PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Perform Jet Pump Operability Check

S/RO	00.SO.003.051	2	03/25/2013	Classroom
Appl To	JPM Number	Revision	Date	Setting

G	2.2.12	3.7/4.1	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/25/2013	25
Author	Date	Validation Time (min)

Validated		Approval	
[signature]	3/28/2013	Corey B [signature]	4/9/2013
Operations Instructor	Date	Nuclear Trng Supv	Date

Examinee Name: ______________________ ______________________

Last, First MI — Employee Number

Exam Date: ______________ Exam Duration (Min) ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator

______________________ ______________________

Name — Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 00.SO.003.051

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. SO-100-007, DAILY SURVEILLANCE LOG, REV 59

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. Unit 1 is operating at 100% power.

B. Both Reactor Recirc pumps and loops are in operation.

C. The necessary data to perform the daily surveillance for Recirc pump and jet pump operability has been taken and recorded on Attachment C, PERFORMANCE DATA SHEET RECIRCULATION SYSTEM DUAL LOOP, of SO-100-007, DAILY SURVEILLANCE LOG.

D. No Tech Spec LCO action statements are in effect.

V. INITIATING CUE

Using the data provided on Attachment C, PERFORMANCE DATA SHEET RECIRCULATION SYSTEM DUAL LOOP, of SO-100-007, DAILY SURVEILLANCE LOG:

- Complete the remaining items in Attachment C.
- Determine Recirc pump and jet pump operability IAW Item 1 of SO-100-007, DAILY SURVEILLANCE LOG.
- Report the results of the surveillance to your supervisor.

VI. TASK STANDARD

Recirculation pumps declared OPERABLE; Jet pumps declared INOPERABLE

VII. TASK SAFETY SIGNIFICANCE

Ensures compliance with Technical Specifications.

Appl. To/JPM No.: 00.SO.003.051 Student Name:_______________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE To begin this JPM, provide the candidate with the Task Conditions and Initiating Cue Sheet, a copy of SO-100-007, and the partially completed attachment C (labeled "Candidate's Data Sheet", 1 page).			
	EVALUATOR NOTE "Candidate's Data Sheet #2" (1 page) is not given to the candidate until they identify the need to evaluate jet pump delta Ps.			
1.	Obtain a controlled copy of SO-100-007.	Controlled copy obtained from evaluator.		
2.	Selects correct procedure section.	Selects Item 1.		
3.	To determine Recirc Pumps/Jet Pumps and Flow Biased Simulated Thermal Power Upscale (RPS) OPERABLE, Complete APPLICABLE Attachments: IF in Dual Loop Operation, Complete Attachment C. For Recirc Pumps and Jet Pumps.	Selects Attachment C.		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.SO.003.051 Student Name:________________________

Step	Action	Standard	Eval	Comments
∗4.	Recirc pumps operable if loop jet pump flow mismatch maintained within a or b: Enter N/A for item that does not apply. a. 5 Mlbm/hr with core flow ≥ 75 Mlbm/hr b. 10 Mlbm/hr with core flow < 75 Mlbm/hr	On Attachment C PERFORMANCE DATA SHEET RECIRCULATION SYSTEM DUAL LOOP: Compares line g to h. Determines that the mismatch between Loop A and Loop B is 2 Mlbm/hr. Records: 2 Mlbm/hr on SR 3.4.1.1 line a. Records: N/A on SR 3.4.1.1 line b. Determines Recirc Pumps are operable. Circles YES and places his/her initials under Confirm column on SR 3.4.1.1 line . Records: SAT on Recirc Pumps line of item 1 of SO-100-007 Daily Surveillance Log Attachment A.		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.SO.003.051 Student Name:________________________

Step	Action	Standard	Eval	Comments
∗5.	When recirc pumps operating with flow within limits of a or b above, jet pumps operable if no two (2) following conditions exist simultaneously: Recirculation loop drive flow versus recirculation generator speed differs > 10% from established patterns. (Plot applicable performance data on figures 1 and 2 of this attachment)	On Figure 1 RECIRC PUMP A FLOW VS. SPEED TWO LOOP OPERATION of ATTACHMENT C: Plots a point corresponding to: RECIRC GENERATOR A SPEED (SI 14032A) of 87% AND RECIRC PUMP A FLOW (KGPM) of 38 KGPM On Figure 2 RECIRC PUMP B FLOW VS. SPEED TWO LOOP OPERATION of ATTACHMENT C: Plots a point corresponding to: RECIRC GENERATOR B SPEED (SI 14032B) of 88% AND RECIRC PUMP B FLOW (KGPM) of 33 KGPM Circles YES and places his/her initials under Confirm column SR 3.4.2.1 line a.		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.SO.003.051 Student Name:________________________

Step	Action	Standard	Eval	Comments
∗6.	Recirculation loop drive flow versus total core flow differs > 10% from established patterns. (Plot applicable performance data on Figures 3 and 4 of this attachment)	On Figure 3 TOTAL CORE FLOW VS. RECIRC PUMP A FLOW TWO LOOP OPERATION of ATTACHMENT C: Plots a point corresponding to: RECIRC PUMP A FLOW (KGPM) (FR-B31-1R614) of 38 KGPM AND TOTAL CORE FLOW MLB/HR of 92 MLB/HR On Figure 4 TOTAL CORE FLOW VS. RECIRC PUMP B FLOW TWO LOOP OPERATION of ATTACHMENT C Plots a point corresponding to: RECIRC PUMP A FLOW (KGPM) (FR-B31-1R614) of 33 KGPM AND TOTAL CORE FLOW MLB/HR of 92 MLB/HR Circles NO and places his/her initials under Confirm column SR 3.4.2.1 line b.		

Appl. To/JPM No.: 00.SO.003.051 Student Name:________________________

Step	Action	Standard	Eval	Comments
7.	Notifies Reactor Engineering directly that surveillance parameters differ from established values by more than 5% or notifies SRO to contact Reactor Engineering. **EVALUATOR CUE** Role-play Reactor Engineering, SRO, or Operator and acknowledge the report. **EVALUATOR CUE** Provide the candidate with the Candidate Data Sheet #2 (1 page) (Jet pump delta Ps).	Contacts Reactor Engineering directly and notifies that surveillance parameters differ from established values by more than 5%. OR Notifies SRO to contact Reactor Engineering. OR Contacts Operator to get additional Jet Pump data.		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.SO.003.051 Student Name:________________________

Step	Action	Standard	Eval	Comments
8.	Calculates LOOP A JET PUMP ΔP PERCENT DEVIATION FROM THE AVERAGE to be used in Plotting applicable performance data on figure 1 of attachment I. **EVALUATOR NOTE** The candidate may round these numbers to the nearest tenth.	Records the following data on Attachment C LOOP A JET PUMP ΔP PERCENT DEVIATION FROM THE AVERAGE: 1. JP11_**34**_[(JP11 - A) ÷ A] X 100 =_**-.87**_ 2. JP12_**35**_[(JP12 - A) ÷ A] X 100=_**2.04**_ 3. JP13_**34**_[(JP13 - A) ÷ A] X 100=_**-.87**_ 4. JP14_**35**_[(JP14 - A) ÷ A] X 100 =_**2.04**_ 5. JP15_**35**_[(JP15 - A) ÷ A] X 100 =_**2.04**_ 6. JP16_**35**_[(JP16 - A) ÷ A] X 100 =_**2.04**_ 7. JP17_**34**_[(JP17 - A) ÷ A] X 100 =_**-.87**_ 8. JP18_**34**_[(JP18 - A) ÷ A] X 100 =_**-.87**_ 9. JP19_**35**_[(JP19 - A) ÷ A] X 100 =_**2.04**_ 10. JP20_**32**_[(JP20 - A) ÷ A] X 100 =_**-6.71**_ A =_**343** X 0.1 = _**34.3**_ (Sum of ΔP%) JP11 thru 20		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.SO.003.051 Student Name:_______________

Step	Action	Standard	Eval	Comments
9.	Calculates LOOP B JET PUMP ΔP PERCENT DEVIATION FROM THE AVERAGE to be used in Plotting applicable performance data on figure 2 of attachment I. **EVALUATOR NOTE** The candidate may round these numbers to the nearest tenth.	Records the following data on Attachment C LOOP B JET PUMP ΔP PERCENT DEVIATION FROM THE AVERAGE: 1. JP1_**39**_[(JP1 - A) ÷ A] X 100 =_**3.17**_ 2. JP2_**39**_[(JP2 - A) ÷ A] X 100 =_**3.17**_ 3. JP3_**37**_[(JP3 - A) ÷ A] X 100 =_**-2.12**_ 4. JP4_**39**_[(JP4 - A) ÷ A] X 100 =_**3.17**_ 5. JP5_**39**_[(JP5 - A) ÷ A] X 100 =_**3.17**_ 6. JP6_**39**_[(JP6 - A) ÷ A] X 100 =_**3.17**_ 7. JP7_**30**_[(JP7 - A) ÷ A] X 100 =_**-20.63**_ 8. JP8_**39**_[(JP8 - A) ÷ A] X 100 =_**3.17**_ 9. JP9_**39**_[(JP9 - A) ÷ A] X 100 =_**3.17**_ 10. JP10_**38**_[(JP10 - A) ÷ A] X 100 =_**.53**_ A =_**378** X 0.1 = _**37.8**_ (Sum of ΔP%) JP1 thru 10		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.SO.003.051 Student Name:________________________

Step	Action	Standard	Eval	Comments
✱10.	Each jet pump to lower plenum differential pressure differs by > 20% from the established patterns, (Plot applicable performance data on figures 1 and 2 of attachment I. **EVALUATOR NOTE** Plotting of points is not critical in this step.	On Figure 1 TWO LOOP JET PUMP DISTRIBUTION LOOP A of ATTACHMENT I Plots the following points: **JP11** and **-.87** % DEVIATION FROM THE MEAN DELTA P VALUE **JP12** and **2.04** % DEVIATION FROM THE MEAN DELTA P VALUE **JP13** and **-.87** % DEVIATION FROM THE MEAN DELTA P VALUE **JP14** and **2.04** % DEVIATION FROM THE MEAN DELTA P VALUE **JP15** and **2.04** % DEVIATION FROM THE MEAN DELTA P VALUE **JP16** and **2.04** % DEVIATION FROM THE MEAN DELTA P VALUE **JP17** and **-.87** % DEVIATION FROM THE MEAN DELTA P VALUE **JP18** and **-.87** % DEVIATION FROM THE MEAN DELTA P VALUE **JP19** and **2.04** % DEVIATION FROM THE MEAN DELTA P VALUE **JP20** and **–6.71** % DEVIATION FROM THE MEAN DELTA P VALUE Determines that all points are within ±20% from the established patterns. ✱		

✱Critical Step #Critical Sequence

Appl. To/JPM No.: 00.SO.003.051 Student Name:_______________________

Step	Action	Standard	Eval	Comments
✱10. (cont)	Each jet pump to lower plenum differential pressure differs by > 20% from the established patterns, (Plot applicable performance data on figures 1 and 2 of attachment I. **EVALUATOR NOTE** Plotting of points is not critical in this step.	On Figure 2 TWO LOOP JET PUMP DISTRIBUTION LOOP B of ATTACHMENT I Plots the following points: **JP1** and **3.17** % DEVIATION FROM THE MEAN DELTA P VALUE **JP2** and **3.17** % DEVIATION FROM THE MEAN DELTA P VALUE **JP3** and **–2.12** % DEVIATION FROM THE MEAN DELTA P VALUE **JP4** and **3.17** % DEVIATION FROM THE MEAN DELTA P VALUE **JP5** and **3.17** % DEVIATION FROM THE MEAN DELTA P VALUE **JP6** and **3.17** % DEVIATION FROM THE MEAN DELTA P VALUE **JP7** and **–20.63** % DEVIATION FROM THE MEAN DELTA P VALUE **JP8** and **3.17** % DEVIATION FROM THE MEAN DELTA P VALUE **JP9** and **3.17** % DEVIATION FROM THE MEAN DELTA P VALUE **JP10** and **.53** % DEVIATION FROM THE MEAN DELTA P VALUE Determines that jet pump 7 is NOT within $\pm$20% from the established patterns. ✱ Circles YES and places his/her initials under Confirm column SR 3.4.2.1 line c. ✱		

✱Critical Step #Critical Sequence

Appl. To/JPM No.: 00.SO.003.051 Student Name:_______________

Step	Action	Standard	Eval	Comments
✱11.	When recirc pumps operating with flow within limits of a or b above, jet pumps operable if no two (2) following conditions exist simultaneously: **EVALUATOR CUE:** This completes the JPM.	Determines Jet pumps are NOT operable based on two (2) of the conditions under SR 3.4.2.1 not being met simultaneously. Circles NO and places his/her initials under Confirm column SR 3.4.2.1. Records: UNSAT on Jet Pumps line of item 1 of SO-100-007 Daily Surveillance Log Attachment A.		

✱Critical Step #Critical Sequence

ACCEPTANCE CRITERIA for DUAL LOOP	ACCEPTABLE	CONFIRM
SR 3.4.1.1 Recirc Pumps **OPERABLE** if loop jet pump flow mismatch maintained within a or b: **Enter** NA for item that does not apply.	YES/NO	Initials
a. 5 Mlbm/hr with core flow ≥ 75 Mlbm/hr.	2 Mlbm/hr.	
b. 10 Mlbm/hr with Core Flow < 75 Mlbm/hr.	N/A Mlbm/hr.	
SR 3.4.2.1 When recirc pumps operating with flow within limits of a or b above, Jet Pumps **OPERABLE** if no two (2) following conditions exist simultaneously:	YES/NO	Initials
	AS FOUND	

☐ NOTE: IF any of these conditions exist, or, IF any parameter differs by more than 5% of established value, **Notify** System Engineering.

a. Recirculation loop drive flow versus recirculation generator speed differs > 10% from established patterns. (**Plot** applicable performance data on Figures 1 and 2 of this attachment.)	YES/NO	Initials
b. Recirculation loop drive flow versus total core flow differs > 10% from established patterns. (**Plot** applicable performance data on Figures 3 and 4 of this attachment.)	YES/NO	Initials

☐ NOTE: **Perform ONLY IF** a or b above fail. **Record** applicable data on pages 3 and 4 of this attachment.

c. Any jet pump to lower plenum differential pressure differs by ≥ 20% from established patterns, (**Plot** applicable performance data on Figures 1 and 2 of attachment I.)	YES/NO/NA	Initials

LOOP A

JET PUMP ΔP PERCENT DEVIATION FROM THE AVERAGE

A = Average Jet Pump ΔP Loop A (Calculate below)

		JP ΔP%	% JP ΔP Dev.		
1.	JP11	34	[(JP11 - A) ÷ A] X 100 =	-0.87	PLOT ON FIG. 1 ATTACHMENT I
2.	JP12	35	[(JP12 - A) ÷ A] X 100 =	2.04	
3.	JP13	34	[(JP13 - A) ÷ A] X 100 =	-0.87	
4.	JP14	35	[(JP14 - A) ÷ A] X 100 =	2.04	
5.	JP15	35	[(JP15 - A) ÷ A] X 100 =	2.04	
6.	JP16	35	[(JP16 - A) ÷ A] X 100 =	2.04	
7.	JP17	34	[(JP17 - A) ÷ A] X 100 =	-0.87	
8.	JP18	34	[(JP18 - A) ÷ A] X 100 =	-0.87	
9.	JP19	35	[(JP19 - A) ÷ A] X 100 =	2.04	
10.	JP20	32	[(JP20 - A) ÷ A] X 100 =	-6.71	

A = 343 X 0.1 = 34.3
(Sum of ΔP%)
JP11 thru 20

LOOP B

JET PUMP ΔP PERCENT DEVIATION FROM THE AVERAGE

B = Average Jet Pump ΔP Loop B (Calculate below)

		JP ΔP%	% JP ΔP Dev.		
1.	JP1	39	[(JP1 - B) ÷ B] X 100 =	3.17	PLOT ON FIG. 2 ATTACHMENT I
2.	JP2	39	[(JP2 - B) ÷ B] X 100 =	3.17	
3.	JP3	37	[(JP3 - B) ÷ B] X 100 =	-2.12	
4.	JP4	39	[(JP4 - B) ÷ B] X 100 =	3.17	
5.	JP5	39	[(JP5 - B) ÷ B] X 100 =	3.17	
6.	JP6	39	[(JP6 - B) ÷ B] X 100 =	3.17	
7.	JP7	30	[(JP7 - B) ÷ B] X 100 =	-20.63	
8.	JP8	39	[(JP8 - B) ÷ B] X 100 =	3.17	
9.	JP9	39	[(JP9 - B) ÷ B] X 100 =	3.17	
10.	JP10	38	[(JP10 - B) ÷ B] X 100 =	0.53	

