Pumps will not auto-start. (Neither board operator credited since either one may start pump.)
7	MAL-EPS001	C(ALL)	Station Blackout when Containment Phase A is reset.

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

Session Outline:

The session begins with power at 45% and 31 EDG out of service for an oil system modification. The team has been instructed to return the plant to 100% at 10% an hour. They will begin raising power per POP-2.1, "Operation above 45% Power".

When sufficient load ascension has been observed, the controlling PZR Level channel will fail low causing Letdown to isolate. The team will respond and restore Letdown per AOP-INST-1, "Instrument or Controller Failures".

When Letdown has been restored, a leak will occur on the Letdown line inside containment. This can be isolated per AOP-LEAK-1, "Sudden Increase in Reactor Coolant System Leakage".

Following leak isolation, a fault of 480V Bus 6A will occur. The team will respond per AOP-480V-1, "Loss of Normal Power to any Safeguards 480V Bus".

When the team has had time to address Charging, Service Water and RCP seal cooling, the Main Boiler Feed Pumps will sequentially trip. In response, the Team will trip the reactor as per the guidance of AOP-FW-1, "Loss of Feedwater" (although formal entry into the AOP is not required).

On the trip, PORV PCV-456 will fail open. Since Bus 6A is faulted, the MOV Block valve for this PORV cannot be closed. 31 and 32 SI pumps will not auto-start, but can be started manually. RCPs will be tripped due to loss of subcooling. A LOOP will occur when Containment Isolation Phase A is reset. The team will have to respond per EOP LOOP-1, "Loss of Offsite Power after SI Reset". When the team announces transition to E-1, the scenario will be terminated.

Procedure flowpath: POP-2.1, AOP-INST-1, AOP-Leak-1, AOP-480V-1, E-0, LOOP-1, E-1

Critical Tasks:

CT 1: Start at least 1 High Head Safety Injection Pump.

CT 2: Trip RCPs when RCP trip criteria are met.

CT 3: Start Essential Service Water Pump to cool EDGs following LOOP.

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	Expected response/instructor cues
IC Reset		Reset Simulator to 65% power IC
SES Setup Batch File	Run setup schedule and verify malfunctions and over-rides have been entered.	Loads LT-460 fails low on trigger 2 Loads letdown leak inside VC on trigger 3 Loads 6A fault on trigger 4 Loads sequential MBFP trips on trigger 5 Loads stuck open PORV when reactor trips Loads station blackout on Phase A reset Loads 31 EDG OOS Loads auto-start failures on 31/32 SI pumps
Floor Setup	Perform setup checklist. Update the Protected Equipment PC. Risk is Yellow	HANG PROTECTED EQUIPMENT tags for: 32 and 33 EDG PTO 31 EDG
Event 1	Power Ascension	Make notifications as requested by team.
Event 2	Click the Trigger 2 button at lead evaluator direction.	LT-460 fails low w/o ramp or delay MAL-PRS006B
Role Play	If I&C requested to investigate:	Inform team that a troubleshooting package is being developed.
Event 3	Click the Trigger 3 button at lead evaluator direction.	Letdown leak in VC w/o ramp or delay MAL-CVC003
Role Play	When called to support Excess Letdown	Open/adjust 33 charging pump recirc valve
Event 4	Click the Trigger 4 button at lead evaluator direction	Fault on Bus 6A w/o ramp or delay MAL-EPS005D

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	Expected response/instructor cues
Role Play	If asked to investigate Bus 6A	Bus has smell of ozone and probably tripped on actual fault. More troubleshooting will be required.
Event 5	Click the Trigger 5 button at lead evaluator direction	MBFPs trip sequentially 31 trips on trigger MAL-ATS004A 32 trips with 60 second delay MAL-ATS004B
Role Play	If asked for field actions	Support team as requested.

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

Event Description: Power Ascension

Time	Position	Applicant's Actions or Behavior
		Note: ***Team will have been about power ascension in a briefing room prior to taking the watch. A reactivity plan will have been developed before the team comes to the simulator.***
	ATC	Energize all PZR backup heaters
	ATC	If dilution is performed per reactivity plan: • Set primary water integrator for desired total dilution. • Place Makeup Mode Control Selector Switch in Dilute • Place the Makeup Control Switch in Start and back to Auto • Monitor Dilution If rod withdrawal is performed: • Place Rod Control Mode Selector Switch in Manual • Withdraw Control Rods
	BOP	Peer check dilution or rod withdrawal
	BOP	Using the MTG Governor, raise load per load schedule
	CRS	Supervise reactivity addition and load increase
Lead Evaluator		When sufficient load ascension has been observed notify booth to insert Event 2.

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

Event Description: Controlling PZR Level instrument fails low.