B = 378 X 0.1 = 37.8
(Sum of ΔP%)
JP1 thru 10

FIGURE 1
RECIRC PUMP A FLOW VS. SPEED
TWO LOOP OPERATION

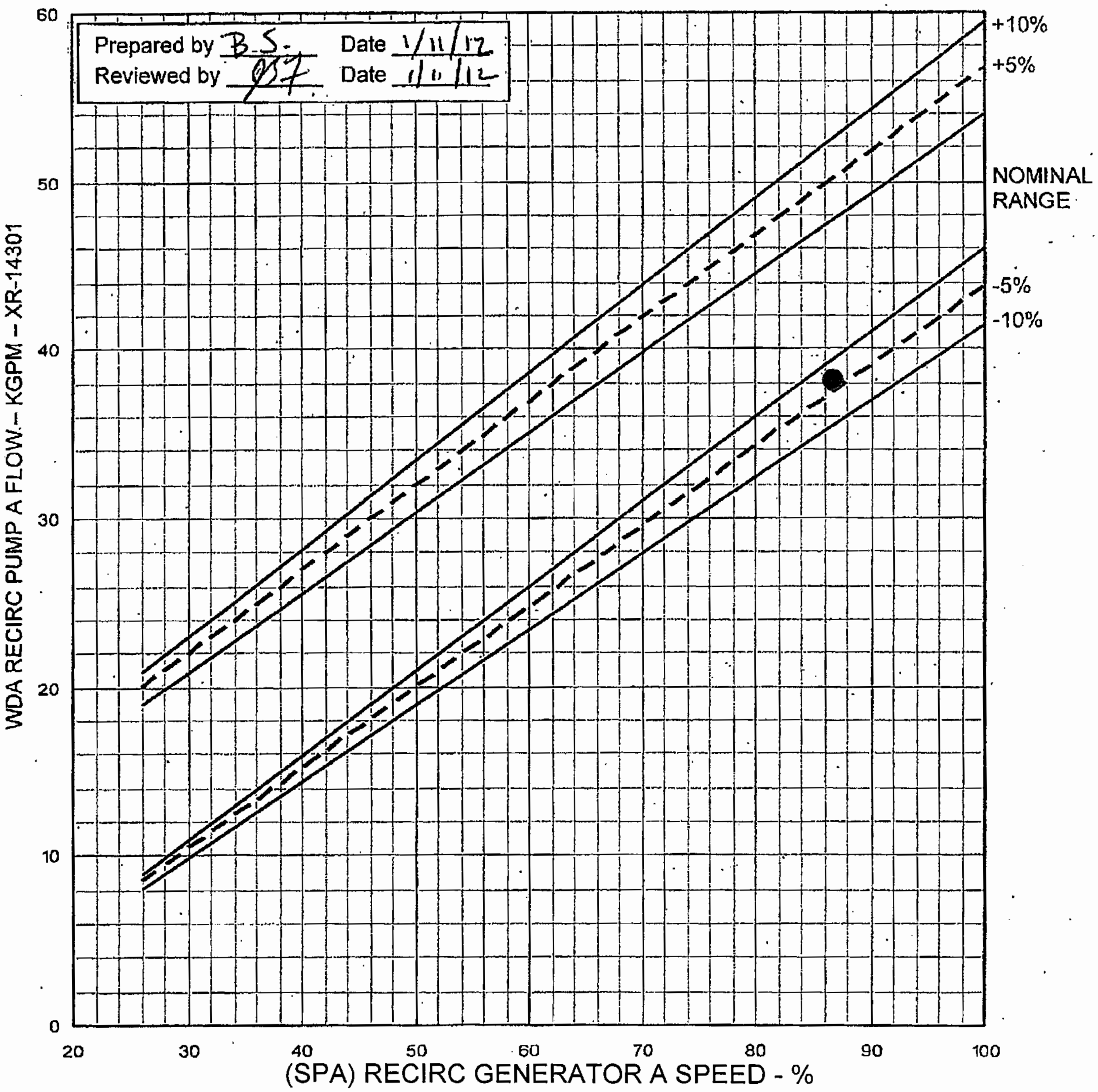
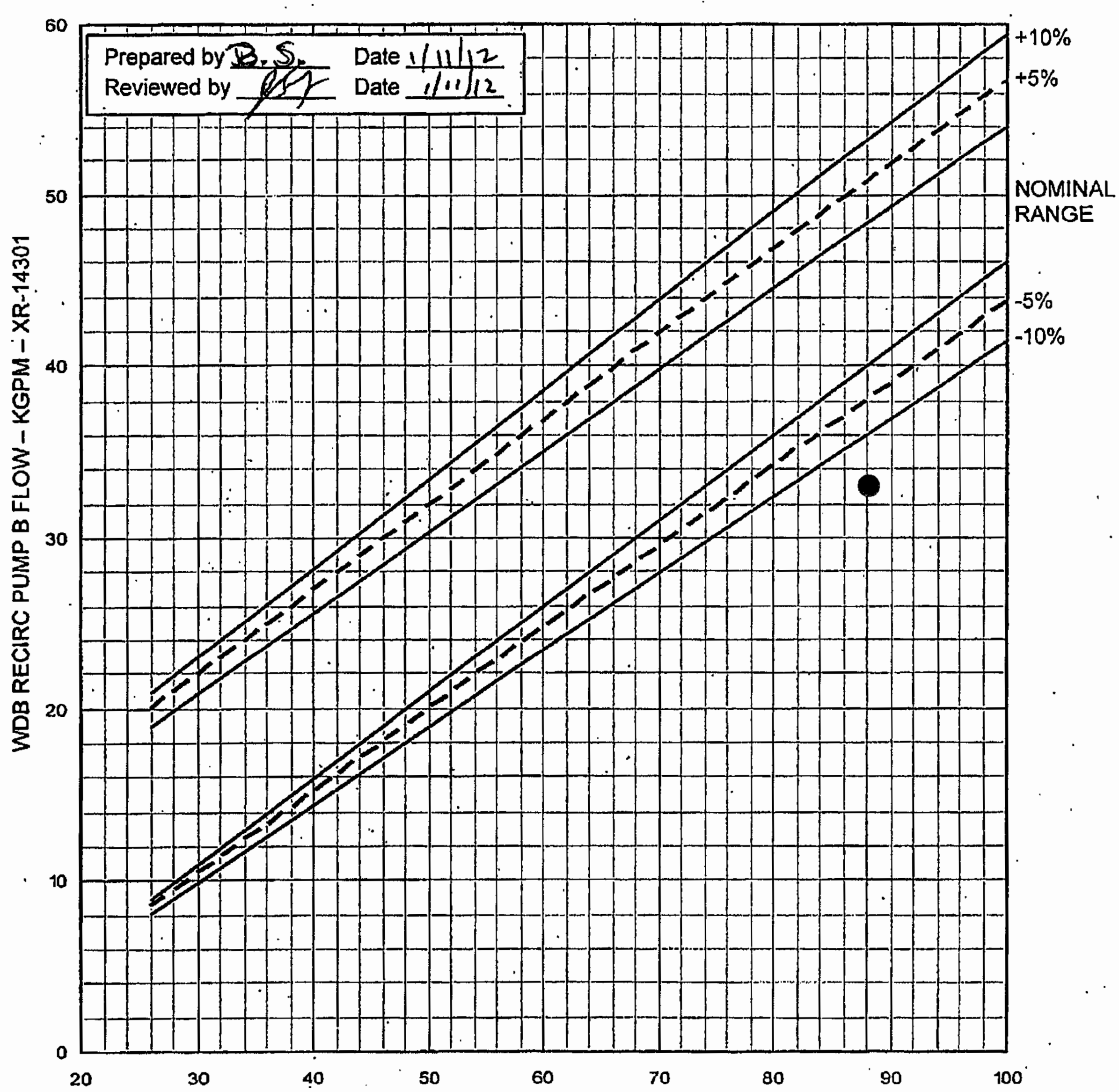


FIGURE 2
RECIRC PUMP B FLOW VS. SPEED



TWO LOOP OPERATION

(SPB) RECIRC GENERATOR B SPEED - %

FIGURE 3
TOTAL CORE FLOW VS. RECIRC PUMP A FLOW
TWO LOOP OPERATION

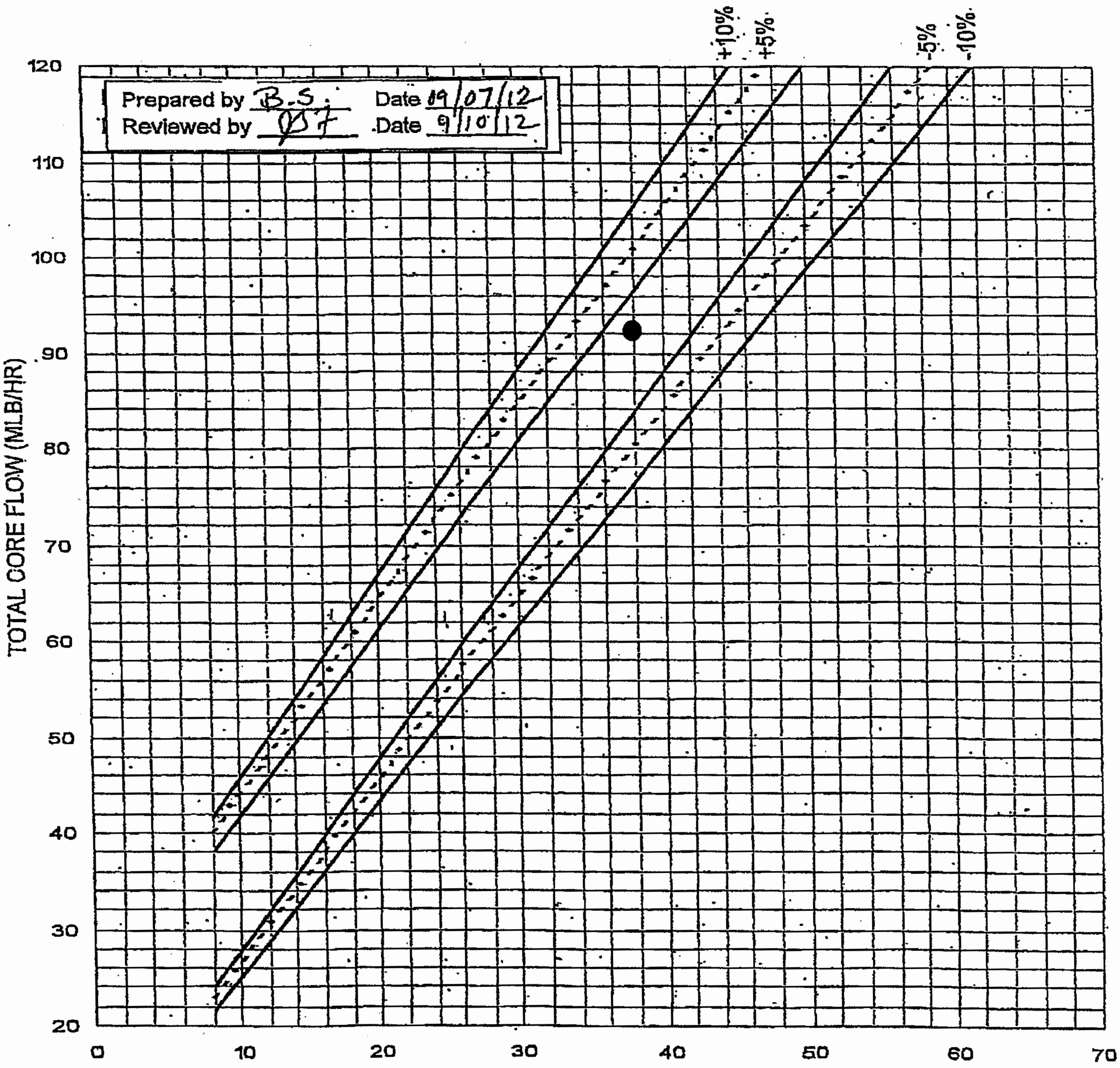


FIGURE 4
TOTAL CORE FLOW VS. RECIRC PUMP B FLOW
TWO LOOP OPERATION

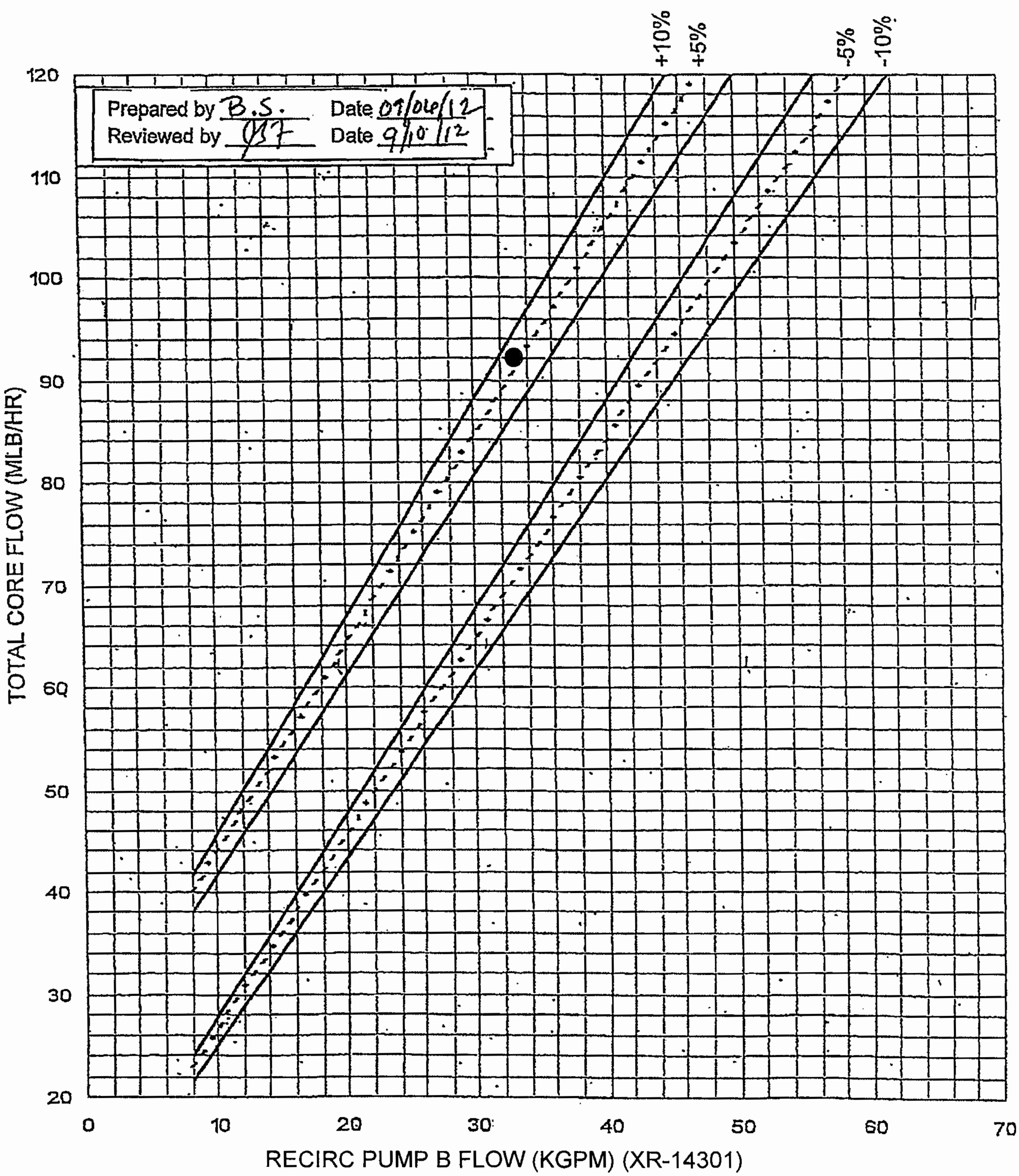


FIGURE 1
TWO LOOP JET PUMP DISTRIBUTION LOOP A
(CONTINUOUS USE)

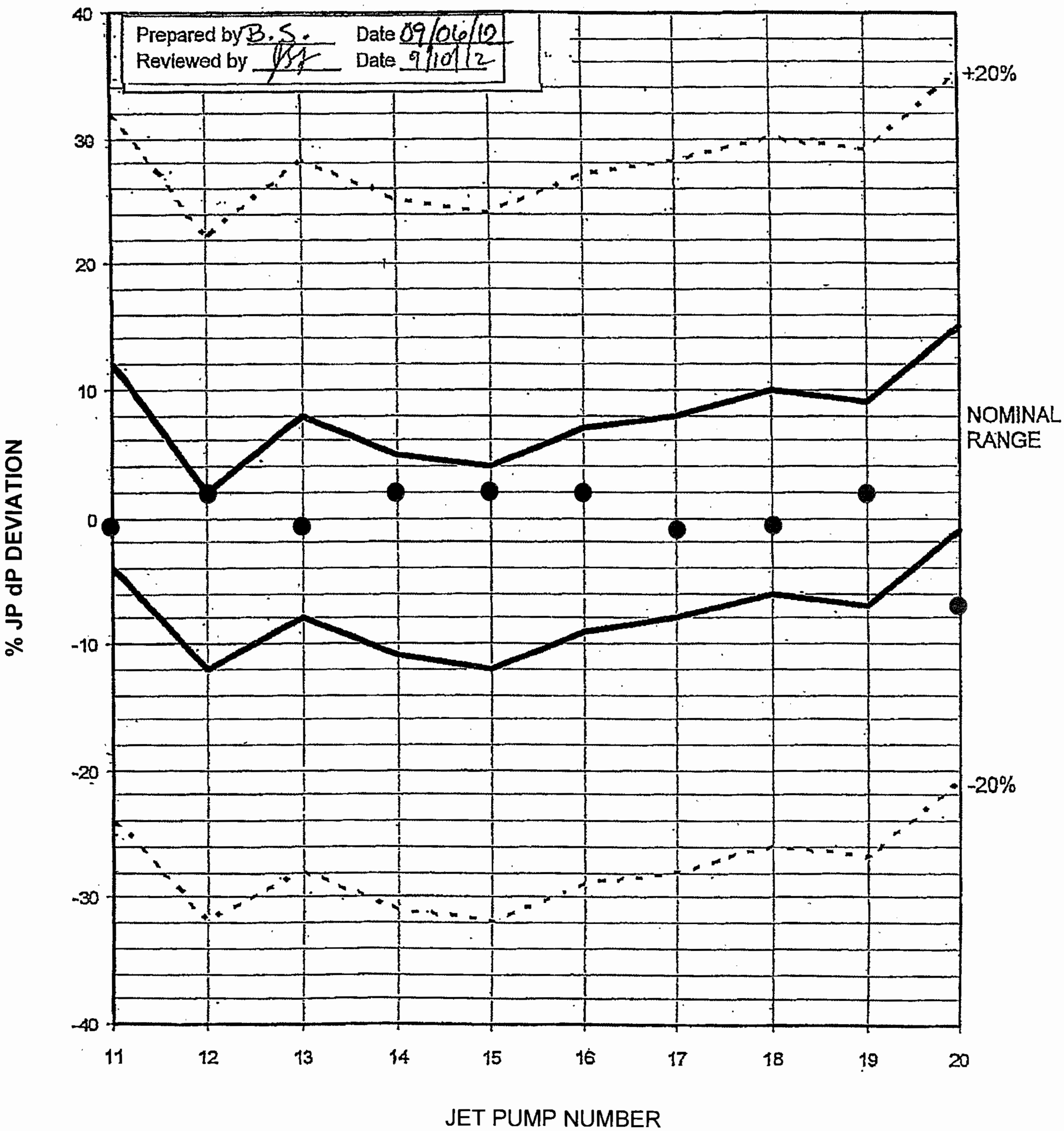
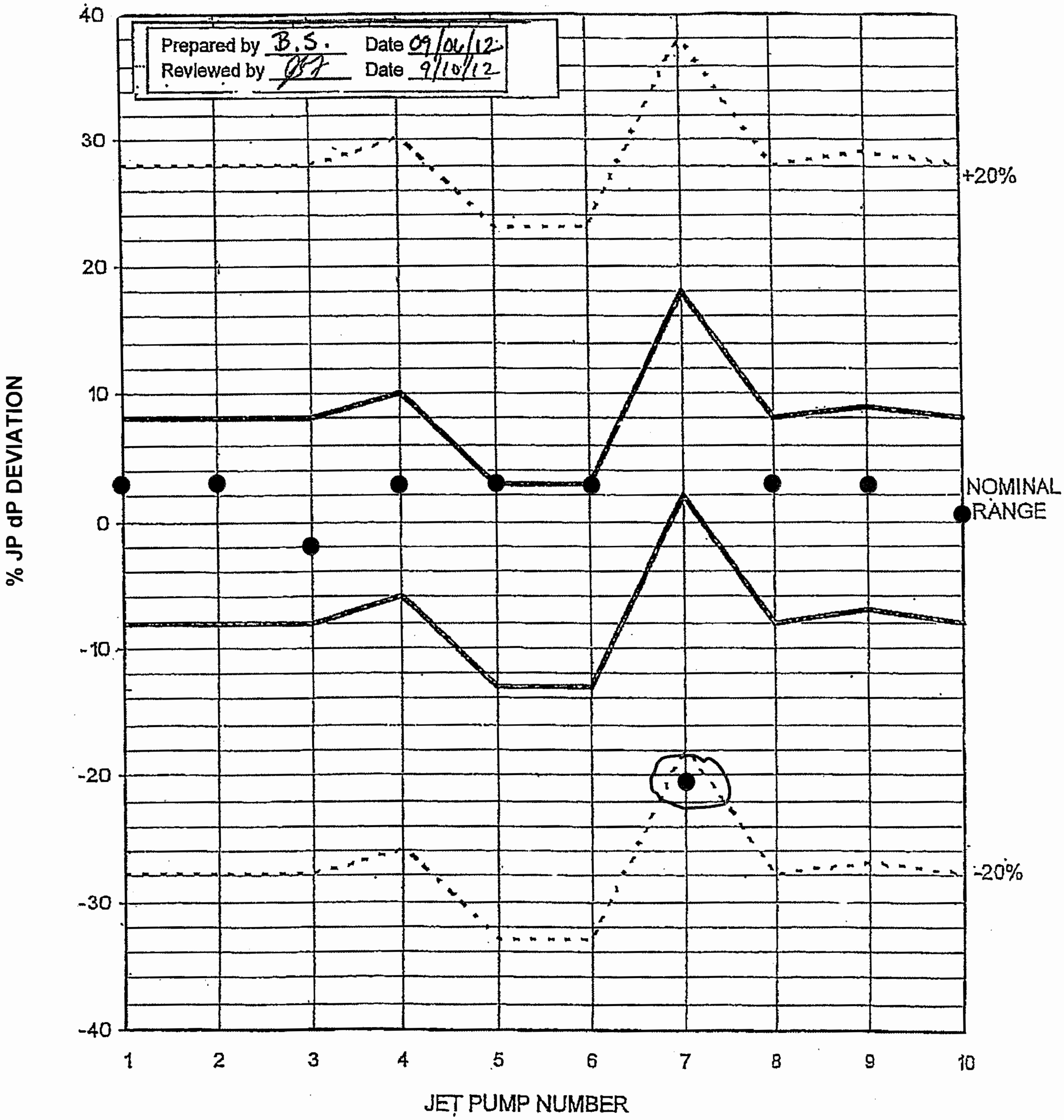


FIGURE 2
TWO LOOP JET PUMP DISTRIBUTION LOOP B



Candidate's Data Sheet #2 (Pg 1 of 1)

TASK CONDITIONS

A. Unit 1 is operating at 100% power.

B. Both Reactor Recirc pumps and loops are in operation.

C. The necessary data to perform the daily surveillance for Recirc pump and jet pump operability has been taken and recorded on Attachment C, PERFORMANCE DATA SHEET RECIRCULATION SYSTEM DUAL LOOP, of SO-100-007, DAILY SURVEILLANCE LOG.

D. No Tech Spec LCO action statements are in effect.

INITIATING CUE

Using the data provided on Attachment C, PERFORMANCE DATA SHEET RECIRCULATION SYSTEM DUAL LOOP, of SO-100-007, DAILY SURVEILLANCE LOG:

- Complete the remaining items in Attachment C.
- Determine Recirc pump and jet pump operability IAW Item 1 of SO-100-007, DAILY SURVEILLANCE LOG.
- Report the results of the surveillance to your supervisor.