Time	Position	Applicant's Actions or Behavior
	CREW	Diagnose level failure based on: • PZR Low Level Alarm • LCV-459 Indicates Closed
	ATC	Announce failure of PT-460 low Place charging pump controller in manual
	CRS	Instruct team to perform immediate operator actions of AOP-INST-1, Instrument or Controller Failures.
	ATC	Checks for indications of other instrument failure
	CRS	Enters AOP-INST-1 and re-checks instrument status with ATC Verifies charging pump in manual
	BOP	Verifies alarms for failure
	CRS	Goes to section of procedure for failed PZR level instrument
	BOP	In back panel B-6 defeat failed level channel by taking L/460A LEVEL DEFEAT in DFT CH2
	BOP	Close letdown orifice valve CH-AOV-200B
	BOP	Place PCV-135and TCV-130 in manual and 50%
	BOP	Open LCV-459
	BOP	Open 200B and adjust HCV-142 and PCV-135 and TCV-130
	ATC	Adjust charging pump speed to maintain seal injection
	ATC	Reset backup heaters by placing switches in off and back to on
	CRS	Refer to T.S. Most limiting AOT is hours to trip bistables

Note:

When T.S. has been referenced, the next event can be entered. The next step in the procedure is to trip bistables. If this is observed bistable Loop 2 High Level Trip in rack A-10 will be tripped.

Lead Evaluator	Instruct booth to enter Event 3

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

Event Description: Letdown leak inside containment.

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	Diagnose letdown leak by indications of no indicated letdown flow and VCT level decrease. May see increase in VC humidity and sumps levels.
	CRS	Enters AOP-LEAK-1 Sudden Increase in Reactor Coolant System Leakage
	CRS	Will check for leaks in PORVs, Safeties, SGs
	CRS	Go to section for letdown leak
	BOP	Close 200B, 459 and 460
	ATC	Reduce charging pump speed
	BOP	Close HCV-142
	CREW	Should determine that leak has been isolated
	CRS	Direct BOP to place Excess Letdown in Service
	BOP	Using 3-SOP-CVCS-002 Place Excess Letdown in service: • Open CCW Valves to/from Excess Letdown HX • Have 33 Charging Pump recirc valve opened • Open Excess Letdown isolation valves • Align Excess Letdown to RCDT for warmup • Align Excess Letdown to VCT
	ATC	Adjust charging pump speed to restore PZR level and maintain seal injection
	CRS	Should address T.S. for RCS leakage and possibly PZR high level. May have to ask CRS as follow up question.
Lead Evaluator		When Excess Letdown flow has been established have booth 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
	CREW	Diagnose Loss of Bus 6A
	ATC	Start a charging pump
	BOP	Should call Nuke NPO to open recirc valve for running charging pump
	BOP	Start SW Pumps after checking pressure
	CRS	Check T.S. in either 8 hour AOT for inoperable 480V bus or LCO 3.0.3. due to 2 inoperable offsite circuits to bus.
Note: ***Event may proceed, but there will be no resolution on returning power to the bus.***		
Lead Evaluator		When sufficient actions have been observed have booth insert Event 5

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

Event Description: Sequential loss of Main Feedwater Pumps leading to plant trip.

Time	Position	Applicant's Actions or Behavior
	BOP/ATC	Diagnose loss of first MBFP based on alarm and pump indication
	CRS	Direct team to perform immediate operator actions of AOP-FW-1, Loss of Feedwater
	BOP/ATC	Diagnose loss of second MBFP
	ATC	Trips the reactor
	CRS	Directs team to perform the immediate operator actions of E-0, Reactor Trip or Safety Injection
	ATC	Verifies reactor trip by checking: • Flux decreasing • Rod Bottom Lights lit • IRPIs < 20 steps • Reactor trip and bypass breakers open
	ATC	Verifies turbine trip based on stop valve indication
	BOP	Verifies Power to 480V busses: • 5A, 2A and 3A will be energized by offsite power
	ATC	Checks if SI is required: • A PORV has failed open and cannot be isolated due to 6A losing power • ATC should recognize need for SI and manually initiate SI
	CRS	Announce entry into E-0 and re-perform first 4 steps.
Note: ***Actions will be continued on Event 6 D-2***		

Op-Test No.: 1 Scenario No.: 1 Event No.: 6 Page 1 of 1

Event Description: 31 and 32 Safety Injection Pumps will not auto-start.

Time	Position	Applicant's Actions or Behavior
	CRS/ATC	May observe that are no running HHSI pumps and start 31 and 32 SI Pumps at this time.
	ATC	Place 32 AFW pump in service to 33 and 34 SGs since 33 AFW does not have power.
	BOP or ATC	Critical Task 1: Start 31 or 32 SI Pumps (both should be started)
	BOP	Initiate procedure RO-1, BOP Actions during EOPs: • Check SI equipment Status (may start SI pumps per this step) • Place switches for Fan Cooler Unit Dampers in SI position • Place SW Valves 1104/1105 in open • Place CCR AC switch in incident postion • Reset SI • Reset Phase A (will initiate event 7)
	CRS/ATC	Check: • MBFP • MFRVs • SG Blowdown Valves • SI Flow (will start SI pumps if not already done) • Containment Spray not required • RCP seal cooling • RCS Temperature
	ATC	Critical Task 2: Trips RCPs after verifying trip criteria met

Note:

At about this time, it is expected that the BOP will have reset Phase A valves and caused initiation of area wide blackout. This will lead to power only being available to Bus 5A from 33 EDG.

Continued actions will be on Event 7 D-2

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

Event Description: Station Blackout when Containment Phase A is reset

Time	Position	Applicant's Actions or Behavior
	CREW	Diagnose Loss of Offsite Power
	CRS	Enters LOOP-1 Loss of Offsite Power after SI Reset
	BOP	Critical Task 3: Starts 34 SWP
	BOP	Places all CCW Pumps in trip pullout
	ATC/BOP	Starts 31 SI Pump (failure to do this constitutes failure of Critical Task)
	ATC/BOP	Starts 31 and 33 Fan Cooler Units
	ATC/BOP	Establishes AFW flow to 31 and 32 SG from 32 AFW pump
	ATC	Start 31 Charging Pump
	CRS/ATC	Back in E-0 determine need to transition to E-1 for stuck open PORV
Lead Evaluator		Terminate scenario when transition to E-1 is announced

Emergency Classification

ALERT: Per EAL 3.1.2 Primary system leakage exceeding capacity (75 gpm) of a single charging pump.

Turnover Information

Date/Time:	Today/Now
Condition:	Power Ops
% Power:	45%
Xenon:	Equilibrium
RCS Boron:	1040 ppm
PZR Press Control:	Channel 1
PZR Level Control:	Channel 2
RCS Total Leakage:	0.1 gpm
RCS Unidentified Leakage:	0.01 gpm
Condenser Air leakage	6 SCFM
RCS Gas activity	1.78E-2 µCi/cc
Risk Assessment:	Yellow

Plant Equipment Status:

31 EDG is OOS for oil system modification.

Instructions:

Return unit to 100% at 10% per hour.

Facility: IPEC Unit 3 Scenario No.: 2 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions:
Plant is at 5%. 31 Charging Pump is OOS for maintenance.

Turnover:
Come up to 10% power, then warm up the MTG and place it in service. 31 Charging Pump is OOS and not expected back on this shift.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R(ATC) N(CRS) N(BOP)	Perform power ascension.
2	XMT-040A	I(ALL) TS(CRS)	32 SG Pressure Channel Failure causing ADV to open.
3	MAL-CCW001A/B	C(CRS) C(BOP) TS(CRS)	31 CCW Pump trips and 32 CCW fails to auto-start.
4	MAL-CCW005A	C(CRS) C(BOP) TS(CRS)	CCW leak at 31 CCW Pump. Can be isolated
5	MAL-MSS009A	C(CRS) C(ATC)	Main Steam header break with no MSIVs auto-closing and 1 MSIV failing open.
6	MAL-RPS002A/B	M(ALL)	Failure of the Reactor to trip both Auto and Manual. Team will emergency borate and manually insert control rods.
7	MAL-HVA001A1	C(BOP)	31 Fan Cooler Unit fails to auto-start.

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

Session Outline:

The evaluation begins with the plant at 5% power ready to raise power and place the MTG in service. The following equipment is out of service:

- 31 Charging pump for PM.

The team has been instructed to raise power to 10% and begin warming up the MTG to bring the unit on line.

When sufficient power ascension has occurred, a failure of the 32 SG Pressure C channel (PT-429C) will occur. This will cause the Atmospheric Dump Valve for that SG to go full open. The ATC will place the valve in manual and closed. The team will enter AOP-INST-1 and trip bistables to satisfy Tech Specs.

When PT-429C bistables are tripped, 31 CCW pump will trip and 32 will fail to auto-start. Manual start of 32 CCW pump will work. After flow has been re-established a leak in CCW will occur at 31 CCW Pump. The team will take actions in accordance with AOP-CCW-1, Loss of Component Cooling.

Prior to completion of the Subsequent Actions of AOP-CCW-1, a steam break will occur in the Turbine Building. The team will attempt to manually trip the plant, close MSIVs, and perform actions of E-0, Reactor Trip or Safety Injection.

The reactor will not trip from the Control Room and the team will respond per FR-S.1, Response to Nuclear Power Generation / ATWS and will S/D the reactor by manually inserting control rods and initiating emergency boration. The reactor trip breakers will be locally opened when emergency boration is intitiated. The team will complete FR-S.1and transition to E-0, Reactor Trip or Safety Injection. Following SI actuation, 31 FCU does not auto-start.

The MSIVs will fail to auto close. All but 34 MSIV will be able to be closed in manual from the control room. The team will respond to the faulted SG per E-2, Faulted Steam Generator Isolation. If 34 SG is isolated in E-0, the scenario may be terminated when the transition to E-2 is announced. Otherwise terminate the scenario when E-2 is completed.

Procedure flow path: POP-1.3, AOP-INST-1, AOP-CCW-1, AOP-UC-1, E-0, FR-S.1, E-0, E-2

Critical Task:

CT 1: Insert negative reactivity when reactor fails to trip.

CT 2: Isolated faulted SG.