Candidate's Data Sheet #2 (Pg 1 of 1)

TASK CONDITIONS

A. Unit 1 is operating at 100% power.

B. Both Reactor Recirc pumps and loops are in operation.

C. The necessary data to perform the daily surveillance for Recirc pump and jet pump operability has been taken and recorded on Attachment C, PERFORMANCE DATA SHEET RECIRCULATION SYSTEM DUAL LOOP, of SO-100-007, DAILY SURVEILLANCE LOG.

D. No Tech Spec LCO action statements are in effect.

INITIATING CUE

Using the data provided on Attachment C, PERFORMANCE DATA SHEET RECIRCULATION SYSTEM DUAL LOOP, of SO-100-007, DAILY SURVEILLANCE LOG:

- Complete the remaining items in Attachment C.
- Determine Recirc pump and jet pump operability IAW Item 1 of SO-100-007, DAILY SURVEILLANCE LOG.
- Report the results of the surveillance to your supervisor.

PERFORMANCE DATA SHEET
RECIRCULATION SYSTEM DUAL LOOP
(CONTINUOUS USE)

☐ NOTE: The data collection steps in this attachment may be performed in any order.

Record following data:

	PARAMETER/INSTRUMENT		PANEL	READING	
a.	GEN 1A SPEED	Primary: SI-14032A	1C651	87	%
		Alternate: SI-14375A	0C630	1460	RPM
		(Note 1)		87	%
b.	GEN 1B SPEED	Primary: SI-14032B	1C651	88	%
		Alternate: SI-14375B	0C630	1480	RPM
		(Note 1)		88	%
c.	RECIRC DRIVE FLOW A	Primary: XR-14301	1C652	38	Kgpm
		Alternate: FI-B31-1R617			
d.	RECIRC DRIVE FLOW B	Primary: XR-14301	1C652	33	Kgpm
		Alternate: FI-B31-1R613			
e.	TOTAL CORE FLOW	Primary: NJF01B	1C652	92	Mlb/hr
		Alternate: XR-14301			
f.	CORE PLATE DP	XR-14301	1C652	53	%
g.	LOOP A JET PP FLOW	FI-B21-1R611A	1C652	45	Mlb/hr
h.	LOOP B JET PP FLOW	FI-B21-1R611B	1C652	47	Mlb/hr

I.	JET PUMP DELTA P'S	JET PUMP INST PANEL 1C619 UPPER RELAY ROOM

☐ NOTE: It is only necessary to record Jet Pump Delta P data if it is required to complete the evaluation of SR 3.4.2.1 criteria c on page 2 of this attachment.

JP1	____ %	JP2	____ %	JP3	____ %	JP4	____ %	JP5	____ %
JP6	____ %	JP7	____ %	JP8	____ %	JP9	____ %	JP10	____ %
JP11	____ %	JP12	____ %	JP13	____ %	JP14	____ %	JP15	____ %
JP16	____ %	JP17	____ %	JP18	____ %	JP19	____ %	JP20	____ %

Continue Recirc Pump/Jet Pump OPERABILITY determination on page 2 of this Form using data above.

NOTE (1): Convert RPM to % using the following: RPM/1680 x 100 = % Pump Speed

Candidate's Data Sheet #2 (Pg 1 of 1)

PERFORMANCE DATA SHEET
RECIRCULATION SYSTEM DUAL LOOP
(CONTINUOUS USE)

☐ NOTE: The data collection steps in this attachment may be performed in any order.

Record following data:

	PARAMETER/INSTRUMENT		PANEL	READING	
a.	GEN 1A SPEED	Primary: SI-14032A	1C651	87	%
		Alternate: SI-14375A	0C630	1460	RPM
		(Note 1)		87	%
b.	GEN 1B SPEED	Primary: SI-14032B	1C651	88	%
		Alternate: SI-14375B	0C630	1480	RPM
		(Note 1)		88	%
c.	RECIRC DRIVE FLOW A	Primary: XR-14301	1C652	38	Kgpm
		Alternate: FI-B31-1R617			
d.	RECIRC DRIVE FLOW B	Primary: XR-14301	1C652	33	Kgpm
		Alternate: FI-B31-1R613			
e.	TOTAL CORE FLOW	Primary: NJF01B	1C652	92	Mlb/hr
		Alternate: XR-14301			
f.	CORE PLATE DP	XR-14301	1C652	53	%
g.	LOOP A JET PP FLOW	FI-B21-1R611A	1C652	45	Mlb/hr
h.	LOOP B JET PP FLOW	FI-B21-1R611B	1C652	47	Mlb/hr

I. JET PUMP DELTA P'S — JET PUMP INST PANEL 1C619 UPPER RELAY ROOM

☐ NOTE: It is only necessary to record Jet Pump Delta P data if it is required to complete the evaluation of SR 3.4.2.1 criteria c on page 2 of this attachment.

JP1	39 %	JP2	39 %	JP3	37 %	JP4	39 %	JP5	39 %
JP6	39 %	JP7	30 %	JP8	39 %	JP9	39 %	JP10	38 %
JP11	34 %	JP12	35 %	JP13	34 %	JP14	35 %	JP15	35 %
JP16	35 %	JP17	34 %	JP18	34 %	JP19	35 %	JP20	32 %

Continue Recirc Pump/Jet Pump OPERABILITY determination on page 2 of this Form using data above.

NOTE (1): Convert RPM to % using the following: RPM/1680 x 100 = % Pump Speed

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title Activate Fire Brigade

RO	13.ON.003.001	4	01/29/2013	Simulator
Appl To	JPM Number	Revision	Date	Setting

G	2.4.27	3.4	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	01/29/2013	15
Author	Date	Validation Time (min)

Validated / Approval

	3/28/2013		4/9/2013
Operations Instructor	Date	Nuclear Trng Supv	Date

Examinee Name: ______________________ ______________

Last, First MI Employee Number

Exam Date: ____________ Exam Duration (Min) ____________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator

Name Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
RO 13.ON.003.001

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. ON-013-001, RESPONSE TO FIRE (REV. 34)

B. FP-013-189, DIESEL GENERATOR BAY A ZONE 0-41A (REV. 4)

C. AR-SP-001 (REV. 16)

D. AR-SP-002 (REV. 20)

E. OP-099-004 (REV. 4)

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. A fire alarm has been received for the “A” Diesel Generator building.

B. The following VALID SIMPLEX data print out is available:

FIRE DET X116_Z5 ALM

17:14	THURS	16-MAY-13
44-660	A DIESEL GEN	

FIRE DET X116_Z1 ALM

17:16	THURS	16-MAY-13
44-677/710	A DG	

FIRE SUP X250_ZI ALM

17:20	THURS	16-MAY-13
44-676	PA011	A DIESL

C. An NPO confirms that a fire does exist in the “A” Diesel Generator building.

V. INITIATING CUE

Activate the Fire Brigade and select the appropriate Pre-Fire Plan.

VI. TASK STANDARD

Fire Brigade activated and Pre-Fire Plan FP-013-189 selected.

VII. TASK SAFETY SIGNIFICANCE

Response to a fire is important to minimize damage to the station. Fire events are a significant contributor to CDF/LERF and must be contained as quickly as possible. The Control Room is responsible for initiating firefighting activities to ensure this is accomplished.

PERFORMANCE CHECKLIST

Appl. To: RO JPM No.: 13.ON.003.001 Student Name:

Step	Action	Standard	Eval	Comments

	EVALUATOR NOTE
	• This JPM must be done in the simulator or plant control room.
	• Ensure the following material is available to support performance of this JPM:
	  o ON-013-001
	  o Pre-Fire Plans
	  o AR-SP-001
	  o AR-SP-002
	• Provide the candidate with the Task Conditions/Initiating Cue Sheet.			

1.	Obtain SIMPLEX fire alarm panel alarm responses and ON-013-001. **EVALUATOR NOTE** Though not required, candidate may refer to OP-013-002 for the Simplex panel. ON-013-001 Attachment L may be obtained near the SIMPLEX alarm response procedures.	Obtains controlled copies of the following as required: • AR-SP-001 • AR-SP-002 • ON-013-001		

PERFORMANCE CHECKLIST

Appl. To: RO JPM No.: 13.ON.003.001 Student Name: ____________

Step	Action	Standard	Eval	Comments
2.*	Determines appropriate Pre-Fire Plan. **EVALUATOR NOTE** The alarm response procedures identify Pre-Fire Plan FP-013-189. **EVALUATOR NOTE** This may be completed later in the JPM based on executing ON-013-001 Attachment L. The remaining JPM steps are from ON-013-001 Attachment L.	Determines Pre-Fire Plan FP-013-189 is to be used.		
3.	Record Date and Time of fire notification.	Records Date and Time of fire notification.		
4.*	Dispatch Fire Brigade Leader to area of reported fire. **EVALUATOR CUE** Role-play as Fire Brigade Leader. Inform the candidate you will be using OPS Channel 1 and setting up the command post at Control Structure Central Area access. Request Fire Engine setup on road East of A through D Diesels. Request additional off-site fire department support.	Dispatches Fire Brigade Leader to the "A" Diesel Generator building using the plant page or radio.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: RO JPM No.: 13.ON.003.001 Student Name:

Step	Action	Standard	Eval	Comments
5.*	Sound Fire Alarm for ~ 10 seconds. **EVALUATOR NOTE** Though not required, candidate may refer to OP-099-004 Att. B Hard Card located in 0C695 for operation of the Plant Alarm System. If another candidate is performing a parallel JPM in the simulator, direct your candidate to simulate actions necessary to sound the fire alarm. This is done for exam security purposes.	At panel 0C695: • Pulls out the Pistol Grip EVACUATION ALARM switch, and turns to 'PLANT ALARM' position.* • Turns the SIREN TONE GENERATOR "FIRE" position.* • Pushes in the Pistol Grip EVACUATION ALARM switch.* • After ~10 seconds, pulls out the Pistol Grip EVACUATION ALARM switch.* • Rotates the Pistol Grip EVACUATION ALARM switch to 'OFF' position and pushes it in.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: RO JPM No.: 13.ON.003.001 Student Name: ______

Step	Action	Standard	Eval	Comments
6.*	Make plant page announcement. Example: "ATTENTION ALL PERSONNEL: THERE IS A FIRE IN (UNIT/BUILDING/ELEVATION/AREA AND ROOM/AREA NAME IF APPROPRIATE). STATION FIRE BRIGADE HAS BEEN ACTIVATED; STAY CLEAR OF AFFECTED AREAS." **EVALUATOR NOTE** If another candidate is performing a parallel JPM in the simulator, direct your candidate to simulate actions necessary to use the page. This is done for exam security purposes.	Keys the plant page and announces: "Attention all personnel: There is a fire in the 'A' Diesel Generator Building. Station Fire Brigade has been activated. Stay clear of affected areas (or similar)."		
7.	Repeat announcement.	Keys the plant page and announces: "Attention all personnel: There is a fire in the 'A' Diesel Generator Building. Station Fire Brigade has been activated. Stay clear of affected areas (or similar)."		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: RO JPM No.: 13.ON.003.001 Student Name:

Step	Action	Standard	Eval	Comments
8.	Fire Brigade Leader reports location of Command Post, fire brigade shed (or fire engine) and radio channel to be used. **EVALUATOR CUE** If necessary, repeat cue from JPM step 4: Role-play as Fire Brigade Leader. Inform the candidate you will be using OPS Channel 1 and setting up the command post at the Control Structure Central Area access on the east side. Request Fire Engine setup on road East of A through D Diesels. Request additional off-site fire department support.	Records radio channel and location fire shed/engine to be used.		
9.*	Activate the Fire Brigade pagers using the central desk phoneset by pressing blue button and lifting the handset for at least 30 seconds. **EVALUATOR CUE** Role play as all four Fire Brigade members ready to receive the message on the radio.	On central desk phoneset, presses blue button and lifts the handset for at least 30 seconds.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: RO JPM No.: 13.ON.003.001 Student Name:

Step	Action	Standard	Eval	Comments
10.*	Report the following to the Fire Brigade members: 1. Location of fire and Command Post 2. Fire Brigade shed location, or drive fire engine to specific location. Members to dress out and report to Command Post. 3. Radio Channel (N/A if already on channel 1)	Reports to the Fire Brigade members: 1. Fire location is "A" Diesel Generator building and command post is at Control Structure Central Area access on the east side.* 2. Locate Fire Engine on road East of A through D Diesels. 3. Radio channel is OPS Channel 1.		
11.*	Direct a Fire Brigade Member to take Pre-Fire plan for the applicable building to the Command Post. **EVALUATOR CUE** Role play as Fire Brigade Member and state that you will ensure the Fire Pre-plan procedure is at the command post.	Directs a Fire Brigade Member to take Pre-Fire Plan FP-013-189 to the Command Post.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: RO JPM No.: 13.ON.003.001 Student Name: ____________

Step	Action	Standard	Eval	Comments
12.*	Inform Security (X3114 or X3115) of fire and OPS radio channel being used. **EVALUATOR CUE** Role play as security. **EVALUATOR CUE** This completes the JPM. **EVALUATOR** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	Dials extension 3114 or 3115 and informs Security of fire, that OPS Channel 1 is being used, and that offsite assistance is being requested.		

* = Critical Step
\# = Critical Sequence

TASK CONDITIONS

A. A fire alarm has been received for the "A" Diesel Generator building.

B. The following VALID SIMPLEX data print out is available:

FIRE DET X116_Z5 ALM

17:14	THURS	16-MAY-13
44-660	A DIESEL GEN	

FIRE DET X116_Z1 ALM

17:16	THURS	16-MAY-13
44-677/710	A DG	

FIRE SUP X250_ZI ALM

17:20	THURS	16-MAY-13
44-676	PA011	A DIESL

C. An NPO confirms that a fire does exist in the "A" Diesel Generator building.

INITIATING CUE

Activate the Fire Brigade and select the appropriate Pre-Fire Plan.

TASK CONDITIONS

A. A fire alarm has been received for the “A” Diesel Generator building.

B. The following VALID SIMPLEX data print out is available:

FIRE DET X116_Z5 ALM

17:14	THURS	16-MAY-13
44-660	A DIESEL GEN	

FIRE DET X116_Z1 ALM

17:16	THURS	16-MAY-13
44-677/710	A DG	

FIRE SUP X250_ZI ALM

17:20	THURS	16-MAY-13
44-676	PA011	A DIESL

C. An NPO confirms that a fire does exist in the “A” Diesel Generator building.

INITIATING CUE

Activate the Fire Brigade and select the appropriate Pre-Fire Plan.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title Calculate Drywell Leakage

S/RO	00.AD.037.051	1	03/25/2013	Classroom
Appl To	JPM Number	Revision	Date	Setting

G	2.1.7	4.4/4.7	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/25/2013	15/25
Author	Date	Validation Time (min)

Validated / Approval

[signature]	3/28/2013	Corey B [signature]	4/9/2013
Operations Instructor	Date	Nuclear Trng Supv	Date

Examinee Name: ______________________ ______________

Last, First MI Employee Number

Exam Date: ____________ Exam Duration (Min) ____________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________

Name Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 00.AD.037.051

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. SO-100-006, SHIFTLY SURVEILLANCE OPERATING LOG (REV 85)

B. TS 3.4.4, RCS OPERATIONAL LEAKAGE

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. Unit 1 is operating at 100% power.

B. Sometime during the past 24 hours, Drywell sump in-leakage began rising.

C. It is 0900 hours and time to perform SO-100-006, SHIFTLY SURVEILLANCE OPERATING LOGS.

D. The following table shows the data used in the last RCS leakage calculations (2100) and the current data (0900):

Parameter	2100	0900
Total number of times Level rises LR/FR-16103 Sump A	2	6
Total number of times Level rises LR/FR-16103 Sump B	2	5
Total percent rise in Drywell Equipment Drain Leakage (LR/FR-16103)	3600%	4400%

E. The 24 hour previous average inleakage for Sump A was 0.03 gpm.

F. The 24 hour previous average inleakage for Sump B was 0.03 gpm.

V. INITIATING CUE

Determine RCS leakage by completing Item 18 of SO-100-006, SHIFTLY SURVEILLANCE OPERATING LOG, Attachment A and determine if any Tech Spec limits are being exceeded. Record the results of the calculation and determination.

Additional SRO Only Cue (if determines Tech Spec limit(s) exceeded):

Determine the Technical Specification required actions based on your findings.

VI. TASK STANDARD

Unidentified RCS leakage is determined to be 0.31 gpm. A determination is made that RCS leakage is within the Tech Spec allowable value of ≤ 5 gpm. Total unidentified delta leakage is determined to be 0.25 gpm/24 hours. A determination is made that delta leakage is within the Tech Spec allowable value of < 2 gpm/4 hours. Total leakrate is determined to be 26.18 gpm. A determination is made that delta leakage is above the Tech Spec allowable value of ≤ 25 gpm. SROs additionally determine the Tech Spec required action for high total leakage.

VII. TASK SAFETY SIGNIFICANCE

Calculation of Drywell leakage is important to ensure compliance with Technical Specifications and monitor RCS boundary integrity.

Appl. To/JPM No.: 00.AD.037.051 Student Name:________________________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE: To begin this JPM, provide the candidate with the Task Conditions and Initiating Cue Sheet, plus SO-100-106 Attachments F and L filled out for the previous 2100 hour surveillance (see Student Handout). See red ink on provided key for expected candidate entries corresponding to the values within the JPM. See green ink on provided key for allowable tolerance on calculated values.			
1.	Obtain a controlled copy of SO-100-006, SHIFTLY SURVEILLANCE OPERATING LOG.	Controlled copy obtained from evaluator.		
2.	Selects the correct section to perform.	Selects item A18.		
3.	Determines Attachment F and L will need to be completed.	Determines Attachment F and L will need to be completed.		
	EVALUATOR NOTE: The candidate may refer to Attachments E and M for the instructions on how to complete Attachments F and L. This JPM is written to follow this guidance. The candidate does not need to use Attachments E and M to complete the JPM, rather the candidate need only correctly complete Attachments F and L to successfully complete this JPM.			