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset		Reset Simulator to 5% power IC
SES Setup Schedule File	**Load setup Schedule file** Transfer Actions to the Director Verify malfunctions / overrides entered	Holds off 31 Charging pump Inserts 31 FCU failure to auto-start Loads Rx trip breakers failure to auto-open Loads Rx trip breakers failure to manually open (from CCR) Loads 32 SG Press Channel C Failure on Event 1 Loads CCW pump failure on Event 2 Loads CCW leak on Event 3 Loads Main Steam header break on Event 4 Loads failure of all MSIVs to auto close Loads failure of 34 MSIV to close in auto or manual Loads autostart failure of 32 CCW Pump
Floor Setup	Perform setup checklist Distribute turnover sheets	Place c/s in TPO and hang Danger tag for: 31 Charging pump Place Protected Equipment tags for: 32 & 33 Charging pumps Update the protected equipment PC display
Event 1	Power Ascension	
Event 2	Actuate Event 2 **At lead evaluator direction**	32 SG Pressure Channel C will fail high w/o ramp or delay MAL SGN002F to 1400
Role Play	If NPO sent to investigate	Nothing unusual at transmitter.
Role Play	If I&C ask to investigate.	A troubleshooting package is being developed.
Event 3	Actuate Event 3 **At lead evaluator direction**	31 CCW Pump trips and 32 fails to autostart. MAL-CCW001B to failure to autostart at setup MAL-CCW001A to trip
Role Play	If NPO sent to investigate	Indications are that 31 CCW Pump breaker tripped on overcurrent. Motor is hot and smells like winding damage may have occurred.

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
Event 4	Actuate Event 4 **At lead evaluator direction**	CCW Leak at 31 HX (will be reported as from 31 CCW seal) MAL-CCW005A to 500 with 120s ramp
Role Play	If NPO sent to investigate	After NPO dispatched to locate leak, wait 2 minutes then report a lot of water is flowing out of 31 CCW pump seals. If the team directs the NPO to isolate the leak then, isolate by deleting *MAL-CCW005A*. Note: The CCW Surge tanks may empty if the leak is not isolated. The team will then trip the operating CCW pumps and attempt to trip the reactor. Event 2 (steam line break) should be activated prior to the reactor trip.
Role Play	If NPO dispatched to makeup to CCW: **LOA RMW012, 1** **LOA RMW013, 1**	OPEN CCW makeup valves: PW-831A PW-831B
Role Play	If NPO dispatched to split headers: **LOA CCW007** **LOA CCW008** **LOA CCW035** **LOA CCW036** **LOA CCW015** **LOA CCW016**	Operate valves as requested: NOTE: 832A / 764A not modeled 766A 766B 766C 766D 759C 759D
Event 5	Activate Event 5 **At lead evaluator direction**	Inserts Steam Break in Turbine Building on East Header at 100,000 lb/hr ramped over 300 seconds. MAL-MSS009A to 100000 with 300s ramp

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
NOTE:	**MAL MSS009A** As directed by lead evaluator	If the Team delays, increase the size of the steam break until the Team Trips the Rx.
Role Play	After the Team diagnoses the steam break	Call as the NPO to the CCR and report there is a lot of steam in the Turbine Building and appears to be from the 33' elevation.
Role Play	If asked to locally close 34 MSIVs in the ABFP building	NPO is unable to close 34 MSIVs. It appears to stuck open.
Event 6	**ATWS** Entered in Setup	Rx trip breakers fail to open from the CCR. They will open when tripped open locally by the NPO
Role Play	**When NPO sent to locally open Rx Trip Breakers** Delete reactor trip breaker malfunctions	Wait until Emergency Boration is commenced before locally opening reactor trip breakers MAL-RPS002A RTBs fail to open (auto) MAL-RPS002B RTBs fail to open (manual)
Role Play	When NPO dispatched to isolate seal injection	241A LOA-CVC007 241B LOA-CVC008 241C LOA-CVC009 241D LOA-CVC010
Event 7	Entered in Setup	Failure of 31 FCU to autostart.

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

Event Description: Perform power ascension.

Time	Position	Applicant's Actions or Behavior
		Note: ***Team will have been about power ascension in a briefing room prior to taking the watch. A reactivity plan will have been developed before the team comes to the simulator.***
	BOP	Controls SG level in manual using Low Flow Bypass Valves
	ATC	Energize all PZR backup heaters
	ATC	If dilution is performed per reactivity plan: • Set primary water integrator for desired total dilution. • Place Makeup Mode Control Selector Switch in Dilute • Place the Makeup Control Switch in Start and back to Auto • Monitor Dilution If rod withdrawal is performed: • Place Rod Control Mode Selector Switch in Manual • Withdraw Control Rods
	BOP	Peer check dilution or rod withdrawal
	CRS	Supervise reactivity additions
Lead Evaluator		When sufficient load ascension has been observed notify booth to insert Event 2.

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

Event Description: 32 SG Pressure Channel Failure causing ADV to open.

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	Diagnose PT-429C failure: • 32 ADV Open • 32 SG Press C Channel Meter high
	ATC	Places 32 ADV controller in manual and closes valve
	CRS	Directs team to perform immediate operator actions of AOP-INST-1, Instrument or Controller Failure
	ATC	Checks for instrument failures on flight panel instruments, determines only PT-429C has failed.
	CRS	Enters AOP-INST-1 and re-checks for failed instruments. Verifies that 32 ADV is closed in manual.
	CRS	Goes to AOP section for SG Press failure
	CRS	Refers to T.S. 6 hour AOT to trip bistables.
	BOP	Trips the following bistables in rack B-2: Loop 2C, Low Press Loop 2C, P2 < P3 – A Loop 3C, P3 < P2 - A
Lead Evaluator		When bistables are tripped instruct booth to insert Event 3.

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

Event Description: 31 CCW Pump trips and 32 CCW fails to auto-start.