Appl. To/JPM No.: 00.AD.037.051 Student Name:________________________

Step	Action	Standard	Eval	Comments
4.	Refers to Attachments E and M for instructions on completing Attachments F and L.	Locates Attachments E and M.		
5.	Determine total number of level increases from the last 12 hour period on DRWL SUMPS FLOW & LVL LR/FR-16103 (Point 1) (Alternate: Computer Pt. RLL004Z) including increase that occurs coincident with start of each pumpdown (indicated by a sharp drop in level; level spike may not be evident). **EVALUATOR NOTE** Candidate may ask if there were any level increases coincident with the shutdown of the pump. If so, tell them NO.	Places 6 in the space provided on SO-100-006 Attachment F. (item b)		
6.	Determine total number of level increases for the last 12 hour period on DRWL SUMPS FLOW & LVL RECORDER LR/FR-16103 (Alternate: Computer Pt. RLL005Z) (Point 2) including increase that occurs coincident with start of each pumpdown (indicated by a sharp drop in level; level spike may not be evident).	Places 5 in the space provided on SO-100-006 Attachment F. (item c)		
7.	Compute total gallons accumulated for DRWL Sump A. (Total Level Increases) (19 gal/level) = total gallons.	Places 114 in the space provided on SO-100-006 Attachment F. (item d) (6 X 19 = 114)		

✱Critical Step #Critical Sequence

Appl. To/JPM No.: 00.AD.037.051 Student Name:____________________

Step	Action	Standard	Eval	Comments
8.	Compute total gallons accumulated for DRWL Sump B. (Total Level Increases) (21 gal/level) = total gallons.	Places 105 in the space provided on SO-100-006 Attachment F. (item e) (5 X 21 = 105)		
9.	Determine average Inleakage for DRWL Sump A (total gallons)/(elapsed time in minutes) = average inleakage. **EVALUATOR NOTE:** 0.03 in item h was provided as a carry-over item from the previous day in the initial conditions.	Places 0.16 in the space provided on SO-100-006 Attachment F. (item g) (114/720=0.16) (±0.02)		
10.	Determine the change in inleakage from the last time the inleakage was determined. (current inleakage) - (previous inleakage) = change in inleakage.	Places 0.13 in the space provided on SO-100-006 Attachment F. (item i) (0.16 – 0.03=0.13) (±0.02)		
11.	Determine average inleakage for DRWL Sump B (total gallons)/(elapsed time in minutes) = average inleakage. **EVALUATOR NOTE:** 0.03 in item k was provided as a carry-over item from the previous day in the initial conditions.	Places 0.15 in the space provided on SO-100-006 Attachment F. (item j) (105/720=0.15) (±0.02)		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.AD.037.051 Student Name:____________________

Step	Action	Standard	Eval	Comments
12.	Determine change in inleakage from the last time the inleakage was determined. (current inleakage) - (previous inleakage) = change in inleakage.	Places 0.12 in the space provided on SO-100-006 Attachment F. (item l) (0.15-0.03=0.12) (±0.02)		
∗13.	Determine the total average inleakage (inleakage Sump A) + (inleakage Sump B). < 5 gpm required. **EVALUATOR NOTE** The candidate may reference a procedure note which states, "Greater than or equal to 0.2 gpm is an entry condition into ON-100-005."	Places 0.31 in the space provided on SO-100-006 Attachment F. (item m) (0.16 + 0.15 = 0.31) (±0.04)		
∗14.	Determine the total change in inleakage from the last time the inleakage was determined (delta inleakage Sump A) + (delta inleakage Sump B). < 2 gpm/24 hours required. **EVALUATOR NOTE** The candidate may reference a procedure note which states, "A greater than or equal to 0.1 gpm rise in last 24 hours is an entry condition into ON-100-005."	Places 0.25 in the space provided on SO-100-006 Attachment F. (item n) (0.13 + 0.12 = 0.25) (±0.04)		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.AD.037.051 Student Name:____________________

Step	Action	Standard	Eval	Comments
15.	After 0900 average inleakage calculation, Enter average inleakage recorded for both 2100 and 0900 in steps g. and j. to next day's worksheet to be used as 24 hour previous values in steps h. and k. for 2100 and 0900, respectively. **EVALUATOR CUE:** If necessary, inform the candidate that it is not required to perform the transposition to tomorrow's surveillance JPM.	N/A		
16.	Compute total gallons accumulated for DRWL Sump A. (Add total from each 12 hour period from Attachment F)	Places 152 in the space provided on SO-100-006 Attachment L. (item 1a) (38 + 114 = 152)		
17.	Compute total gallons accumulated for DRWL Sump B. (Add total from each 12 hour period from Attachment F)	Places 147 in the space provided on SO-100-006 Attachment L. (item 1b) (42 + 105 = 147)		
18.	Determine average inleakage for DRWL Sump A. (total gallons)/(elapsed time in minutes) = average inleakage	Places 0.11 in the space provided on SO-100-006 Attachment L. (item 1d) (152/1440=0.11) (±0.02)		
19.	Determine average inleakage for DRWL Sump B. (total gallons)/(elapsed time in minutes) = average inleakage	Places 0.10 in the space provided on SO-100-006 Attachment L. (item 1e) (147/1440=0.10) (±0.02)		

✱Critical Step #Critical Sequence

Appl. To/JPM No.: 00.AD.037.051 Student Name:_______________

Step	Action	Standard	Eval	Comments
20.	Determine total percent from last 24 hr time mark on DRWL EQUIP DRN TANK LR/FR-16103 (Alternate: Computer Pt. RLL006Z).	Places 4400 in the space provided on SO-100-006 Attachment L. (item 2a)		
21.	Compute total gallons accumulated on LEVEL RECORDER LR/FR-16103 (Alternate: Computer Pt. RLL006Z). (Total %) (8.5 gal/%) = total gallons Example: (380%) (8.5 gal) = 3230 gallons	Places 37400 in the space provided on SO-100-006 Attachment L. (item 2b) (4400 X 8.5 = 37400)		
22.	Determine average inleakage recorded on LEVEL RECORDER LR/FR-16103 (Alternate: Computer Pt. RLL006Z) (total gallons)/(elapsed time in minutes) = average inleakage.	Places 25.97 in the space provided on SO-100-006 Attachment L. (item 2d) (37400/1440=25.97) (25.9-26.0 acceptable)		
23.	Compute TOTAL DRYWELL LEAKAGE Record average leakrate from step 1.d.	Places 0.11 in the space provided on SO-100-006 Attachment L. (item 3a) (±0.02)		
24.	Record average leakrate from step 1.e.	Places 0.10 in the space provided on SO-100-006 Attachment L. (item 3b) (±0.02)		
25.	Record average leakrate from step 2.d.	Places 25.97 in the space provided on SO-100-006 Attachment L. (item 3c) (25.9-26.0 acceptable)		

✳Critical Step #Critical Sequence

Appl. To/JPM No.: 00.AD.037.051 Student Name:_______________

Step	Action	Standard	Eval	Comments
✱26.	Sum total leakrate (a+b+c) required <25 gpm. **EVALUATOR CUE:** If necessary, remind candidate that they were asked to report the results to the supervisor.	Places 26.18 in the space provided on SO-100-006 Attachment L. (item 3d) (0.11 + 0.10 + 25.97 = 26.18) (26.07-26.25 acceptable)		
27.	Compares calculated values to the ACCEPTABLE values listed in SO-100-006 SHIFTLY SURVEILLANCE OPERATING LOG.	Compares calculated values to the ACCEPTABLE values listed in SO-100-006 SHIFTLY SURVEILLANCE OPERATING LOG. AND Determines that the total leakrate calculated in step 3.d of attachment L is GREATER Than Tech Spec allowable value of ≤ 25 gpm.		
✱28.	Report the results of the calculation and determination. **EVALUATOR CUE:** Role-play Control room supervisor and acknowledge the report.	Reports total leakrate is greater than the ≤ 25 gpm limit.		

✱Critical Step #Critical Sequence

Step	Action	Standard	Eval	Comments
	EVALUATOR CUE (for ROs) This completes the JPM. **EVALUATOR CUE (for SROs)** Give the SRO candidate the second cue sheet that addresses the Tech Spec LCO for RCS Leakage.			
29.	Obtains a copy of the Tech Specs	References Tech Spec 3.4.4		
✱30.	Determines required actions **EVALUATOR NOTE** A typo has been identified in Unit 1 TS 3.4.4. A change has been initiated, but may not be completed in time for the examination. TS 3.4.4 erroneously states Required Action C.2 is to be in MODE 4 in 35 hours, vice 36 hours. If the candidate states the requirement is within 35 hours, this is both conservative and in accordance with the exact wording of the TS, and is deemed to meet this critical step. **EVALUATOR CUE** If the candidate does not reference Required Actions C.1 and C.2, it may be necessary to ask the candidate what additional actions would be required IF the total leakage cannot be reduced ≤ 25 gpm within 4 hours.	Determines the following actions will be required as per T.S. 3.4.4 Condition A: Required Action A.1: Restore leakage to ≤ 25 gpm within 4 hours Required Action C.1 and C.2: If leakage cannot be reduced to ≤ 25 gpm within 4 hours then: Be in MODE 3 within 12 hours AND Be in MODE 4 within 36 hours		

✱Critical Step #Critical Sequence

Appl. To/JPM No.: 00.AD.037.051 Student Name:________________________

Step	Action	Standard	Eval	Comments
	EVALUATOR CUE: This completes the JPM.			

DRYWELL FLOOR DRAIN INLEAKAGE CALCULATION WORKSHEET (1)
(ADHERENCE LEVEL - CONTINUOUS USE)

☐

NOTE:	Normal level changes from pump down to pump down are 4 steps per cycle. Any unexplained anomaly from this normal level change will require an AR written to evaluate the anomaly.

NOTE: Circle Alternate if used.

a.	Time	2100	0900
b.	Total number of times Level rises LR/FR-16103 Sump A (Alternate: Computer Pt. RLL004Z)	2	**6**
c.	Total number of times Level rises LR/FR-16103 Sump B (Alternate: Computer Pt. RLL005Z)	2	**5**
d.	Total Gallons DRWL SUMP A (Total Levels) x (19 gal/level)	38 gal	**114** gal
e.	Total Gallons DRWL SUMP B (Total levels) x (21 gal/level)	42 gal	**105** gal
f.	Total elapsed time	720 min	720 min
g.	Average inleakage DRWL SUMP A (total gal)/(elapsed time) (d/f)	0.05 gpm	**0.16** gpm (±0.02)
h.	Average inleakage from previous day (24 hours previous) for DRWL SUMP A	0.03 gpm	0.03 gpm
i.	Delta inleakage DRWL SUMP A (g-h)	0.02 gpm	**0.13** gpm (±0.02)
j.	Average inleakage DRWL SUMP B (total gal)/(elapsed time) (e/f)	0.06 gpm	**0.15** gpm (±0.02)
k.	Average inleakage from previous day (24 hours previous) for DRWL SUMP B	0.03 gpm	0.03 gpm
l.	Delta inleakage for DRWL SUMP B (j-k)	0.03 gpm	**0.12** gpm (±0.02)
m.	Total average inleakage (g+j) < 5 gpm required	0.11 gpm*	**0.31** gpm* (±0.04)
n.	Total delta inleakage (i+l) < 2 gpm/24 hours required	0.05 gpm**	**0.25** gpm** (±0.04)

* Greater than or equal to 0.2 gpm is an entry condition into ON-100-005.
** A greater than or equal to 0.1 gpm rise in last 24 hours is an entry condition into ON-100-005.

EVALUATOR'S KEY

DRYWELL LEAKAGE CALCULATION WORKSHEET

(ADHERENCE LEVEL - CONTINUOUS USE)

1. DRYWELL FLOOR DRAIN LEAKAGE (Unidentified Leakage)

☐ NOTE: Leakage is calculated for the previous 24 hour period.

		2100 to 2100		0900 to 0900	
a.	Total gallons DRWL Sump A (From Attachment F)	57	gal	**152**	gal
b.	Total gallons DRWL Sump B (From Attachment F)	42	gal	**147**	gal
c.	Total elapsed time for 24 hr period	1440	min	1440	min
d.	Average inleakage DRWL Sump A (Total gallons)/(elapsed time)	0.04	gpm	**0.11** (±0.02)	gpm
e.	Average inleakage DRWL Sump B (Total gallons)/(elapsed time)	0.03	gpm	**0.10** (±0.02)	gpm

2. DRYWELL EQUIPMENT DRAIN LEAKAGE (Identified Leakage)

☐ NOTE: **Circle** Alternate if used.

a.	Total percent (Primary: LR/FR-16103) (Alternate: Computer Pt. RLL006Z)	3600	%	**4400**	%
b.	Total gallons (Total percent) (8.5 gal/%)	30600	gal	**37400**	gal
c.	Total elapsed time for 24 hr period	1440	min	**1440**	min
d.	Average inleakage (Total gallons)/(elapsed time)	21.25	gpm	**25.97** (25.9-26.0)	gpm

3. TOTAL DRYWELL LEAKAGE

a.	Drywell Floor Drain (Step 1.d) (Unidentified)	0.04	gpm	**0.11** (±0.02)	gpm
b.	Drywell Floor Drain (Step 1.e) (Unidentified)	0.03	gpm	**0.10** (±0.02)	gpm
c.	Drywell Equipment Drain (Step 2.d) (Identified)	21.25	gpm	**25.97** (25.9-26.0)	gpm
d.	Total leakrate (a+b+c) required ≤ 25 gpm	21.32	gpm	**26.18** (26.07-26.25)	gpm

EVALUATOR'S KEY

TASK CONDITIONS

A. Unit 1 is operating at 100% power.

B. Sometime during the past 24 hours, Drywell sump in-leakage began rising.

C. It is 0900 hours and time to perform SO-100-006, SHIFTLY SURVEILLANCE OPERATING LOGS.

D. The following table shows the data used in the last RCS leakage calculations (2100) and the current data (0900):

Parameter	2100	0900
Total number of times Level rises LR/FR-16103 Sump A	2	6
Total number of times Level rises LR/FR-16103 Sump B	2	5
Total percent rise in Drywell Equipment Drain Leakage (LR/FR-16103)	3600%	4400%

E. The 24 hour previous average inleakage for Sump A was 0.03 gpm.

F. The 24 hour previous average inleakage for Sump B was 0.03 gpm.

INITIATING CUE

Determine RCS leakage by completing Item 18 of SO-100-006, SHIFTLY SURVEILLANCE OPERATING LOG, Attachment A and determine if any Tech Spec limits are being exceeded. Record the results of the calculation and determination.

TASK CONDITIONS

A. Unit 1 is operating at 100% power.

B. Sometime during the past 24 hours, Drywell sump in-leakage began rising.

C. It is 0900 hours and time to perform SO-100-006, SHIFTLY SURVEILLANCE OPERATING LOGS.

D. The following table shows the data used in the last RCS leakage calculations (2100) and the current data (0900):

Parameter	2100	0900
Total number of times Level rises LR/FR-16103 Sump A	2	6
Total number of times Level rises LR/FR-16103 Sump B	2	5
Total percent rise in Drywell Equipment Drain Leakage (LR/FR-16103)	3600%	4400%

E. The 24 hour previous average inleakage for Sump A was 0.03 gpm.

F. The 24 hour previous average inleakage for Sump B was 0.03 gpm.

INITIATING CUE

Determine RCS leakage by completing Item 18 of SO-100-006, SHIFTLY SURVEILLANCE OPERATING LOG, Attachment A and determine if any Tech Spec limits are being exceeded. Record the results of the calculation and determination.

DRYWELL FLOOR DRAIN INLEAKAGE CALCULATION WORKSHEET (1)
(ADHERENCE LEVEL - CONTINUOUS USE)

☐

NOTE:	Normal level changes from pump down to pump down are 4 steps per cycle. Any unexplained anomaly from this normal level change will require an AR written to evaluate the anomaly.

NOTE: Circle Alternate if used.

a.	Time	2100	0900
b.	Total number of times Level rises LR/FR-16103 Sump A (Alternate: Computer Pt. RLL004Z)	2	____
c.	Total number of times Level rises LR/FR-16103 Sump B (Alternate: Computer Pt. RLL005Z)	2	____
d.	Total Gallons DRWL SUMP A (Total Levels) x (19 gal/level)	38 gal	____ gal
e.	Total Gallons DRWL SUMP B (Total levels) x (21 gal/level)	42 gal	____ gal
f.	Total elapsed time	720 min	720 min
g.	Average inleakage DRWL SUMP A (total gal)/(elapsed time) (d/f)	0.05 gpm	____ gpm
h.	Average inleakage from previous day (24 hours previous) for DRWL SUMP A	0.03 gpm	0.03 gpm
i.	Delta inleakage DRWL SUMP A (g-h)	0.02 gpm	____ gpm
j.	Average inleakage DRWL SUMP B (total gal)/(elapsed time) (e/f)	0.06 gpm	____ gpm
k.	Average inleakage from previous day (24 hours previous) for DRWL SUMP B	0.03 gpm	0.03 gpm
l.	Delta inleakage for DRWL SUMP B (j-k)	0.03 gpm	____ gpm
m.	Total average inleakage (g+j) < 5 gpm required	0.11 gpm*	____ gpm*
n.	Total delta inleakage (i+l) < 2 gpm/24 hours required	0.05 gpm**	____ gpm**

* Greater than or equal to 0.2 gpm is an entry condition into ON-100-005.
** A greater than or equal to 0.1 gpm rise in last 24 hours is an entry condition into ON-100-005.

DRYWELL LEAKAGE CALCULATION WORKSHEET

(ADHERENCE LEVEL - CONTINUOUS USE)

1. DRYWELL FLOOR DRAIN LEAKAGE (Unidentified Leakage)

> NOTE: Leakage is calculated for the previous 24 hour period.

		2100 to 2100		0900 to 0900	
a.	Total gallons DRWL Sump A (From Attachment F)	57	gal		gal
b.	Total gallons DRWL Sump B (From Attachment F)	42	gal		gal
c.	Total elapsed time for 24 hr period	1440	min	1440	min
d.	Average inleakage DRWL Sump A (Total gallons)/(elapsed time)	0.04	gpm		gpm
e.	Average inleakage DRWL Sump B (Total gallons)/(elapsed time)	0.03	gpm		gpm

2. DRYWELL EQUIPMENT DRAIN LEAKAGE (Identified Leakage)

> NOTE: **Circle** Alternate if used.

a.	Total percent (Primary: LR/FR-16103) (Alternate: Computer Pt. RLL006Z)	3600	%		%
b.	Total gallons (Total percent) (8.5 gal/%)	30600	gal		gal
c.	Total elapsed time for 24 hr period	1440	min	1440	min
d.	Average inleakage (Total gallons)/(elapsed time)	21.25	gpm		gpm

3. TOTAL DRYWELL LEAKAGE

a.	Drywell Floor Drain (Step 1.d) (Unidentified)	0.04	gpm		gpm
b.	Drywell Floor Drain (Step 1.e) (Unidentified)	0.03	gpm		gpm
c.	Drywell Equipment Drain (Step 2.d) (Identified)	21.25	gpm		gpm
d.	Total leakrate (a+b+c) required $\leq$ 25 gpm	21.32	gpm		gpm

Additional SRO Only Cue

Determine the Technical Specification required actions based on your findings.

Additional SRO Only Cue

Determine the Technical Specification required actions based on your findings.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Evaluate Overtime Request With Respect to Work Hour Limits per NDAP-QA-0025

S/RO	00.AD.3246.202	0	03/25/2013	Classroom
Appl To	JPM Number	Revision	Date	Setting

G	2.1.5	2.9/3.9	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/25/2013	25/30
Author	Date	Validation Time (min)

Validated / Approval

RC/ TS	3/28/2013	Cory B Duff	4/9/2013
Operations Instructor	Date	Nuclear Trng Supv	Date

Examinee Name: ______________________ Last, First MI ______________ Employee Number

Exam Date: ______________ Exam Duration (Min) ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________

Name Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 00.AD.3246.202

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. NDAP-QA-0025, WORKING HOUR LIMITS FOR STATION STAFF, REV 12

B. 10CFR26.205, WORK HOURS

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

1. Unit 2 is shutdown for a refueling outage.
2. Current time is 1830 on May 30, 2013.
3. This is day #29 of the outage.
4. An Operator scheduled to work the day shift on May 31, 2013 at Unit 2 has called in sick for that shift.
5. In order to support minimum control room staffing requirements, personnel overtime will be required for the day shift on May 31, 2013 from 0630-1830.
6. All the overtime hours will be spent performing control room activities on Unit 2.
7. Working hours are provided for five Reactor Operators. All of these hours were spent working under outage work hour controls at Unit 2.
8. May 17, 2013 through May 31, 2013 is a fixed 15-day period for work hour rule considerations.

V. INITIATING CUE

From the provided list of personnel working hours (all working under outage work hour controls), determine who is eligible to work a complete 12 hour shift beginning at 0630 on May 31 without exceeding the limits of NDAP-QA-0025.

If a Work Hour Limits Waiver would be required for any individual(s), state the work hour limit(s) which would be exceeded IAW NDAP-QA-0025.

Additional SRO Only Cue (to be provided later):

1. ROs #1, #3, #4, and #5 have not been able to be contacted.

2. RO #2 is the only operator available and will be required to work.

Determine the required actions to allow RO #2 to cover this shift on May 31. Document your findings in the space below.

VI. TASK STANDARD

Determine personnel availability for overtime IAW NDAP-QA-0025.

VII. TASK SAFETY SIGNIFICANCE

Managing of fatigue through compliance with work hour limitations is important to ensure control room operators are fit-for-duty.

Appl. To/JPM No.: 00.AD.3246.202 Student Name:_______________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE: To begin this JPM, provide the candidate with the Task Conditions and Initiating Cue Sheet, the Work History handout, the blank Answer Sheet and a copy of NDAP-QA-0025.			
1.	Obtain a controlled copy of NDAP-QA-0025.	Controlled copy obtained from evaluator.		
∗2.	Reviews work hours for Reactor Operator #1.	Determines Reactor Operator #1 is eligible to work.		
∗3.	Reviews work hours for Reactor Operator #2.	Determines Reactor Operator #2 is NOT eligible to work. Determines Reactor Operator #2 would work more than 72 hours in a 7 day period.		
∗4.	Reviews work hours for Reactor Operator #3.	Determines Reactor Operator #3 is NOT eligible to work. Determines Reactor Operator #3 would NOT have at least a 34 hour break in last 9 days (5/23-5/31).		
∗5.	Reviews work hours for Reactor Operator #4.	Determines Reactor Operator #4 is eligible to work.		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.AD.3246.202 Student Name:________________________

Step	Action	Standard	Eval	Comments
✱6.	Reviews work hours for Reactor Operator #5. **EVALUATOR CUE (for ROs):** This completes the JPM. **EVALUATOR CUE (for SROs):** Give the SRO candidate the second cue sheet that addresses processing of a waiver and a blank NDAP-QA-0025 Attachment B.	Determines Reactor Operator #5 is NOT eligible to work. Determines Reactor Operator #5 would work more than 26 hours in a 48 hour period.		
✱7.	SRO Only – Determines required actions to allow RO #2 to work. **EVALUATOR CUE:** This completes the JPM.	Determines NDAP-QA-0025 requires the following actions to allow RO #2 to work: • A face to face Fatigue Assessment of the individual must be performed. • A Waiver Request must be completed.		