Time	Position	Applicant's Actions or Behavior
	BOP	Diagnoses 31 CCW Pump Trip
	BOP	Starts 32 CCW Pump (may be directed by CRS)
	CRS	May enter AOP-CCW-1 for loss of CCW, but this is not necessary
	CRS	Evaluates T.S. for failed CCW Pump 30 day AOT
Lead Evaluator		When Pump has been started and CRS evaluates T.S. instruct booth to insert Event 4.

Op-Test No.: 1 Scenario No.: 2 Event No.: 4 Page 1 of 5

Event Description: Leak at 31 CCW Pump

Time	Position	Applicant's Actions or Behavior
	BOP	Diagnoses a loss of CCW surge tank level (this will be masked by swapping pumps for previous event)
	CRS	Enters AOP-CCW-1, Loss of CCW
	BOP	Calls NPO to makeup to surge tanks and investigate loss of CCW
	CRS	May initiate splitting of CCW headers
	CRS	Will direct isolation of leak when report of location is received
	BOP	Should place 31 CCW Pump in trip pull out and will have leak isolated
	CRS	Assess that leak has been isolated and review T.S. 72 hour AOT due to loop inoperability
Lead Evaluator		When leak has been isolated and CRS has had time to assess situation, instruct booth to insert Event 5

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

Event Description: Main Steam header break with no MSIVs auto-closing and 1 MSIV failing open.

Time	Position	Applicant's Actions or Behavior
	CREW	Diagnose steam break downstream of MSIVs: • Noise • Steam flow increase all channels • Tavg lowering • Turbine power lowering • Reactor power increasing
	CRS	May enter AOP-UC-1 or may just give order to: • Trip the reactor • Then close MSIVs
	ATC	Will attempt to trip reactor
Note: ***At this point actions will be tracked on D-2 for Events 6 and 7***		

Op-Test No.: 1 Scenario No.: 2 Event No.: 6 Page 1 of #

Event Description: Failure of the Reactor to trip both Auto and Manual.

Time	Position	Applicant's Actions or Behavior
	CRS	Instruct team to perform immediate operator actions of FR-S1
	ATC	Will insert control rods
	BOP	Will trip the turbine
	BOP	Direct NPO to locally trip the reactor
	BOP	Will establish greater than 686 gpm AFW flow
	BOP/ATC	Critical Task 1: Establish Emergency Boration as follows: • Check charging pump running • Open MOV-333 • Close HCV-104 and 105 • Start both BATPs in fast speed • Increase charging pumps speed to maximum
		Note: ***When emergency boration has been initiated, the NPO will trip the reactor locally. It will be acceptable (and preferred) at any point to close the MSIVs, but this action may not be done until FR-S1 is exited. Also, AFW flow may be reduced at this point.***
	ATC/BOP	Verify VC ventilation isolation
	CRS	Check SI status. SI will have actuated due to steam leak.
	BOP	Performs steps 35 – 42 of E-0 (SI verification)
	ATC	Checks reactor is subcritical
	ATC	Secures Emergency Boration (charging pump may be secured due to SI) Closes MOV-333 Place BATPs in slow speed Place HCV-104/105 to 25%
	ATC	Checks RCP seal cooling. CCW will be available for seal cooling.

	ATC	Aligns charging pump suction to RWST and starts a charging pump
	CRS	Exits FR-S1
Note: ***Actions will be continued on Event 7 D-2.***		

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

Event Description: 31 Fan Cooler Unit fails to auto-start.

Time	Position	Applicant's Actions or Behavior
	BOP	While performing SI verification steps will note that 31 FCU did not auto-start and will start it.
	CRS/ATC	Return to E-0
	ATC	If not already done, close MSIVs – 34 will not close
	CRS/ATC	Perform E-0 actions: • Verify reactor trip • Verify turbine trip • Verify power to 480V busses • Verify SI actuated
	CRS/ATC	Verify AFW Flow: • At this point, AFW flow will be reduced if not already done • This also may be where team addresses faulted SG
Note: ***It is critical that the following task be performed prior to exiting E-2, however it is acceptable and preferred that this action be performed sooner.***		
	BOP/ATC	Critical Task 2: Isolate faulted SG 34 as follows: • Close other three MSIVs • Secure AFW flow to 34 SG • Isolate the upstream traps for 34 SG
	BOP	Performs RO-1 procedure for SI verification and reset: • Verifies SI equipment (may start 31 FCU if not already done) • Resets SI • Resets Phase A

	CRS/ATC	Continue with E-0: • Verifies feedwater isolation • Verifies blowdown isolation • Verifies SI flow • Verifies Containment Spray not required • Verifies RCP seal cooling • Checks RCS Temperature • Checks for RCP trip criteria • Checks PORVs and Safeties • Checks if SGs are faulted
	CRS	Announces transition to E-2, Faulted SG Isolation
Lead Evaluator		If 34 SG has been isolated, terminate scenario. If isolation has not yet been accomplished, allow isolation in E-2 (the only action) and terminate when transition to E-1 is announced.

Emergency Classification

SAE: Per EAL 1.1.2 Red Path in F-0.1 Subcriticality and all manual attempts at tripping the reactor from the Control Room have failed to reduce power range to <5%.

Turnover Information

Date/Time:	Today/Now
Condition:	Power Ops
% Power:	5%
Xenon:	Equilibrium
RCS Boron:	1040 ppm
PZR Press Control:	Channel 1
PZR Level Control:	Channel 2
RCS Total Leakage:	0.1 gpm
RCS Unidentified Leakage:	0.01 gpm
Condenser Air leakage	6 SCFM
RCS Gas activity	1.78E-2 µCi/cc
Risk Assessment:	Green

Plant Equipment Status:

31 Charging Pump is out of service for a major PM.

Instructions:

Raise power to 10% in preparation for starting up MTG and bringing the unit online.

Facility: IPEC Unit 3 Scenario No.: 3 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions:
Plant is at 100%. 31 AFW Pump is OOS due to high vibrations. PORV 455C is inoperable due to blowing fuses.

Turnover:
Maintain 100% power conditions. 31 AFW Pump is OOS due to high vibrations. PORV 455C is inoperable due to blowing fuses.

Event No.	Malf. No.	Event Type*	Event Description
1	XMT-CVC049	I(ALL)	VCT level instrument fails low.
2	MAL-CVC005C	C(ALL) TS(CRS)	33 Charging Pump Trip.
3	MAL-SGN005C	C(ALL) TS(CRS)	900 gpd SGTL on 33 SG.
4		R(ATC) N(CRS) N(BOP)	Tech Spec required shutdown.
5	MAL-SGN005C MAL-PRS003D SWI-AIR002C	M(ALL)	SGTL becomes SGTR. PORV and Instrument Air to VC Valve failures will lead to loss of pressure control.
6	MAL-CFW001C	C(CRS) C(ATC)	33 AFW Pump fails to auto-start.
7	MAL-SIS004A	C(BOP)	31 Safety Injection Pump fails to auto-start.

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

SESSION OUTLINE:

The evaluation begins with the plant at 100% power steady state operation. The following equipment is out of service:

- # 31 ABFP was declared inoperable 3 hours ago due to high vibrations during its PT (TS 3.7.5 – 72 hr AOT)

- PORV 455C was declared inoperable 1 hour ago due to blowing its control power fuses. T/S is in progress. Per TS 3.4.11, the block valve has been closed with power removed and a 7 day AOT entered.

After taking the watch, the VCT Level instrument fails low. The team will respond per AOP-CVCS-1, "Chemical and Volume Control Malfunction".

When the VCT level failure has been addressed, the running Charging Pump will trip. The team will re-enter and take actions per AOP-CVCS-1, "Chemical and Volume Control Malfunction".

After performing actions for the Charging pump trip, a 900 gpd SG tube leak on 33 SG will occur. The team should take actions per AOP-SG-1, "Steam Generator Tube Leak". This will include begin a plant shutdown.

When the team has sufficiently progressed through the shutdown, the SGTL will become a SGTR. The team will trip the Reactor and initiate SI. 33 AFW pump will fail to auto-start requiring manual action to be taken in E-0. 31 SI pump will have to be manually started.

The team will transition to and take actions per E-3, "Steam Generator Tube Rupture". Normal and auxiliary spray will not be available due to a failure of PCV-1228, IA to VC to open. This, along with the PORV failure to open, will require the team to transition to ECA-3.3, 'SGTR Response without Pressurizer Pressure Control" until SI pumps are secured.

Procedure flow path: AOP-CVCS-1, AOP-SG-1, E-0, E-3, ECA-3.3

Critical Tasks:

CT 1: Establish 365 gpm AFW flow.

CT 2: Isolate 33 SG (ruptured SG).

CT 3: Establish and maintain cooldown in E-3.

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset	**IC 11**	Reset Simulator for proper IC
SES Setup Schedule File	Verify malfunctions / overrides entered	Deenergizes 31 ABFP Deenergize PCV-455C & Block Valve 535 Loads 33 ABFP trip malfunction Loads 33 Charging pump trip Loads SGTL 900 gpd Loads SGTR 400gpm Loads PCV-456 failure Loads auto-start failure of 31 SI pump Loads failure of PCV-1228
Floor Setup	Perform setup checklist Distribute turnover sheets Ensure Rx Vessel Head Vent valve fuses are available in ATC drawer	Ensure 33 Charging pump is in service Place c/s in TPO and hang Danger tag for: 31 ABFP Place PORV 455C in Closed Place block valve 535 to TPO Remove PCV-455C fuses in rear of Flight Panel Place Protected Equipment tags for: 32 & 33 ABFPs Update the protected equipment PC display
Event #1	Click the Event 1 button **At lead evaluator direction**	VCT Level Instrument Fails Low *Insert malfunction XMT-CVC049* | *LT-112 fails low*
Role Play	If I&C or NPO called to investigate	I&C will inform team that a troubleshooting package will be developed NPO will find no issues with the running charging pump
Event #2	Click the Event 2 button **At lead evaluator direction**	33 Charging pump trip *Insert malfunction MAL-CVC005C on event 1* | *CHARGING PUMP 33 TRIP*
Role Play	If NPO sent to investigate	NPO reports no obvious problems

Event #3	Click the Event 3 button **At lead evaluator direction**	SGTL on 33 S/G 900 gpd no ramp *Insert malfunction MAL-SGN005C to 0.1 on event 3* | *STEAM GENERATOR 33 TUBE LEAK*
Event #5	Click the Event 5 button **At lead evaluator direction**	SGTR on 33 S/G 400 gpm no ramp *Insert malfunction MAL-SGN005C to 201 on event 5* | *STEAM GENERATOR 33 TUBE LEAK*
Role Play	At CCR request	Perform various LOA's per NPO local task list
Role Play	If asked to investigate 33 ABFP trip	No obvious signs of pump problem but breaker shows over current trip

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

Event Description: VCT level instrument fails low.