✱Critical Step #Critical Sequence

Evaluator's Answer Key

	Eligible to work without a Work Hour Limits Waiver? (Yes/No)	If No, what work hour limit(s) would be exceeded IAW NDAP-QA-0025?
RO #1	Yes	N/A
RO #2	No	Would work more than 72 hours in last 7 days (5/25-5/31)
RO #3	No	Would not have at least a 34 hour break in last 9 days (5/23-5/31)
RO #4	Yes	N/A
RO #5	No	Would work more than 26 hours in last 48 hours

TASK CONDITIONS

1. Unit 2 is shutdown for a refueling outage.
2. Current time is 1830 on May 30, 2013.
3. This is day #29 of the outage.
4. An Operator scheduled to work the day shift on May 31, 2013 at Unit 2 has called in sick for that shift.
5. In order to support minimum control room staffing requirements, personnel overtime will be required for the day shift on May 31, 2013 from 0630-1830.
6. All the overtime hours will be spent performing control room activities on Unit 2.
7. Working hours are provided for five Reactor Operators. All of these hours were spent working under outage work hour controls at Unit 2.
8. May 17, 2013 through May 31, 2013 is a fixed 15-day period for work hour rule considerations.

INITIATING CUE

From the provided list of personnel working hours, determine who is eligible to work a complete 12 hour shift beginning at 0630 on May 31 without exceeding the limits of NDAP-QA-0025.

If a Work Hour Limits Waiver would be required for any individual(s), state the work hour limit(s) which would be exceeded IAW NDAP-QA-0025.

TASK CONDITIONS

1. Unit 2 is shutdown for a refueling outage.
2. Current time is 1830 on May 30, 2013.
3. This is day #29 of the outage.
4. An Operator scheduled to work the day shift on May 31, 2013 at Unit 2 has called in sick for that shift.
5. In order to support minimum control room staffing requirements, personnel overtime will be required for the day shift on May 31, 2013 from 0630-1830.
6. All the overtime hours will be spent performing control room activities on Unit 2.
7. Working hours are provided for five Reactor Operators. All of these hours were spent working under outage work hour controls at Unit 2.
8. May 17, 2013 through May 31, 2013 is a fixed 15-day period for work hour rule considerations.

INITIATING CUE

From the provided list of personnel working hours, determine who is eligible to work a complete 12 hour shift beginning at 0630 on May 31 without exceeding the limits of NDAP-QA-0025.

If a Work Hour Limits Waiver would be required for any individual(s), state the work hour limit(s) which would be exceeded IAW NDAP-QA-0025.

Answer Sheet

	Eligible to work without a Work Hour Limits Waiver? (Yes/No)	If No, what work hour limit(s) would be exceeded IAW NDAP-QA-0025?
RO #1		
RO #2		
RO #3		
RO #4		
RO #5		

Work History

RO #1																		
5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28	5/29	5/30	5/31
OFF	0630 - 1830	0630 - 1830	OFF	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	OFF	OFF	0630 - 1830	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	?

RO #2																		
5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28	5/29	5/30	5/31
OFF	0630 - 1830	0630 - 1830	OFF	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	OFF	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	?

RO #3																		
5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28	5/29	5/30	5/31
0630 - 1830	0630 - 1830	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	OFF	OFF	OFF	0630 - 1430	0630 - 1430	0630 - 1430	0630 - 1430	0630 - 1430	0630 - 1430	0630 - 1430	0630 - 1430	?

Work History

RO #4																		
5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28	5/29	5/30	5/31
OFF	0630 - 1830	0630 - 1830	OFF	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	OFF	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	?

RO #5																		
5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28	5/29	5/30	5/31
OFF	0630 - 1430	0630 - 1430	0630 - 1430	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1430	OFF	0630 - 1430	0630 - 1430	0630 - 1430	0630 - 1430	0630 - 1430	OFF	0530 - 2030	?

Additional SRO Only Cue

1. ROs #1, #3, #4, and #5 have not been able to be contacted.
2. RO #2 is the only operator available and will be required to work.

Determine the required actions to allow RO #2 to cover this shift on May 31. Document your findings in the space below.

Additional SRO Only Cue

1. ROs #1, #3, #4, and #5 have not been able to be contacted.
2. RO #2 is the only operator available and will be required to work.

Determine the required actions to allow RO #2 to cover this shift on May 31. Document your findings in the space below.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title Perform LPRM Upscale Alarm Operability Tracking and Determine Required Actions

S/RO	78.AD.2319.102	2	03/25/2013	Classroom
Appl To	JPM Number	Revision	Date	Setting

G	2.2.14	3.9/4.3	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/25/2013	25
Author	Date	Validation Time (min)

Validated / Approval

RC Th	3/28/2013	Corey B Goff	4/9/2013
Operations Instructor	Date	Nuclear Trng Supv	Date

Examinee Name: ______________________ ______________________

Last, First MI — Employee Number

Exam Date: ____________ Exam Duration (Min) ____________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________

Name — Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 78.AD.2319.102

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OI-078-001, LPRM STATUS CONTROL (REV 11)

B. SO-100-008, WEEKLY SURVEILLANCE OPERATING LOG

C. Technical Specification 3.3.1.1

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. Unit 1 is in MODE 1 at 80% power.
B. APRM 2 is INOP and bypassed.
C. APRM Gain Calibration was last performed 5 days ago.
D. LPRM detector 40-57A caused a downscale alarm, I & C determined the detector failed, and Reactor Engineering requested bypassing the detector.
E. The PCOP has just bypassed LPRM detector 40-57A in the lower relay room.

V. INITIATING CUE

Perform LPRM Upscale Alarm operability tracking for LPRM detector 40-57A in accordance with OI-078-001.

VI. TASK STANDARD

For RO and SRO:

- Zone 8 is identified as having LESS THAN 50% upscale alarms operable.
- APRM Channel 1 determined to be INOPERABLE based on < 3 operable LPRM inputs to the "A" Level.

For SROs only:

- Determine that LCO 3.3.3.1 IS NOT MET for APRM required channels, and TS action A.1 is required; place channel in trip within 12 hours.

- Determine that TRO 3.1.3 is NOT MET for APRM rod block functions, and TRM actions B.2 is required; place at least 1 inop channel in trip condition 7 days.

VII. TASK SAFETY SIGNIFICANCE

Operability of the APRM system and associated LPRM detectors provides the primary indication of neutron flux within the core and the resulting Reactor Protection System inputs.

Appl. To/JPM No.: 78.AD.2319.102 Student Name:________________________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE Ensure the following material is available to support performance of this JPM: • A working copy of OI-078-001. **CAUTION: Ensure the answer key is NOT given to the student.** • Previously filled out Attachments A - D (with zone 8 having exactly 50% operable LPRM upscale alarms). • Blank copy of attachments A - D. • A copy of SO-100-008. • A copy of Technical Specifications **EVALUATOR CUE:** To begin this JPM, provide the candidate with: • Task Conditions and Initiating Cue Sheet • Working copy of OI-078-001, and blank attachments A - D • Previously filled out attachments A - D			
1.	Obtain a controlled copy of the procedure.	Controlled copy obtained from evaluator.		
2.	Selects the correct section to perform.	Selects section 4.		

✱Critical Step #Critical Sequence

Appl. To/JPM No.: 78.AD.2319.102 Student Name:____________________

Step	Action	Standard	Eval	Comments
3.	Determine current LPRM status.	Refers to the previously completed copy of Attachments A & B.		
4.	Complete new Attachment A.	Enters 1 for Unit. Transfers the previous LPRM data to the new Attachment A.		
5.	Enter a check (√) in column (2) for LPRM alarms determined inoperable or bypassed for all other reasons.	Places a checkmark in column 2 adjacent to LPRM detector 40-57A in Zone 8.		
✱6.	Consider all LPRM Upscale Alarms with a check in column (1) or (2) of Attachment A as inoperable. Determine if ≥50% of LPRM Upscale alarms in each zone are operable and circle YES or NO as applicable.	Circles YES for zone 1, 2, 3, 4, 5, 6, 7, and 9. Determines that there are LESS THAN 50% operable LPRMs in zone 8, AND circles NO for zone 8.		
7.	Notify Reactor Engineering of all LPRM upscale alarms determined inoperable.	N/A Previously stated in JPM task conditions.		
8.	Evaluate the need to place placard to 1C651 indicating < required # of LPRM Upscale Alarms. (requires completion of Attachments C & D, which appears in Step 11, below.)	Determines that placard is NOT required.		

✱Critical Step #Critical Sequence

Appl. To/JPM No.: 78.AD.2319.102 Student Name:________________________

Step	Action	Standard	Eval	Comments
✱9.	Complete an LPRM vs. APRM Status Control Log (Attachment B) each time LPRM operability status is changed. Circle all inoperable LPRMs on LPRM vs. APRM Status Control Log (Attachment B).	Transfer the previous LPRM data to the new Attachment B. Circle LPRM detector 40-57A for APRM 1, under the column 'A' Level, and enter today's date.		
✱10.	Refer to weekly surveillance SO-100-008 to confirm APRM operability requirements maintained.	Compare the following criteria to current APRM/LPRM operability status: • ≥ 20 total operable LPRMs per APRM channel • ≥ 3 LPRM inputs per level (A, B, C, or D) • ≤ 9 LPRMs inop since last APRM gain calibration (after date provided in task conditions) Determine that APRM channel 1 does NOT meet operability requirements due to LESS THAN 3 operable level "A" LPRMs. (The only operable Level A LPRMs in APRM 1 are 40-17A and 08-49A)		

✱Critical Step #Critical Sequence

Appl. To/JPM No.: 78.AD.2319.102 Student Name:_______________________

Step	Action	Standard	Eval	Comments
11.	Track operability of OPRM cells. **EVALUATOR CUE (for ROs)** This completes the JPM. **EVALUATOR CUE (for SROs)** Give the SRO candidate the second cue sheet that addresses determining required actions.	Transfers the previous LPRM data to the new Attachment C and circles "A LEVEL" for LPRM 40-57. Determines it inputs to APRM1 Cell 03. Transfers the previous LPRM data to the new Attachment D and circles LPRM 40-57A in the Cell 03 row, in the LPRM#2 column. Determines OPRM cell remains operable due to at least two operable LPRMs.		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 78.AD.2319.102 Student Name:________________________

Step	Action	Standard	Eval	Comments
∗12.	Evaluate Tech Spec 3.3.1.1 for RPS Instrumentation and TR 3.1.3 for Control Rod Block Instrumentation. **EVALUATOR CUE** This completes the JPM.	Refer to Tech Spec 3.3.1.1 and determine that a minimum of 3 operable APRM channels are required in MODE 1 per table 3.3.1.1-1, therefore action A.1 is required; place channel in trip within 12 hours. **(CRITICAL)** Refer to TRM 3.1.3 and determine that a minimum of 3 operable APRM channels are required in MODE 1 per table 3.1.3-1, therefore action B.2 is required; place 1 channel in tripped condition within 7 days. **(NOT CRITICAL)** Refer to TRM 3.3.9 and determine that a placard must be posted at 1C651 indicating less than required number of LPRM upscale alarms. **(NOT CRITICAL)**		

∗Critical Step #Critical Sequence

Black = handout
Red = orange

LPRM UPSCALE ALARM STATUS CONTROL LOG

UNIT 1

	LPRM	(1)	(2)	LPRM	(1)	(2)	LPRM	(1)	(2)	LPRM	(1)	(2)	LPRM	(1)	(2)	As least 50% LPRMs Operable per Zone (Circle YES or NO)
Zone 1	16-49A			16-41A			24-49A			24-41A		✓				
	16-49B	✓		16-41B			24-49B			24-41B						YES/NO
	16-49C			16-41C	✓		24-49C	✓		24-41C						
Zone 2	40-49A	✓		40-41A	✓		48-49A			48-41A						
	40-49B			40-41B			48-49B	✓		48-41B	✓					YES/NO
	40-49C	✓		40-41C	✓		48-49C			48-41C						
Zone 3	16-17A			16-25A			24-17A			24-25A						
	16-17B			16-25B			24-17B			24-25B						YES/NO
	16-17C			16-25C		✓	24-17C			24-25C						
Zone 4	40-17A			40-25A		✓	48-17A			48-25A						
	40-17B			40-25B			48-17B			48-25B						YES/NO
	40-17C			40-25C			48-17C			48-25C	✓					
Zone 5	24-33A		✓	32-25A			32-33A			32-41A			40-33A			
	24-33B		✓	32-25B			32-33B			32-41B		✓	40-33B			YES/NO
	24-33C		✓	32-25C			32-33C			32-41C			40-33C			
Zone 6	16-09A			24-09A	✓		32-09A			40-09A			32-17A			
	16-09B			24-09B			32-09B		✓	40-09B			32-17B			YES/NO
	16-09C			24-09C	✓		32-09C			40-09C		✓	32-17C			
Zone 7	08-17A	✓		08-25A	✓		08-33A			08-41A			16-33A			
	08-17B			08-25B			08-33B			08-41B			16-33B			YES/NO
	08-17C			08-25C			08-33C	✓		08-41C			16-33C			
Zone 8	24-57A			32-57A			40-57A		✓	32-49A		✓				
	24-57B			32-57B		✓	40-57B		✓	32-49B		✓				YES/NO
	24-57C	✓		32-57C			40-57C			32-49C		✓				
Zone 9	48-33A			56-25A			56-33A		✓	56-41A		✓				
	48-33B			56-25B			56-33B			56-41B						YES/NO
	48-33C			56-25C			56-33C		✓	56-41C						

LPRM Upscale Alarm Status Assessment Complete

(Sign) J Smith
Shift Supervision

(Date) / previous Monday /
Date

(Time) 0115
Time

LPRM vs. APRM Status Control Log
(Inoperable LPRM's are circled)

UNIT 1 or 2 (Circle Unit)	LPRM LOCATIONS							
APRM CHANNEL	A LEVEL	Date inop.	B LEVEL	Date inop.	C LEVEL	Date inop	D LEVEL	Date inop.
APRM1	56-33A	4/5/12	32-09B	6/15/12	08-33C	11/2/12	32-57D	
	40-49A	6/10/12	16-25B		40-33C		16-41D	3/5/12
	40-17A		16-57B		24-17C		48-09D	
	24-33A	7/8/12	48-25B		24-49C	3/10/12	32-25D	
	08-17A	9/10/12	32-41B	7/7/12	56-17C		16-09D	
	08-49A		32-33B		56-25C		48-41D	
	08-25A	5/29/12	16-17B		40-41C	5/6/12	32-49D	5/7/12
	40-57A	(Date)	16-49B	9/16/12	24-25C		32-17D	
	24-41A	4/20/12	48-17B		24-57C	12/1/12	48-33D	
	24-09A	4/20/12	48-49B	10/31/12	08-41C		16-33D	
	56-41A	7/11/12			40-09C	10/25/12		
	40-25A	9/9/12						
APRM2	32-57A		56-33B		32-09C		08-33D	
	16-41A		40-17B		32-41C		24-17D	
	48-41A		08-49B		16-25C	5/1/12	56-17D	
	32-25A		40-49B		16-57C		40-33D	7/9/12
	16-09A		24-33B	8/8/12	48-25C	4/11/12	24-49D	
	48-09A		08-17B		56-41C		32-33D	
	08-41A		32-17B		40-25C		48-49D	
	24-25A		32-49B	5/7/12	24-09C	old ~~10/25/12~~	48-17D	
	40-09A		16-33B		24-41C		16-17D	
	24-57A		48-33B		40-57C		16-49D	9/10/12
	56-25A				08-25C			
	40-41A	2/7/12						
APRM3	08-33A		32-57B	6/5/12	56-33C	8/29/12	32-09D	
	24-49A		48-41B	6/5/12	24-33C	8/8/12	48-25D	
	24-17A		16-41B		40-49C	10/3/12	16-25D	8/12/12
	40-33A		48-09B		08-17C		16-57D	
	56-17A		32-25B		08-49C		32-41D	
	32-33A		16-09B		40-17C		08-25D	9/5/12
	16-17A		56-25B		32-49C	5/7/12	24-41D	
	48-17A		40-41B		32-17C		24-09D	
	48-49A		24-57B		48-33C		56-41D	
	16-49A		24-25B		16-33C		40-57D	
			08-41B				40-25D	
			40-09B					

LPRM vs. APRM Status Control Log
(Inoperable LPRM's are circled)

UNIT 1 or 2 (Circle Unit)	LPRM LOCATIONS							
APRM4	32-09A		08-33B		32-57C		56-33D	
	16-25A		24-49B		32-25C		40-49D	
	48-25A		24-17B		16-41C	4/1/12	08-17D	8/11/12
	32-41A		56-17B		48-41C		24-33D	
	16-57A		40-33B		16-09C		08-49D	
	32-17A		56-41B		48-09C		40-17D	
	32-49A	5/7/12	40-25B		32-33C		08-41D	
	16-33A		24-41B		16-49C		40-09D	4/12/12
	48-33A		08-25B		48-49C		24-25D	
			40-57B	5/30/12	16-17C		56-25D	
			24-09B		48-17C		24-57D	~~1/13/13~~ dlw
							40-41D	

LPRM Operability Assessment Complete J Smith / prev. Monday / 0145
Shift Supervision / Date / Time

LPRM vs. OPRM Status				
LPRM	OPRM Cells (APRM/OPRM – Cell)			
08-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	APRM1-Cell 21	2-21	3-21	4-21
08-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-15	4-15	2-15	3-15
	1-21	4-21	2-21	3-21
08-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-09	4-09	1-09	2-09
	3-15	4-15	1-15	2-15
08-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-04	3-04	1-04	4-04
	2-09	3-09	1-09	4-09
08-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-04	2-04	3-04	4-04
16-09	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-27	3-27	4-27	1-27
16-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-21	1-21	4-21	2-21
	3-22	1-22	4-22	2-22
	3-27	1-27	4-27	2-27
16-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-15	1-15	2-15	3-15
	4-16	1-16	2-16	3-16
	4-21	1-21	2-21	3-21
	4-22	1-22	2-22	3-22
16-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-09	2-09	3-09	1-09
	4-10	2-10	3-10	1-10
	4-15	2-15	3-15	1-15
	4-16	2-16	3-16	1-16
16-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-04	3-04	4-04	1-04
	2-05	3-05	4-05	1-05
	2-09	3-09	4-09	1-09
	2-10	3-10	4-10	1-10
16-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-01	1-01	4-01	2-01
	3-04	1-04	4-04	2-04
	3-05	1-05	4-05	2-05
16-57	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-01	1-01	2-01	3-01
24-09	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-27	4-27	2-27	3-27
	1-28	4-28	2-28	3-28
24-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-22	4-22	1-22	2-22
	3-23	4-23	1-23	2-23
	3-27	4-27	1-27	2-27
	3-28	4-28	1-28	2-28

LPRM vs. OPRM Status				
LPRM	OPRM Cells (APRM/OPRM – Cell)			
24-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	APRM2-Cell16	3-16	1-16	4-16
	2-17	3-17	1-17	4-17
	2-22	3-22	1-22	4-22
	2-23	3-23	1-23	4-23
24-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-10	2-10	3-10	4-10
	1-11	2-11	3-11	4-11
	1-16	2-16	3-16	4-16
	1-17	2-17	3-17	4-17
24-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-05	4-05	2-05	3-05
	1-06	4-06	2-06	3-06
	1-10	4-10	2-10	3-10
	1-11	4-11	2-11	3-11
24-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-01	4-01	1-01	2-01
	3-02	4-02	1-02	2-02
	3-05	4-05	1-05	2-05
	3-06	4-06	1-06	2-06
24-57	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-01	3-01	1-01	4-01
	2-02	3-02	1-02	4-02
32-09	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-28	1-28	2-28	3-28
	4-29	1-29	2-29	3-29
32-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-23	2-23	3-23	1-23
	4-24	2-24	3-24	1-24
	4-28	2-28	3-28	1-28
	4-29	2-29	3-29	1-29
32-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-17	3-17	4-17	1-17
	2-18	3-18	4-18	1-18
	2-23	3-23	4-23	1-23
	2-24	3-24	4-24	1-24
32-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-11	1-11	4-11	2-11
	3-12	1-12	4-12	2-12
	3-17	1-17	4-17	2-17
	3-18	1-18	4-18	2-18
32-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-06	1-06	2-06	3-06
	4-07	1-07	2-07	3-07
	4-11	1-11	2-11	3-11
	4-12	1-12	2-12	3-12
32-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-02	2-02	3-02	1-02
	4-03	2-03	3-03	1-03
	4-06	2-06	3-06	1-06
	4-07	2-07	3-07	1-07

LPRM vs. OPRM Status				
LPRM	OPRM Cells (APRM/OPRM – Cell)			
32-57	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	APRM2-Cell 02	3-02	4-02	1-02
	2-03	3-03	4-03	1-03
40-09	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-29	3-29	1-29	4-29
	2-30	3-30	1-30	4-30
40-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-24	2-24	3-24	4-24
	1-25	2-25	3-25	4-25
	1-29	2-29	3-29	4-29
	1-30	2-30	3-30	4-30
40-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-18	4-18	2-18	3-18
	1-19	4-19	2-19	3-19
	1-24	4-24	2-24	3-24
	1-25	4-25	2-25	3-25
40-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-12	4-12	1-12	2-12
	3-13	4-13	1-13	2-13
	3-18	4-18	1-18	2-18
	3-19	4-19	1-19	2-19
40-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-07	3-07	1-07	4-07
	2-08	3-08	1-08	4-08
	2-12	3-12	1-12	4-12
	2-13	3-13	1-13	4-13
40-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-03	2-03	3-03	4-03
	1-07	2-07	3-07	4-07
	1-08	2-08	3-08	4-08
40-57	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-03	4-03	2-03	3-03
48-09	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-30	3-30	4-30	1-30
48-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-25	1-25	4-25	2-25
	3-26	1-26	4-26	2-26
	3-30	1-30	4-30	2-30
48-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-19	1-19	2-19	3-19
	4-20	1-20	2-20	3-20
	4-25	1-25	2-25	3-25
	4-26	1-26	2-26	3-26
48-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-13	2-13	3-13	1-13
	4-14	2-14	3-14	1-14
	4-19	2-19	3-19	1-19
	4-20	2-20	3-20	1-20

LPRM vs. OPRM Status				
LPRM	OPRM Cells (APRM/OPRM – Cell)			
48-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	APRM2-Cell 08	3-08	4-08	1-08
	2-13	3-13	4-13	1-13
	2-14	3-14	4-14	1-14
48-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-08	1-08	4-08	2-08
56-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-26	4-26	1-26	2-26
56-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-20	3-20	1-20	4-20
	2-26	3-26	1-26	4-26
56-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-14	2-14	3-14	4-14
	1-20	2-20	3-20	4-20
56-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-14	4-14	2-14	3-14

OPRM Status Control Log

OPRM Cell Assignments for APRM 1

LPRM(s): 24-57C (to be bypassed) 40-57A
Impacted Cell(s): 1, 2 (from Attachment C) 3
Operable Cells: 25 (from ODA STABILITY display) 23
Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed).