Time	Position	Applicant's Actions or Behavior
	CREW	Diagnoses failure of VCT Level instrument: • Auto-makeup • VCT Low Level Alarm • Charging Pump Suction re-aligns to RWST (LCV-112B opens and LCV-112C closes)
	CRS	Enters AOP-CVCS-1, CVCS Malfunction
	BOP	Opens LCV-112C
	BOP	When LCV-112C indicates open, closes LCV-112B these actions re-align charging pump suction back to VCT
	ATC	Places Makeup Control Switch to Stop
	ATC	Place Makeup Mode Selector Switch to Manual
	CRS	Has procedure step to reduce load as necessary in case temperature changed due to makeup. This should not be necessary.
	CREW	Ensure VCT Pressure is 2-10 psig above pre-event value and have NPO monitor running charging pump.
Lead Evaluator		At this point there are no more actions until the instrument is repaired. Instruct booth to insert Event 2.

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

Event Description: 33 Charging Pump Trip.

Time	Position	Applicant's Actions or Behavior
	CREW	Diagnose 33 Charging Pump Trip: • RCP Thermal Barrier Low DP Alarm • 480V Motor Trip Alarm • Amber light on 33 Charging Pump Switch
	CRS	Enters AOP-CVCS-1
	BOP	Closed LCV-459 and 460
	ATC	Starts 31 or 32 Charging Pump
	ATC	Adjusts charging pump speed in manual to maintain 6-12 gpm seal injection flow
	BOP	Closes AOV-200B
	BOP	Place PCV-135 in manual and 50%
	BOP	Place TCV-130 in manual and 50%
	BOP	Opens LCV-459 and 460
	BOP	Opens AOV-200B
	ATC	Increases charging pump speed
	BOP	Adjusts PCV-135 and TCV-130 as necessary and may return valves to auto at this time.
Lead Evaluator		The charging pump will probably not be returned to auto at this time, so there are no more actions. The CRS should evaluate the TRM for the failed charging pump, but this may have to be a followup question. Instruct the booth to insert Event 3.

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

Event Description: 900 gpd SGTL on 33 SG.

Time	Position	Applicant's Actions or Behavior
	CREW	Diagnoses SGTL: • Increased trend on R-15 Steam Jet Air Ejector • Eventual Alert on R-15 • Slight increase in 33 SG steam line monitor
	CRS	Enters AOP-SG-1, Steam Generator Tube Leak
	ATC	Verifies that PZR Level is not affected by leakage
	CREW	Requests SG samples and field surveys to quantify leakage and identify leaking SG.
		Note: ***Time compression will be used for chemistry samples.***
	BOP	May perform Secondary Plant Isolation in parallel with S/D: • Bypass and Isolate Condensate Polisher • Adjust 33 SG ADV setting to 74% 1040psig • Close 33 SG Blowdown Isolation Valves • Close MS-42 Steam supply to 32 AFW Pump from 33 SG • Close LCV-1129
	CRS	Will determine that S/D is required to be: • < 50% in 1 hour • Mode 3 within and additional 2 hours ***Note:*** ***The plant is in a T.S. required shutdown, but this may have to discussed as a followup with CRS.***
		Note: ***Actions will continue on Event 4 D-2***

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

Event Description: Tech Spec Shutdown

Time	Position	Applicant's Actions or Behavior
	ATC	Develops reactivity plan using reactivity summary sheet
	CRS	Uses POP-2.1 attachment for load reduction Note: If requested, notifications will be made for CRS by personnel outside the control room.
	CREW	Hold reactivity briefing.
	ATC	Performs Boration for load reduction: • Sets boric acid integrator for required volume • Energizes all PZR backup heaters • Takes Makeup Mode Selector to BORATE • Starts boration by taking Makeup Control Switch to START and back to NORM • Borates 20 gallons at 10 gpm and then adjusts to flowrate determined in shutdown reactivity plan.
	BOP	Peer checks boration
	BOP	Begins load reduction using the MTG Governor
	ATC	Peer Checks MTG Governor manipulations
Lead Evaluator		When sufficient actions for shutdown are observed instruct booth to insert Event 5

Op-Test No.: 1 Scenario No.: 3 Event No.: 5 Page 1 of 2

Event Description: SGTL becomes SGTR. PORV and Instrument Air to VC Valve failures will lead to loss of pressure control.