CELL ID:	LPRM #1	LPRM #2	LPRM #3	LPRM #4
01	16-57B	24-57C	24-49C	16-49B
02	24-57C	32-57D	32-49D	24-49C
03	32-57D	40-57A	40-49A	32-49D
04	08-49A	16-49B	16-41D	08-41C
05	16-49B	24-49C	24-41A	16-41D
06	24-49C	32-49D	32-41B	24-41A
07	32-49D	40-49A	40-41C	32-41B
08	40-49A	48-49B	48-41D	40-41C
09	08-41C	16-41D	16-33D	08-33C
10	16-41D	24-41A	24-33A	16-33D
11	24-41A	32-41B	32-33B	24-33A
12	32-41B	40-41C	40-33C	32-33B
13	40-41C	48-41D	48-33D	40-33C
14	48-41D	56-41A	56-33A	48-33D
15	08-33C	16-33D	16-25B	08-25A
16	16-33D	24-33A	24-25C	16-25B
17	24-33A	32-33B	32-25D	24-25C
18	32-33B	40-33C	40-25A	32-25D
19	40-33C	48-33D	48-25B	40-25A
20	48-33D	56-33A	56-25C	48-25B
21	08-25A	16-25B	16-17B	08-17A
22	16-25B	24-25C	24-17C	16-17B
23	24-25C	32-25D	32-17D	24-17C
24	32-25D	40-25A	40-17A	32-17D
25	40-25A	48-25B	48-17B	40-17A
26	48-25B	56-25C	56-17C	48-17B
27	16-17B	24-17C	24-09A	16-09D
28	24-17C	32-17D	32-09B	24-09A
29	32-17D	40-17A	40-09C	32-09B
30	40-17A	48-17B	48-09D	40-09C

If bypassing LPRM will results in < 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.
Inoperable Cells due to bypassing LPRM(s): 2 1
Operable Cells: 23 (following bypass of LPRM(s)) 22
If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).

OPRM Status Control Log

OPRM Cell Assignments for APRM 2

LPRM(s): 24-57C (to be bypassed)
Impacted Cell(s): None (from Attachment C)
Operable Cells: 30 (from ODA STABILITY display)
Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed).

CELL ID:	LPRM #1	LPRM #2	LPRM #3	LPRM #4
1	16-57C	24-57A	24-49D	16-49D
2	24-57A	32-57A	32-49B	24-49D
3	32-57A	40-57C	40-49B	32-49B
4	08-49B	16-49D	16-41A	08-41A
5	16-49D	24-49D	24-41C	16-41A
6	24-49D	32-49B	32-41C	24-41C
7	32-49B	40-49B	40-41A	32-41C
8	40-49B	48-49D	48-41A	40-41A
9	08-41A	16-41A	16-33B	08-33D
10	16-41A	24-41C	24-33B	16-33B
11	24-41C	32-41C	32-33D	24-33B
12	32-41C	40-41A	40-33D	32-33D
13	40-41A	48-41A	48-33B	40-33D
14	48-41A	56-41C	56-33B	48-33B
15	08-33D	16-33B	16-25C	08-25C
16	16-33B	24-33B	24-25A	16-25C
17	24-33B	32-33D	32-25A	24-25A
18	32-33D	40-33D	40-25C	32-25A
19	40-33D	48-33B	48-25C	40-25C
20	48-33B	56-33B	56-25A	48-25C
21	08-25C	16-25C	16-17D	08-17B
22	16-25C	24-25A	24-17D	16-17D
23	24-25A	32-25A	32-17B	24-17D
24	32-25A	40-25C	40-17B	32-17B
25	40-25C	48-25C	48-17D	40-17B
26	48-25C	56-25A	56-17D	48-17D
27	16-17D	24-17D	24-09C	16-09A
28	24-17D	32-17B	32-09C	24-09C
29	32-17B	40-17B	40-09A	32-09C
30	40-17B	48-17D	48-09A	40-09A

If bypassing LPRM will results in < 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.
Inoperable Cells due to bypassing LPRM(s): None
Operable Cells: 30 (following bypass of LPRM(s))
If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).

OPRM Status Control Log

OPRM Cell Assignments for APRM 3

LPRM(s): 24-57C (to be bypassed)
Impacted Cell(s): None (from Attachment C)
Operable Cells: 30 (from ODA STABILITY display)
Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed).

CELL ID:	LPRM #1	LPRM #2	LPRM #3	LPRM #4
1	16-57D	24-57B	24-49A	16-49A
2	24-57B	32-57B	32-49C	24-49A
3	32-57B	40-57D	40-49C	32-49C
4	08-49C	16-49A	16-41B	08-41B
5	16-49A	24-49A	24-41D	16-41B
6	24-49A	32-49C	32-41D	24-41D
7	32-49C	40-49C	40-41B	32-41D
8	40-49C	48-49A	48-41B	40-41B
9	08-41B	16-41B	16-33C	08-33A
10	16-41B	24-41D	24-33C	16-33C
11	24-41D	32-41D	32-33A	24-33C
12	32-41D	40-41B	40-33A	32-33A
13	40-41B	48-41B	48-33C	40-33A
14	48-41B	56-41D	56-33C	48-33C
15	08-33A	16-33C	16-25D	08-25D
16	16-33C	24-33C	24-25B	16-25D
17	24-33C	32-33A	32-25B	24-25B
18	32-33A	40-33A	40-25D	32-25B
19	40-33A	48-33C	48-25D	40-25D
20	48-33C	56-33C	56-25B	48-25D
21	08-25D	16-25D	16-17A	08-17C
22	16-25D	24-25B	24-17A	16-17A
23	24-25B	32-25B	32-17C	24-17A
24	32-25B	40-25D	40-17C	32-17C
25	40-25D	48-25D	48-17A	40-17C
26	48-25D	56-25B	56-17A	48-17A
27	16-17A	24-17A	24-09D	16-09B
28	24-17A	32-17C	32-09D	24-09D
29	32-17C	40-17C	40-09B	32-09D
30	40-17C	48-17A	48-09B	40-09B

If bypassing LPRM will results in < 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.
Inoperable Cells due to bypassing LPRM(s): ~~4~~ [illegible] ~~3~~ [illegible] None
Operable Cells: 30 (following bypass of LPRM(s))
If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).

TASK CONDITIONS

A. Unit 1 is in MODE 1 at 80% power.
B. APRM 2 is INOP and bypassed.
C. APRM Gain Calibration was last performed 5 days ago.
D. LPRM detector 40-57A caused a downscale alarm, I & C determined the detector failed, and Reactor Engineering requested bypassing the detector.
E. The PCOP has just bypassed LPRM detector 40-57A in the lower relay room.

INITIATING CUE

Perform LPRM Upscale Alarm operability tracking for LPRM detector 40-57A in accordance with OI-078-001.

TASK CONDITIONS

A. Unit 1 is in MODE 1 at 80% power.
B. APRM 2 is INOP and bypassed.
C. APRM Gain Calibration was last performed 5 days ago.
D. LPRM detector 40-57A caused a downscale alarm, I & C determined the detector failed, and Reactor Engineering requested bypassing the detector.
E. The PCOP has just bypassed LPRM detector 40-57A in the lower relay room.

INITIATING CUE

Perform LPRM Upscale Alarm operability tracking for LPRM detector 40-57A in accordance with OI-078-001.

LPRM UPSCALE ALARM STATUS CONTROL LOG

UNIT 1

	LPRM	(1)	(2)	LPRM	(1)	(2)	LPRM	(1)	(2)	LPRM	(1)	(2)	LPRM	(1)	(2)	As least 50% LPRMs Operable per Zone (Circle YES or NO)
Zone 1	16-49A			16-41A			24-49A			24-41A		✓				
	16-49B	✓		16-41B			24-49B			24-41B						YES/NO (YES circled)
	16-49C			16-41C	✓		24-49C	✓		24-41C						
Zone 2	40-49A	✓		40-41A	✓		48-49A			48-41A						
	40-49B			40-41B			48-49B	✓		48-41B	✓					YES/NO (YES circled)
	40-49C	✓		40-41C	✓		48-49C			48-41C						
Zone 3	16-17A			16-25A			24-17A			24-25A						
	16-17B			16-25B			24-17B			24-25B						YES/NO (YES circled)
	16-17C			16-25C		✓	24-17C			24-25C						
Zone 4	40-17A			40-25A		✓	48-17A			48-25A						
	40-17B			40-25B			48-17B			48-25B						YES/NO (YES circled)
	40-17C			40-25C			48-17C			48-25C	✓					
Zone 5	24-33A		✓	32-25A			32-33A			32-41A			40-33A			
	24-33B		✓	32-25B			32-33B			32-41B		✓	40-33B			YES/NO (YES circled)
	24-33C		✓	32-25C			32-33C			32-41C			40-33C			
Zone 6	16-09A			24-09A	✓		32-09A			40-09A			32-17A			
	16-09B			24-09B			32-09B		✓	40-09B			32-17B			YES/NO (YES circled)
	16-09C			24-09C	✓		32-09C			40-09C		✓	32-17C			
Zone 7	08-17A	✓		08-25A	✓		08-33A			08-41A			16-33A			
	08-17B			08-25B			08-33B			08-41B			16-33B			YES/NO (YES circled)
	08-17C			08-25C			08-33C	✓		08-41C			16-33C			
Zone 8	24-57A			32-57A			40-57A			32-49A		✓				
	24-57B			32-57B		✓	40-57B		✓	32-49B		✓				YES/NO (YES circled)
	24-57C	✓		32-57C			40-57C			32-49C		✓				
Zone 9	48-33A			56-25A			56-33A		✓	56-41A		✓				
	48-33B			56-25B			56-33B			56-41B						YES/NO (YES circled)
	48-33C			56-25C			56-33C		✓	56-41C						

LPRM Upscale Alarm Status Assessment Complete

J. Smith / Prev. Monday / 0145
Shift Supervision / Date / Time

LPRM vs. APRM Status Control Log
(Inoperable LPRM's are circled)

UNIT 1 or 2 (Circle Unit)	LPRM LOCATIONS							
APRM CHANNEL	A LEVEL	Date inop.	B LEVEL	Date inop.	C LEVEL	Date inop	D LEVEL	Date inop.
APRM1	56-33A	4/5/12	32-09B	6/15/12	08-33C	11/2/12	32-57D	
	40-49A	6/10/12	16-25B		40-33C		16-41D	3/5/12
	40-17A		16-57B		24-17C		48-09D	
	24-33A	7/8/12	48-25B		24-49C	3/10/12	32-25D	
	08-17A	9/10/12	32-41B	7/7/12	56-17C		16-09D	
	08-49A		32-33B		56-25C		48-41D	
	08-25A	5/29/12	16-17B		40-41C	5/6/12	32-49D	5/7/12
	40-57A		16-49B	9/16/12	24-25C		32-17D	
	24-41A	4/20/12	48-17B		24-57C	12/1/12	48-33D	
	24-09A	4/20/12	48-49B	10/31/12	08-41C		16-33D	
	56-41A	7/11/12			40-09C	10/25/12		
	40-25A	9/9/12						
APRM2	32-57A		56-33B		32-09C		08-33D	
	16-41A		40-17B		32-41C		24-17D	
	48-41A		08-49B		16-25C	5/1/12	56-17D	
	32-25A		40-49B		16-57C		40-33D	7/9/12
	16-09A		24-33B	8/8/12	48-25C	4/11/12	24-49D	
	48-09A		08-17B		56-41C		32-33D	
	08-41A		32-17B		40-25C		48-49D	
	24-25A		32-49B	5/7/12	24-09C	11/25/12	48-17D	
	40-09A		16-33B		24-41C		16-17D	
	24-57A		48-33B		40-57C		16-49D	9/10/12
	56-25A				08-25C			
	40-41A	2/7/12						
APRM3	08-33A		32-57B	6/5/12	56-33C	8/29/12	32-09D	
	24-49A		48-41B	6/5/12	24-33C	8/4/12	48-25D	
	24-17A		16-41B		40-49C	10/3/12	16-25D	8/12/12
	40-33A		48-09B		08-17C		16-57D	
	56-17A		32-25B		08-49C		32-41D	
	32-33A		16-09B		40-17C		08-25D	9/5/12
	16-17A		56-25B		32-49C	5/7/12	24-41D	
	48-17A		40-41B		32-17C		24-09D	
	48-49A		24-57B		48-33C		56-41D	
	16-49A		24-25B		16-33C		40-57D	
			08-41B				40-25D	
			40-09B					

LPRM vs. APRM Status Control Log
(Inoperable LPRM's are circled)

UNIT 1 or 2 (Circle Unit)	LPRM LOCATIONS							
APRM4	32-09A		08-33B		32-57C		56-33D	
	16-25A		24-49B		32-25C		40-49D	
	48-25A		24-17B		16-41C	4/1/12	08-17D	8/11/12
	32-41A		56-17B		48-41C		24-33D	
	16-57A		40-33B		16-09C		08-49D	
	32-17A		56-41B		48-09C		40-17D	
	32-49A	5/7/12	40-25B		32-33C		08-41D	
	16-33A		24-41B		16-49C		40-09D	4/12/12
	48-33A		08-25B		48-49C		24-25D	
			40-57B	5/30/12	16-17C		56-25D	
			24-09B		48-17C		24-57D	4/13/12
							40-41D	

LPRM Operability Assessment Complete J Smith / Prev Monday / 0145

Shift Supervision / Date / Time

LPRM vs. OPRM Status

LPRM	OPRM Cells (APRM/OPRM – Cell)			
08-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	APRM1-Cell 21	2-21	3-21	4-21
08-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-15	4-15	2-15	3-15
	1-21	4-21	2-21	3-21
08-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-09	4-09	1-09	2-09
	3-15	4-15	1-15	2-15
08-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-04	3-04	1-04	4-04
	2-09	3-09	1-09	4-09
08-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-04	2-04	3-04	4-04
16-09	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-27	3-27	4-27	1-27
16-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-21	1-21	4-21	2-21
	3-22	1-22	4-22	2-22
	3-27	1-27	4-27	2-27
16-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-15	1-15	2-15	3-15
	4-16	1-16	2-16	3-16
	4-21	1-21	2-21	3-21
	4-22	1-22	2-22	3-22
16-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-09	2-09	3-09	1-09
	4-10	2-10	3-10	1-10
	4-15	2-15	3-15	1-15
	4-16	2-16	3-16	1-16
16-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-04	3-04	4-04	1-04
	2-05	3-05	4-05	1-05
	2-09	3-09	4-09	1-09
	2-10	3-10	4-10	1-10
16-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-01	1-01	4-01	2-01
	3-04	1-04	4-04	2-04
	3-05	1-05	4-05	2-05
16-57	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-01	1-01	2-01	3-01
24-09	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-27	4-27	2-27	3-27
	1-28	4-28	2-28	3-28
24-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-22	4-22	1-22	2-22
	3-23	4-23	1-23	2-23
	3-27	4-27	1-27	2-27
	3-28	4-28	1-28	2-28

LPRM vs. OPRM Status				
LPRM	OPRM Cells (APRM/OPRM – Cell)			
24-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	APRM2-Cell16	3-16	1-16	4-16
	2-17	3-17	1-17	4-17
	2-22	3-22	1-22	4-22
	2-23	3-23	1-23	4-23
24-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-10	2-10	3-10	4-10
	1-11	2-11	3-11	4-11
	1-16	2-16	3-16	4-16
	1-17	2-17	3-17	4-17
24-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-05	4-05	2-05	3-05
	1-06	4-06	2-06	3-06
	1-10	4-10	2-10	3-10
	1-11	4-11	2-11	3-11
24-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-01	4-01	1-01	2-01
	3-02	4-02	1-02	2-02
	3-05	4-05	1-05	2-05
	3-06	4-06	1-06	2-06
24-57	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-01	3-01	1-01	4-01
	2-02	3-02	1-02	4-02
32-09	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-28	1-28	2-28	3-28
	4-29	1-29	2-29	3-29
32-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-23	2-23	3-23	1-23
	4-24	2-24	3-24	1-24
	4-28	2-28	3-28	1-28
	4-29	2-29	3-29	1-29
32-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-17	3-17	4-17	1-17
	2-18	3-18	4-18	1-18
	2-23	3-23	4-23	1-23
	2-24	3-24	4-24	1-24
32-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-11	1-11	4-11	2-11
	3-12	1-12	4-12	2-12
	3-17	1-17	4-17	2-17
	3-18	1-18	4-18	2-18
32-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-06	1-06	2-06	3-06
	4-07	1-07	2-07	3-07
	4-11	1-11	2-11	3-11
	4-12	1-12	2-12	3-12
32-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-02	2-02	3-02	1-02
	4-03	2-03	3-03	1-03
	4-06	2-06	3-06	1-06
	4-07	2-07	3-07	1-07

LPRM vs. OPRM Status				
LPRM	OPRM Cells (APRM/OPRM – Cell)			
32-57	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	APRM2-Cell 02	3-02	4-02	1-02
	2-03	3-03	4-03	1-03
40-09	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-29	3-29	1-29	4-29
	2-30	3-30	1-30	4-30
40-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-24	2-24	3-24	4-24
	1-25	2-25	3-25	4-25
	1-29	2-29	3-29	4-29
	1-30	2-30	3-30	4-30
40-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-18	4-18	2-18	3-18
	1-19	4-19	2-19	3-19
	1-24	4-24	2-24	3-24
	1-25	4-25	2-25	3-25
40-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-12	4-12	1-12	2-12
	3-13	4-13	1-13	2-13
	3-18	4-18	1-18	2-18
	3-19	4-19	1-19	2-19
40-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-07	3-07	1-07	4-07
	2-08	3-08	1-08	4-08
	2-12	3-12	1-12	4-12
	2-13	3-13	1-13	4-13
40-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-03	2-03	3-03	4-03
	1-07	2-07	3-07	4-07
	1-08	2-08	3-08	4-08
40-57	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-03	4-03	2-03	3-03
48-09	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-30	3-30	4-30	1-30
48-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-25	1-25	4-25	2-25
	3-26	1-26	4-26	2-26
	3-30	1-30	4-30	2-30
48-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-19	1-19	2-19	3-19
	4-20	1-20	2-20	3-20
	4-25	1-25	2-25	3-25
	4-26	1-26	2-26	3-26
48-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	4-13	2-13	3-13	1-13
	4-14	2-14	3-14	1-14
	4-19	2-19	3-19	1-19
	4-20	2-20	3-20	1-20

LPRM vs. OPRM Status				
LPRM	OPRM Cells (APRM/OPRM – Cell)			
48-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	APRM2-Cell 08	3-08	4-08	1-08
	2-13	3-13	4-13	1-13
	2-14	3-14	4-14	1-14
48-49	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-08	1-08	4-08	2-08
56-17	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	3-26	4-26	1-26	2-26
56-25	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	2-20	3-20	1-20	4-20
	2-26	3-26	1-26	4-26
56-33	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-14	2-14	3-14	4-14
	1-20	2-20	3-20	4-20
56-41	A LEVEL	B LEVEL	C LEVEL	D LEVEL
	1-14	4-14	2-14	3-14

OPRM Status Control Log

OPRM Cell Assignments for APRM 1

LPRM(s): 24-57C (to be bypassed)
Impacted Cell(s): 01, 02 (from Attachment C)
Operable Cells: 25 (from ODA STABILITY display)
Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed).

CELL ID:	LPRM #1	LPRM #2	LPRM #3	LPRM #4
01	16-57B	24-57C	24-49C	16-49B
02	24-57C	32-57D	32-49D	24-49C
03	32-57D	40-57A	40-49A	32-49D
04	08-49A	16-49B	16-41D	08-41C
05	16-49B	24-49C	24-41A	16-41D
06	24-49C	32-49D	32-41B	24-41A
07	32-49D	40-49A	40-41C	32-41B
08	40-49A	48-49B	48-41D	40-41C
09	08-41C	16-41D	16-33D	08-33C
10	16-41D	24-41A	24-33A	16-33D
11	24-41A	32-41B	32-33B	24-33A
12	32-41B	40-41C	40-33C	32-33B
13	40-41C	48-41D	48-33D	40-33C
14	48-41D	56-41A	56-33A	48-33D
15	08-33C	16-33D	16-25B	08-25A
16	16-33D	24-33A	24-25C	16-25B
17	24-33A	32-33B	32-25D	24-25C
18	32-33B	40-33C	40-25A	32-25D
19	40-33C	48-33D	48-25B	40-25A
20	48-33D	56-33A	56-25C	48-25B
21	08-25A	16-25B	16-17B	08-17A
22	16-25B	24-25C	24-17C	16-17B
23	24-25C	32-25D	32-17D	24-17C
24	32-25D	40-25A	40-17A	32-17D
25	40-25A	48-25B	48-17B	40-17A
26	48-25B	56-25C	56-17C	48-17B
27	16-17B	24-17C	24-09A	16-09D
28	24-17C	32-17D	32-09B	24-09A
29	32-17D	40-17A	40-09C	32-09B
30	40-17A	48-17B	48-09D	40-09C

If bypassing LPRM will results in < 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.
Inoperable Cells due to bypassing LPRM(s): 01, 02
Operable Cells: 23 (following bypass of LPRM(s))
If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).

OPRM Status Control Log

OPRM Cell Assignments for APRM 2

LPRM(s): 24-57C (to be bypassed)
Impacted Cell(s): None (from Attachment C)
Operable Cells: 30 (from ODA STABILITY display)
Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed).

CELL ID:	LPRM #1	LPRM #2	LPRM #3	LPRM #4
1	16-57C	24-57A	24-49D	16-49D
2	24-57A	32-57A	32-49B	24-49D
3	32-57A	40-57C	40-49B	32-49B
4	08-49B	16-49D	16-41A	08-41A
5	16-49D	24-49D	24-41C	16-41A
6	24-49D	32-49B	32-41C	24-41C
7	32-49B	40-49B	40-41A	32-41C
8	40-49B	48-49D	48-41A	40-41A
9	08-41A	16-41A	16-33B	08-33D
10	16-41A	24-41C	24-33B	16-33B
11	24-41C	32-41C	32-33D	24-33B
12	32-41C	40-41A	40-33D	32-33D
13	40-41A	48-41A	48-33B	40-33D
14	48-41A	56-41C	56-33B	48-33B
15	08-33D	16-33B	16-25C	08-25C
16	16-33B	24-33B	24-25A	16-25C
17	24-33B	32-33D	32-25A	24-25A
18	32-33D	40-33D	40-25C	32-25A
19	40-33D	48-33B	48-25C	40-25C
20	48-33B	56-33B	56-25A	48-25C
21	08-25C	16-25C	16-17D	08-17B
22	16-25C	24-25A	24-17D	16-17D
23	24-25A	32-25A	32-17B	24-17D
24	32-25A	40-25C	40-17B	32-17B
25	40-25C	48-25C	48-17D	40-17B
26	48-25C	56-25A	56-17D	48-17D
27	16-17D	24-17D	24-09C	16-09A
28	24-17D	32-17B	32-09C	24-09C
29	32-17B	40-17B	40-09A	32-09C
30	40-17B	48-17D	48-09A	40-09A

If bypassing LPRM will results in < 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.
Inoperable Cells due to bypassing LPRM(s): None
Operable Cells: 30 (following bypass of LPRM(s))
If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).

OPRM Status Control Log

OPRM Cell Assignments for APRM 3

LPRM(s): 24-57C (to be bypassed)
Impacted Cell(s): None (from Attachment C)
Operable Cells: 30 (from ODA STABILITY display)
Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed).

CELL ID:	LPRM #1	LPRM #2	LPRM #3	LPRM #4
1	16-57D	24-57B	24-49A	16-49A
2	24-57B	32-57B	32-49C	24-49A
3	32-57B	40-57D	40-49C	32-49C
4	08-49C	16-49A	16-41B	08-41B
5	16-49A	24-49A	24-41D	16-41B
6	24-49A	32-49C	32-41D	24-41D
7	32-49C	40-49C	40-41B	32-41D
8	40-49C	48-49A	48-41B	40-41B
9	08-41B	16-41B	16-33C	08-33A
10	16-41B	24-41D	24-33C	16-33C
11	24-41D	32-41D	32-33A	24-33C
12	32-41D	40-41B	40-33A	32-33A
13	40-41B	48-41B	48-33C	40-33A
14	48-41B	56-41D	56-33C	48-33C
15	08-33A	16-33C	16-25D	08-25D
16	16-33C	24-33C	24-25B	16-25D
17	24-33C	32-33A	32-25B	24-25B
18	32-33A	40-33A	40-25D	32-25B
19	40-33A	48-33C	48-25D	40-25D
20	48-33C	56-33C	56-25B	48-25D
21	08-25D	16-25D	16-17A	08-17C
22	16-25D	24-25B	24-17A	16-17A
23	24-25B	32-25B	32-17C	24-17A
24	32-25B	40-25D	40-17C	32-17C
25	40-25D	48-25D	48-17A	40-17C
26	48-25D	56-25B	56-17A	48-17A
27	16-17A	24-17A	24-09D	16-09B
28	24-17A	32-17C	32-09D	24-09D
29	32-17C	40-17C	40-09B	32-09D
30	40-17C	48-17A	48-09B	40-09B

If bypassing LPRM will results in < 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.
Inoperable Cells due to bypassing LPRM(s): None
Operable Cells: 30 (following bypass of LPRM(s))
If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).

OPRM Status Control Log

OPRM Cell Assignments for APRM 4

LPRM(s): 24-57C (to be bypassed)
Impacted Cell(s): None (from Attachment C)
Operable Cells: 30 (from ODA STABILITY display)
Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed).

CELL ID:	LPRM #1	LPRM #2	LPRM #3	LPRM #4
1	16-57A	24-57D	24-49B	16-49C
2	24-57D	32-57C	32-49A	24-49B
3	32-57C	40-57B	40-49D	32-49A
4	08-49D	16-49C	16-41C	08-41D
5	16-49C	24-49B	24-41B	16-41C
6	24-49B	32-49A	32-41A	24-41B
7	32-49A	40-49D	40-41D	32-41A
8	40-49D	48-49C	48-41C	40-41D
9	08-41D	16-41C	16-33A	08-33B
10	16-41C	24-41B	24-33D	16-33A
11	24-41B	32-41A	32-33C	24-33D
12	32-41A	40-41D	40-33B	32-33C
13	40-41D	48-41C	48-33A	40-33B
14	48-41C	56-41B	56-33D	48-33A
15	08-33B	16-33A	16-25A	08-25B
16	16-33A	24-33D	24-25D	16-25A
17	24-33D	32-33C	32-25C	24-25D
18	32-33C	40-33B	40-25B	32-25C
19	40-33B	48-33A	48-25A	40-25B
20	48-33A	56-33D	56-25D	48-25A
21	08-25B	16-25A	16-17C	08-17D
22	16-25A	24-25D	24-17B	16-17C
23	24-25D	32-25C	32-17A	24-17B
24	32-25C	40-25B	40-17D	32-17A
25	40-25B	48-25A	48-17C	40-17D
26	48-25A	56-25D	56-17B	48-17C
27	16-17C	24-17B	24-09B	16-09C
28	24-17B	32-17A	32-09A	24-09B
29	32-17A	40-17D	40-09D	32-09A
30	40-17D	48-17C	48-09C	40-09D

If bypassing LPRM will results in < 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.
Inoperable Cells due to bypassing LPRM(s): None
Operable Cells: 30 (following bypass of LPRM(s))
If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).
If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).

OPRM Operability Assessment Complete J. Smith / prev. Monday / 0145
Shift Supervision / Date / Time

Additional SRO Only Cue

Determine the required actions based on your findings.

Additional SRO Only Cue

Determine the required actions based on your findings.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Classify Emergency Conditions and Make Notification

SRO	00.EP.003.082	3	03/25/2013	Classroom
Appl To	JPM Number	Revision	Date	Setting
G	2.4.44	4.4	N	Y
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/25/2013	25
Author	Date	Validation Time (min)

Validated / Approval

RCH	3/28/2013	Conway B Boff	4/9/2013
Operations Instructor	Date	Nuclear Trng Supv	Date

Examinee Name: ______________________ ______________________

Last, First MI — Employee Number

Exam Date: ______________ Exam Duration (Min) ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________

Name — Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
SRO 00.EP.003.082

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. EP-TP-001, EAL CLASSIFICATION LEVELS (REV 6)

B. EP-PS-100, EMERGENCY DIRECTOR, CONTROL ROOM EMERGENCY PLAN POSITION SPECIFIC INSTRUCTION (REV 27)

III. OPERATIONAL ACTIVITIES

None.

IV. TASK CONDITIONS

A. Unit 1 and Unit 2 were initially operating at 100% power.

B. An earthquake occurred.

C. The earthquake magnitude has been determined to be above the OBE level and below the SSE level.

D. Both Units have scrammed.

E. Power was then lost to both T-10 and T-20 15 minutes ago.

F. All Emergency Diesel Generators initially failed to start.

G. EDGs C and D have been started and are powering the 1C and 1D ESS buses only.

H. Breakers 2A20304, DG C TO BUS 2C, and 2A20404, DG D TO BUS 2D, are unable to be closed from the Control Room or locally.

I. Damage to other EDGs is expected to prevent start within 15 minutes.

J. A loss of coolant accident occurred on Unit 1.

K. The following conditions now exist on Unit 1 and Unit 2:

Parameter	Unit 1	Unit 2
Reactor water level	-105 inches down slow	-20 inches down slow

Reactor pressure	400 psig down slow	950 psig down slow
Drywell pressure	12 psig up slow	1.5 psig up slow
Drywell temperature	235°F up slow	165°F up slow

K. You are the Shift Manager.

L. Wind direction is 10 degrees and speed is 5 mph.

M. No initial emergency classification has been made yet.

V. INITIATING CUE

Classify the event and implement the Emergency Plan as the Control Room Emergency Director in accordance with EP-PS-100.

VI. TASK STANDARD

Candidate declares Site Area Emergency MS1 within 15 minutes. Candidate then upgrades classification to General Emergency FG1 within 15 minutes of being given second cue sheet. Candidate completes ENR form, directs notification of offsite agencies, and determines Protective Action Recommendations within 15 minutes of declaration.

VII. TASK SAFETY SIGNIFICANCE

Proper Emergency Plan implementation is required to provide reasonable assurance that public health and safety is not endangered by operation of the facility, and that adequate protective measures can and will be taken in the event of an emergency.

Appl. To/JPM No.: 00.EP.003.082 Student Name:____________________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE Ensure the following material is available to support performance of this JPM: • A copy of EP-TP-001. • A copy of EP-TP-003. • A copy of EP-PS-100. • Extra copies of all forms to be marked up. **EVALUATOR CUE:** To begin this JPM, provide the candidate with Task Conditions and Initiating Cue Sheet. Once the candidate has acknowledged the initial conditions, inform the candidate that this is a time critical JPM and record the start time. JPM Start Time: __________			
1.	Obtain a controlled copy of the procedure.	Obtains a controlled copy of the applicable procedure(s).		
2.	Performs EP-PS-100 Tab A actions.	Proceeds to EP-PS-100 Tab A.		

Appl. To/JPM No.: 00.EP.003.082 Student Name:________________________

Step	Action	Standard	Eval	Comments
3.	Evaluate information. **EVALUATOR CUE** If asked for updated information, report that conditions are the same as in the initial conditions.	Evaluates initial conditions. May ask for updated information from: • STA for rad release. • US for plant status. • SCC for security events.		
4.	Choose most appropriate Emergency Classification level from Emergency Classification Matrix. JPM Start Time: ________ Time of Emergency Classification: ________ Time Difference: ________ **EVALUATOR NOTE** This time difference must be ≤ 15 minutes. **EVALUATOR NOTE** Once the candidate makes the classification from the initial conditions, provide the candidate with the second cue sheet.	Determines Site Area Emergency MS1 is the appropriate classification.		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.EP.003.082 Student Name:________________________

Step	Action	Standard	Eval	Comments
5.	Re-evaluate information. **<u>EVALUATOR CUE</u>** If asked for updated information, report that conditions are the same as in the given conditions.	Evaluates initial conditions. May ask for updated information from: • STA for rad release. • US for plant status. • SCC for security events.		
6.	Choose most appropriate Emergency Classification level from Emergency Classification Matrix.	Determines General Emergency FG1 is the appropriate classification.		
7.	Manage all Security EALs. Immediately go to appropriate classification TAB for all other EALs.	Proceeds to EP-PS-100 Tab E for a General Emergency.		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.EP.003.082 Student Name:________________________

Step	Action	Standard	Eval	Comments
✱8.	Document and communicate the Emergency Classification. Time of Acknowledgement of Second Cue Sheet: ________ Time of Emergency Classification Announcement to Control Room: ________ Time Difference: ________ **EVALUATOR NOTE** This time difference must be ≤ 15 minutes.	Announces to the Control Room: • I am assuming duties of Emergency Director. • Emergency classification is General Emergency FG1 (or similar). • Time of classification is (current time).		
9.	Appoint an Emergency Plan Communicator. **EVALUATOR ROLE PLAY** Acknowledge direction.	Directs an individual to perform EP-PS-126 actions as Emergency Plan Communicator.		
10.	Appoint an NRC Communicator. **EVALUATOR ROLE PLAY** Acknowledge direction.	Directs an individual to perform EP-PS-135 actions as NRC Communicator.		

✱Critical Step #Critical Sequence

Appl. To/JPM No.: 00.EP.003.082 Student Name:________________________

Step	Action	Standard	Eval	Comments
∗11.	Generate and review ENR form to be transmitted with the E Plan Communicator. Time of Emergency Classification Announcement to Control Room: ________ Time of Direction to Make ENR Notification: ________ Time Difference: ________ **EVALUATOR NOTE** This time difference must be ≤ 15 minutes. **EVALUATOR NOTE** ENR form items 3, 4, and 5 are critical. Other items are NOT critical. **EVALUATOR CUE** Once the candidate directs notification, inform the candidate that the JPM is complete.	Fills out ENR form (see attached key). Reviews ENR form with Emergency Plan Communicator. Directs Emergency Plan Communicator to make notification.		
12.	When a General Emergency is declared, make Protective Action Recommendation (PAR) within 15 minutes.	Proceeds to EP-PS-100 Tab 5, Public Protective Action Recommendation Guide.		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 00.EP.003.082 Student Name:______________________

Step	Action	Standard	Eval	Comments
✳13.	Choose appropriate PAR. • Shelter • Evacuate 0-2 miles/Shelter 2-10 miles • Evacuate 0-10 miles	Chooses PAR to evacuate 0-2 miles, shelter 2-10 miles, and advise citizens to take KI in accordance with the state's emergency plans.		
✳14.	Shift Manager/ED shall notify the Senior State Official, using the PAR State Notification Form, at 717-651-2148. Time of Emergency Classification Announcement to Control Room: ________ Time of Notification Start to Senior State Official: ________ Time Difference: ________ **EVALUATOR NOTE** This time difference must be ≤ 15 minutes. **EVALUATOR CUE** Once the candidate simulates/indicates dialing the number to notify the senior state official, inform the candidate that the JPM is complete.	Indicates need to notify Senior State Official.		

✳Critical Step #Critical Sequence

EVALUATOR'S KEY

Control # CR-2

1. Call Status: ☒ **THIS IS A DRILL** ☐ **THIS IS AN ACTUAL EVENT**

2. This is: ______________________ at PPL Susquehanna, LLC
(Communicator's Name)

My telephone number is: 570-542 3______ / 570-759 4______
(Callback telephone number)

Notification time is: ______________.
(Time notification initiated)

3. **EMERGENCY CLASSIFICATION:**
☐ UNUSUAL EVENT ☐ SITE AREA EMERGENCY
☐ ALERT ☒ GENERAL EMERGENCY ☐ **The event has been terminated.**

UNIT: ☒ ONE ☐ TWO ☐ ONE & TWO

Declaration Time: (Time)
(Time classification/ termination declared)

DATE: (Date)
(Date classification/ termination declared)

THIS REPRESENTS A/AN: ☐ INITIAL DECLARATION ☒ ESCALATION ☐ NO CHANGE } **IN CLASSIFICATION STATUS**

4. **The Classification Designation is**: FG1

BRIEF NON-TECHNICAL DESCRIPTION OF THE:
☒ **EMERGENCY EVENT (Initial declaration and escalations) OR**
☐ **OTHER SIGNIFICANT EVENT (No change in emergency classification or classification time)**

(Attaches event description sticker here)

5. **THERE IS:** ☐ NO ☒ AN AIRBORNE ☐ A LIQUID } **RADIOLOGICAL RELEASE IN PROGRESS DUE TO THE EVENT**

6. **WIND DIRECTION IS** 10 **degrees** **WIND SPEED IS:** 5 **mph**
(Data from 10 meter meteorological tower, available on PICSY.)

7. **REPEAT:** ☒ **THIS IS A DRILL** ☐ **THIS IS AN ACTUAL EVENT**

(When communicating form, request a repeat back by one of the agencies.)

APPROVED: (Signature) **Time:** (Time) **Date:** (Date)
(ED, RM, or EOFSS) (Time form approved) (Date form approved)

EVALUATOR'S KEY

TASK CONDITIONS

A. Unit 1 and Unit 2 were initially operating at 100% power.

B. An earthquake occurred.

C. The earthquake magnitude has been determined to be above the OBE level and below the SSE level.

D. Both Units have scrammed.

E. Power was then lost to both T-10 and T-20 15 minutes ago.

F. All Emergency Diesel Generators initially failed to start.

G. EDGs C and D have been started and are powering the 1C and 1D ESS buses only.

H. Breakers 2A20304, DG C TO BUS 2C, and 2A20404, DG D TO BUS 2D, are unable to be closed from the Control Room or locally.

I. Damage to other EDGs is expected to prevent start within 15 minutes.

J. A loss of coolant accident occurred on Unit 1.

K. The following conditions now exist on Unit 1 and Unit 2:

Parameter	Unit 1	Unit 2
Reactor water level	-105 inches down slow	-20 inches down slow
Reactor pressure	400 psig down slow	950 psig down slow
Drywell pressure	12 psig up slow	1.5 psig up slow
Drywell temperature	235°F up slow	165°F up slow

K. You are the Shift Manager.

L. Wind direction is 10 degrees and speed is 5 mph.

M. No initial emergency classification has been made yet.

INITIATING CUE

Classify the event and implement the Emergency Plan as the Control Room Emergency Director in accordance with EP-PS-100.