Time	Position	Applicant's Actions or Behavior
	CREW	Diagnoses that SGTL has become SGTR: • Lowering PZR Level • Lowering PZR Pressure and possible Low Pressure Alarm • R-15 in Alarm
	ATC	May start a second charging pump
	BOP	May reduce letdown to 45 gpm
	CRS	Instruct Crew to: • Trip Reactor • Initiate SI
	ATC	Trips reactor, announces reactor tripped
	BOP	Manually actuates SI
	CRS	Instructs team to perform immediate operator actions of E-0
	ATC	Verifies reactor trip: • Trip/bypass breakers open • Flux decreasing • Rod bottom lights lit • IRPIs < 20 steps
	ATC	Verifies turbine trip: • May note that stop valves were previously closed • May use first stage pressure to confirm turbine trip
	BOP	Verifies power to 480V busses: • All powered from offsite power

	ATC	Verify SI: • SI will be actuated • SI buttons will be pressed again
	CRS	Enters E-0 and re-performs first four steps
Note: ***Actions will be continued on Event 6/7 D-2***		

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

Event Description: 33 AFW Pump and 31 SI Pump fail to auto-start

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	Critical Task 1: Establish at least 365 gpm AFW flow (approximately 800 gpm will be established): • Start 33 AFW Pump which will feed 33 and 34 SGs • Increase speed on 32 AFW Pump • Initiate feed to 31 and 32 SGs from 32 AFW Pump
	BOP	Will perform RO-1, BOP Operator Actions during EOPs: • Verify SI Pumps Running • 31 SI Pump will be manually started. • Verify other SI equipment • Align FCU damper switches to SI position • Align VC SW Valve (1104/1105) switches to on • Place CCR HVAC switch to SI position • Reset SI • Rest Phase A • Attempt to open PCV-1228 to establish instrument air to the VC, but valve will not open. • Resets MCCs • Initiates local action to align SW
	CRS/ATC	Performs E-0 actions: • Verifies FW isolation • Verifies SI flow • Verifies Containment Spray not required • Verifies RCP seal cooling • Verifies RCS Temperature • Checks if RCP trip criteria are met.

	CRS/ATC	Perform E-0 diagnostic steps and determine that transition to E-3, Steam Generator Tube Rupture is required.
	CRS/ATC	Check if RCP trip criteria are met
	CRS/ATC	Identify 33 SG as ruptured SG
	CRS/ATC	Critical Task 2: Isolate 33 SG – note these actions may not all be performed at the same time. • When 33 SG level reaches 9%: o Secure feeding 33 SG by closing AFW FRV for 33 SG • Set 33 SG ADV to 74% • Isolate steam traps upstream of 33 MSIV • Close 33 MSIV • Close MS-42 • Verify Blowdown Valves are closed for 33 SG
	CRS/ATC	Critical Task 3: Initiate cooldown of RCS to facilitate stopping RCS leakage without excessively cooling down RCS. Excessive cooldown will be indicated by causing an ORANGE or RED condition in RCS Integrity. • Determine cooldown target temperature based on 33 SG pressure (493F if pressure is 1000-1050 psig) • Use condenser steam dumps to initiate cooldown (max 0.4 E6 lbm/hr) • Stop cooldown when CETs are at target temperature (actions may continue in E-3 while waiting to reach target temperature
	CRS/ATC	Ensure at least one PORV block valve open
	CREW	Reset SI if not already done per RO-1
	CREW	Reset Phase A if not already done per RO-1
	CREW	Attempt to establish IA to VC if not already done per RO-1. PCV-1228 will not open
	CRS/ATC	Secure RHR Pumps and place in auto
	CRS/ATC	Check RCP seal cooling
	CRS/ATC	Open LCV-112B and close LCV-112C
	CRS/ATC	Start one charging pump and adjust to maximum speed
	CRS/ATC	Check subcooling >60F

	CRS/ATC	Determine that normal spray is not available for depressurization
	CRS/ATC	Attempt to depressurize using PORV 456
	CRS	Transition to ECA-3.3
	CRS/ATC	Check 33 SG Level < 75% (should be < 75% at this point): • Procedure will address attempting to establish spray, aux spray or PORV
	CRS/ATC	Check PZR Level is >14%
	CRS/ATC	Check subcooling >40F
	CRS/ATC	Check >365 gpm AFW flow available for heat sink
	CRS/ATC	Check RVLIS >72%
	ATC/BOP	Secures SI Pumps and places in auto
Lead Evaluator		Terminate Scenario

Emergency Classification

ALERT: Per EAL 3.1.2 Primary system leakage exceeding capacity (75 gpm) of a single charging pump.

Turnover Information

Date/Time:	Today/Now
Condition:	Power Ops
% Power:	100%
Xenon:	Equilibrium
RCS Boron:	1040 ppm
PZR Press Control:	Channel 1
PZR Level Control:	Channel 2
RCS Total Leakage:	0.1 gpm
RCS Unidentified Leakage:	0.01 gpm
Condenser Air leakage	6 SCFM
RCS Gas activity	1.78E-2 µCi/cc
Risk Assessment:	Yellow

Plant Equipment Status:

- # 31 ABFP was declared inoperable 3 hours ago due to high vibrations during its PT (TS 3.7.5 – 72 hr AOT). Maintenance has de-coupled the pump and motor, and it is expected to returned for re-test next shift.

- PORV 455C was declared inoperable 1 hour ago due to blowing its control power fuses. T/S is in progress. Per TS 3.4.11, the block valve has been closed with power removed and a 7 day AOT entered.

Instructions:

Maintain 100% power.