TASK CONDITIONS

A. Unit 1 and Unit 2 were initially operating at 100% power.

B. An earthquake occurred.

C. The earthquake magnitude has been determined to be above the OBE level and below the SSE level.

D. Both Units have scrammed.

E. Power was then lost to both T-10 and T-20 15 minutes ago.

F. All Emergency Diesel Generators initially failed to start.

G. EDGs C and D have been started and are powering the 1C and 1D ESS buses only.

H. Breakers 2A20304, DG C TO BUS 2C, and 2A20404, DG D TO BUS 2D, are unable to be closed from the Control Room or locally.

I. Damage to other EDGs is expected to prevent start within 15 minutes.

J. A loss of coolant accident occurred on Unit 1.

K. The following conditions now exist on Unit 1 and Unit 2:

Parameter	Unit 1	Unit 2
Reactor water level	-105 inches down slow	-20 inches down slow
Reactor pressure	400 psig down slow	950 psig down slow
Drywell pressure	12 psig up slow	1.5 psig up slow
Drywell temperature	235°F up slow	165°F up slow

K. You are the Shift Manager.

L. Wind direction is 10 degrees and speed is 5 mph.

M. No initial emergency classification has been made yet.

INITIATING CUE

Classify the event and implement the Emergency Plan as the Control Room Emergency Director in accordance with EP-PS-100.

Cue Sheet #2

TASK CONDITIONS

A. All notifications for the initial classification have been completed.

B. The following conditions now exist on Unit 1 and Unit 2:

Parameter	Unit 1	Unit 2
Reactor water level	-210 inches down slow	-40 inches down slow
Reactor pressure	300 psig down slow	900 psig down slow
Drywell pressure	15 psig up slow	2.7 psig up slow
Drywell temperature	245°F up slow	190°F up slow

C. The control room crew has implemented EP-DS-002, RPV and Primary Containment Flooding Procedure, on Unit 1.

D. Containment venting is in progress on Unit 1 per EP-DS-004, Primary Containment and RPV Venting.

E. All other conditions are unchanged from the initial conditions.

D. You are the Shift Manager.

E. Wind direction is 10 degrees and speed is 5 mph.

INITIATING CUE

Classify the event and implement the Emergency Plan as the Control Room Emergency Director in accordance with EP-PS-100.

Cue Sheet #2

TASK CONDITIONS

A. All notifications for the initial classification have been completed.

B. The following conditions now exist on Unit 1 and Unit 2:

Parameter	Unit 1	Unit 2
Reactor water level	-210 inches down slow	-40 inches down slow
Reactor pressure	300 psig down slow	900 psig down slow
Drywell pressure	15 psig up slow	2.7 psig up slow
Drywell temperature	245°F up slow	190°F up slow

C. The control room crew has implemented EP-DS-002, RPV and Primary Containment Flooding Procedure, on Unit 1.

D. Containment venting is in progress on Unit 1 per EP-DS-004, Primary Containment and RPV Venting.

E. All other conditions are unchanged from the initial conditions.

D. You are the Shift Manager.

E. Wind direction is 10 degrees and speed is 5 mph.

INITIATING CUE

Classify the event and implement the Emergency Plan as the Control Room Emergency Director in accordance with EP-PS-100.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Determine LCO Applicability and Ability to Bypass Secondary Containment Zone 2 Isolation

SRO	34.OP.2683.201	1	01/29/2013	Classroom
Appl To	JPM Number	Revision	Date	Setting

G	2.3.13	3.8	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	01/29/2013	25
Author	Date	Validation Time (min)

Validated

[signature]	3/28/2013	Approval [signature]	4/8/2013
Operations Instructor	Date	Nuclear Trng Supv	Date

Examinee Name: ______________________ Last, First MI ______________ Employee Number

Exam Date: ______________ Exam Duration (Min) ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ Name ______________________ Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 34.OP.2683.201

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-234-002, Reactor Building HVAC Zones 2 and 3 (Rev. 44)

B. NDAP-QA-0321, Secondary Containment Integrity Control (Rev. 12)

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. Unit 2 is shutdown.

B. All rods were inserted 4 hours ago.

C. Plant cool down and equipment shutdown are in progress in preparation for start of a refueling outage.

D. C RHR Pump is in service in Shutdown Cooling.

E. A and B ESW pumps and 2A RHRSW Pump is in service providing cooling to the RHR system.

R. Reactor coolant temperature is 194°F and lowering.

G. Cask Storage Gates are removed.

H. All other equipment is operable.

I. I & C has requested the Secondary Containment Zone 2 Isolation bypassed to support work.

V. INITIATING CUE

Determine the ability to bypass the Secondary Containment Zone 2 Isolation. Record your findings, including any applicable references. Document your approval / disapproval of the request. Specify actions required for bypass.

VI. TASK STANDARD

Candidate determines Unit 2 Tech Spec 3.6.4.1 is Not Applicable to Mode 4, and may continue with Bypass of Secondary Containment Isolation signal for Zone 2. Candidate authorizes bypassing the Zone 2 Isolation IAW OP-234-002 and NDAP-QA-0321.

VII. TASK SAFETY SIGNIFICANCE

The secondary containment structure completely encloses the primary containment structure such that a dual-containment design is utilized to limit the spread of radioactivity to the environment to within limits. The function of the secondary containment is to contain, dilute, and hold up fission products that may leak from primary containment into secondary containment following a Design Basis Accident (DBA). If the Zone 2 Secondary Containment Isolation Signal is inappropriately bypassed radiological release limits may be exceeded.

Appl. To/JPM No.: 34.OP.2683.201 Student Name:________________________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE Ensure the following material is available to support performance of this JPM: • A copy of OP-234-002. • A copy of NDAP-QA-0321. • A copy of Technical Specifications. **EVALUATOR CUE:** To begin this JPM, provide the candidate with Task Conditions and Initiating Cue Sheet.			
1.	Obtain a controlled copy of the procedure.	Obtains a controlled copy of the applicable procedure(s).		
2.	Selects the correct section to perform.	Selects: • OP-234-002 section 2.12 and/or • NDAP-QA-0321 section 6.4 and/or • Technical Specification 3.6.4.1/3.6.4.2		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 34.OP.2683.201 Student Name:________________________

Step	Action	Standard	Eval	Comments
3.	Review NDAP-QA-0321 section 6.4.	Determines nothing in NDAP-QA-0321 prohibits bypassing the Secondary Containment Zone 2 Isolation. Determines OP-234-002 and Technical Specifications should be referenced.		
4.	Review OP-234-002 section 2.12. **EVALUATOR NOTE** Candidate may refer to TRO 3.7.10 which addresses cross-tying the Fuel Pools. Candidate may also initially refer to GO-200-006 regarding the precautions for SC Integrity.	Determines must evaluate Technical Specifications 3.6.4.1 and 3.6.4.2.		

Appl. To/JPM No.: 34.OP.2683.201 Student Name:________________

Step	Action	Standard	Eval	Comments
∗5.	Evaluate Unit 2 Tech Spec 3.6.4.1. **EVALUATOR CUE** If asked about irradiated fuel movement, inform candidate that no irradiated fuel movement is in progress. **EVALUATOR CUE** If asked about OPDRVs, inform candidate that no OPDRVs are in progress.	Determines plant is currently in Mode 4. Review Technical Specification 3.6.4.1 and determines operability of Secondary Containment is NOT required in Mode 4. Determines irradiated fuel movement and OPDRVs are not in progress based on initial conditions. Determines Technical Specification 3.6.4.1 allows bypassing of Secondary Containment Zone 2 Isolation in present plant conditions.		

∗Critical Step #Critical Sequence

Appl. To/JPM No.: 34.OP.2683.201 Student Name:______________________

Step	Action	Standard	Eval	Comments
✷6.	Evaluate Unit 2 Tech Spec 3.6.4.2. **EVALUATOR CUE** If asked about irradiated fuel movement, inform candidate that no irradiated fuel movement is in progress. **EVALUATOR CUE** If asked about OPDRVs, inform candidate that no OPDRVs are in progress. **EVALUATOR CUE** If asked about release paperwork (OP-234-002 Att J), inform candidate that OP-234-002 Attachment J has been completed and is being maintained by the Operations Outage Manager (OOM).	Determines plant is in currently in Mode 4. Determines Secondary Containment Isolation Valve operability is NOT required in Mode 4. Determines irradiated fuel movement and OPDRVs are not in progress based on initial conditions. Determines Technical Specification 3.6.4.2 allows bypassing of Secondary Containment Zone 2 Isolation in present plant conditions.		
✷7.	Complete OP-234-002 Attachment F. **EVALUATOR NOTE** Provide a blank copy of OP-234-002 Attachment F upon request.	Indicates need to fill out OP-234-002 Attachment F and indicates they would direct an operator to complete it. Indicates that after this form is completed, they would authorize isolation bypass.		

✷Critical Step #Critical Sequence

Appl. To/JPM No.: 34.OP.2683.201 Student Name:____________________

Step	Action	Standard	Eval	Comments
	EVALUATOR CUE This completes the JPM.			

✱Critical Step #Critical Sequence

TASK CONDITIONS

A. Unit 2 is shutdown.

B. All rods were inserted 4 hours ago.

C. Plant cool down and equipment shutdown are in progress in preparation for start of a refueling outage.

D. C RHR Pump is in service in Shutdown Cooling.

E. A and B ESW pumps and 2A RHRSW Pump is in service providing cooling to the RHR system.

R. Reactor coolant temperature is 194°F and lowering.

G. Cask Storage Gates are removed.

H. All other equipment is operable.

I. I & C has requested the Secondary Containment Zone 2 Isolation bypassed to support work.

INITIATING CUE

Determine the ability to bypass the Secondary Containment Zone 2 Isolation. Record your findings, including any applicable references. Document your approval / disapproval of the request. Specify actions required for bypass.

TASK CONDITIONS

A. Unit 2 is shutdown.

B. All rods were inserted 4 hours ago.

C. Plant cool down and equipment shutdown are in progress in preparation for start of a refueling outage.

D. C RHR Pump is in service in Shutdown Cooling.

E. A and B ESW pumps and 2A RHRSW Pump is in service providing cooling to the RHR system.

R. Reactor coolant temperature is 194°F and lowering.

G. Cask Storage Gates are removed.

H. All other equipment is operable.

I. I & C has requested the Secondary Containment Zone 2 Isolation bypassed to support work.

INITIATING CUE

Determine the ability to bypass the Secondary Containment Zone 2 Isolation. Record your findings, including any applicable references. Document your approval / disapproval of the request. Specify actions required for bypass.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title Perform The Monthly Diesel Generator Operability Test For "D" D/G IAW SO–024–001D

S/RO	24.SO.002.151	6	03/27/2013	Simulator
Appl To	JPM Number	Revision	Date	Setting

264000	A4.04	3.7/3.7	Y	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/27/2013	25
Author	Date	Validation Time (min)

Validated | Approval

RC	3/28/2013		4/8/13
Operations Instructor	Date	Nuclear Trng Supv R. Simmons	Date

Examinee Name: ______________________ ______________

Last, First MI | Employee Number

Exam Date: ____________ Exam Duration (Min) ____________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________

Name | Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 24.SO.002.151

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. SO–024–001D (REV 12), MONTHLY DIESEL GENERATOR 'D' OPERABILITY TEST

B. AR–016–001 (C03) (REV 47), DG D PANEL 0C521D LO PRIORITY TROUBLE

C. LA–0521–004 (F06) (REV 16), GENERATOR FIELD GROUND

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

Both Units are operating in Mode 1.

SO–024–001D, Monthly Diesel Generator Operability Test for D/G D, is in progress.

The prerequisites for the surveillance have been completed.

An operator is stationed at the diesel generator with communications established with the Control Room.

Other operators will record START times per steps 5.1.8, 5.1.9, 5.1.10 and 5.1.11.

Prelube operation is complete per step 5.1.5.

V. INITIATING CUE

Complete SO–024–001D, Monthly Diesel Generator Operability Test for 'D' D/G, beginning at step 5.1.7, synchronizing to ESS Bus 2D.

VI. TASK STANDARD

Synchronize the Diesel Generator to the grid via ESS Bus 2D and shutdown D/G based on Generator terminal voltage decay.

VII. TASK SAFETY SIGNIFICANCE

Failure to synchronize the Diesel Generator to the grid would prevent the Technical Specification required Demonstration of Diesel Generator operability. Inability to identify the need to trip the Diesel Generator and then have it shutdown would result in equipment damage to a Safety related piece of equipment

Appl. To: S/RO JPM No.: 24.SO.002.151 Student Name: ____________

Step	Action	Standard	Eval	Comments
EVALUATOR NOTE • This JPM must be performed in the simulator. • Reset the simulator to IC-381. • Ensure the simulator is setup in accordance with the attached Simulator Setup Instructions				
EVALUATOR NOTE The FAULTED step in this JPM is preceded by a fault statement in **BOLD TYPE WITH ALL CAPITAL LETTERS**.				
EVALUATOR CUE Provide the examinee a marked–up copy of SO–024–001D complete through step 5.1.6.				
BOOTH OPERATOR CUE Depress KEY 11 to reset DG D local alarms as desired.				
EVALUATOR CUE When student is ready to begin JPM, place the simulator in RUN.				
*1	**Starts** DG D.	Depresses HS–00051D, DG D START PB.		
2	**Verifies** DG D response to start.	Directs NPO to report status of DG D.		
EVALUATOR CUES The time for step 5.1.9.a was 8.8 seconds. The time for step 5.1.9.b was 9.0 seconds. Left bank pressure is 180 psig. Right bank pressure is 180 psig. The time for step 5.1.12 was 9.0 seconds. **EVALUATOR CUE** DG D response was satisfactory per SO–024–001D Step 5.1.11. **BOOTH OPERATOR** Depress KEY 11 to clear local EDG alarms.				

* = Critical Step
\# = Critical Sequence

Appl. To: S/RO JPM No.: 24.SO.002.151 Student Name:

Step	Action	Standard	Eval	Comments
3	**Records** DG starting air receiver pressures and **confirms** air start system operability.	Performs the following: • Directs NPO to report left bank and right bank starting air pressures from PI–02438D at OC521D • Records values in Step 5.1.14 • Verifies reported pressures are within 10 psig		
EVALUATOR CUE Left bank pressure 180 psig. Right bank pressure 180 psig.				
4	**Confirms** both start air compressors for DG D start.	Directs NPO to report DG D starting air compressor status.		
EVALUATOR CUE Both Number 1 and Number 2 starting air compressors started for DG D.				
EVALUATOR CUE Another operator has completed OP–024–005 Attachment A, DG Start Log.				
5	**Records** steady–state DG D frequency.	Performs the following: • Records on Attachment A indication on XI–00034D, DG D FREQ • Verifies DG D frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz		
6	**Records** steady–state DG D voltage.	Performs the following: • Records on Attachment A indication on XI–00034D, DG D VOLTS • Verifies DG D voltage $\geq$ 3793 V and $\leq$ 4400 V		
EVALUATOR CUE Five minutes have elapsed.				

* = Critical Step
\# = Critical Sequence

Appl. To: S/RO JPM No.: 24.SO.002.151 Student Name:

Step	Action	Standard	Eval	Comments
7	**Ensures** all synchroscope switches are off.	Observes all synchroscope keyswitches in OFF.		
*8	**Turns** ESS Bus 2D feeder from DG D synch switch ON.	Places DG D TO BUS 2D SYNC SEL to ON.		
9	**Checks** for excessive sparking of generator brushes.	Directs NPO to check for excessive sparking of generator brushes.		
EVALUATOR CUE No sparking of the generator brushes has been observed.				
10	**Adjusts** DG D voltage (incoming) to match offsite power voltage (running).	Places HS–00053D, DG D VOLTAGE ADJUST, to RAISE and LOWER as necessary to obtain INCOMING and RUNNING volts matched in green band of XI–00036, 4KV DIFF AC VOLTS.		
*#11	**Adjusts** DG D speed to match offsite power frequency.	Places HS–00054A, DG A SPEED GOVERNOR, to RAISE and LOWER as necessary to obtain XI–00037, SYNCHROSCOPE, rotating slowly in FAST (clockwise) direction, not exceeding 1 revolution per 60 seconds.		
EVALUATOR NOTE The following 2 steps must be performed in rapid succession to prevent DG reverse power trip.				
*#12	**Closes** ESS Bus 2D feeder from DG D when DG D in phase with offsite power.	Performs the following simultaneously: • Observes XI–00037, SYNCHROSCOPE, at or slightly before "12 O'CLOCK" position • Places DG D TO BUS 2D BKR 2A20404 to CLOSE		

* = Critical Step
\# = Critical Sequence

Appl. To: S/RO JPM No.: 24.SO.002.151 Student Name: ____________

Step	Action	Standard	Eval	Comments
*#13	**Raise** DG D load to 1000 KW over a 30–45 second period.	Places HS–00054D, DG D SPEED GOVERNOR, to RAISE (and LOWER as necessary) to obtain approximately 1000 KW as indicated on XI–00032D, DG D WATTS, over approximately 30-45 seconds.		
14	**Adjust** DG D voltage to maintain 0±900 KVAR.	Places HS–00053D, DG D VOLTAGE ADJUST, to RAISE and LOWER as necessary to obtain 0±900 KVAR indicated on PICSY.		
15	**Turns** ESS Bus 1D feeder from DG D synch switch OFF.	Places DG D TO BUS 1D SYNC SEL to OFF.		
BOOTH OPERATOR CUE With evaluator concurrence, depress KEY 2 to initiate a failure of the DG D voltage regulator.				
FAULT STATEMENT THE DG VOLTAGE REGULATOR WILL MALFUNCTION DUE TO A GENERATOR FIELD GROUND CONDITION. DG INDICATED VOLTAGE WILL LOWER.				
16	**Observes** AR–016–001 (C03) in alarm.	Performs the following: • Directs NPO to report alarms at 0C521D • Observes XI–00035D, DG D VOLTS, lowering • Observes DG D TO BUS 1D BKR 1A20404 open		
EVALUATOR CUE F06, GENERATOR FIELD GROUND, is in alarm at 0C521D.				
BOOTH OPERATOR CUE If directed by lead examiner, to perform local trip of DG D, depress KEY 3.				

* = Critical Step
\# = Critical Sequence

Appl. To: S/RO JPM No.: 24.SO.002.151 Student Name: ______________

Step	Action	Standard	Eval	Comments
*17	**Promptly shutdown** DG D.	Depresses HS–00052D, DG D STOP, PB		
EVALUATOR CUE (If local DG trip is directed) I have attempted to perform local trip of DG D, but the DG D LOCAL/REMOTE switch is stuck in REMOTE. I am unable to perform local DG D shutdown.				
EVALUATOR CUE That completes the JPM.				
EVALUATOR: Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

* = Critical Step
\# = Critical Sequence

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
S/RO 24.SO.002.151

Start ESW Pumps C and D

Perform the following expert commands to assign keys to the required malfunctions (may utilize n13jpmA.scn)

```
IMF annLA521DE01 f:ALARM_OFF

{Key[1]} SCN n13jpmA_A

{Key[2]} IOR doL56AD f:ON
{Key[2]} IOR doL56MD f:OFF
{Key[2]} IOR diHS00056D f:MANUAL
{Key[2]} IOR aoXI00035D r:2:00 f:2400
{Key[2]} IMF annLA521DF06 d:10 f:ALARM_ON
{Key[2]} IRF crfBR06_1A20404 d:5 f:TRIP
{Key[2]} IRF crfBR06_2A20404 d:5 f:TRIP
{Key[2]} IOR diHS00053D f:NEUTRAL

{Key[3]} IOR di43CMD_Q f:LOCAL
{Key[3]} IOR di5ESD_Q c:1 f:STOP
{Key[3]} DOR aoXI00035D

{Key[11]} SCN n13jpmA_B
```

n13jpmA_A.scn

```
IOR di5ESD_Q f:STOP
+1 MOR di5ESD_Q f:NORMAL
+1 DOR di5ESD_Q
+1 IOR di5ESRD_Q f:RESET
+1 MOR di5ESRD_Q f:NORMAL
+1 DOR di5ESRD_Q
+1 IOR di0C521DRST_Q f:NORMAL
+1 MOR di0C521DRST_Q f:RESET
+1 MOR di0C521DRST_Q f:NORMAL
+1 DOR di0C521DRST_Q
```

n13jpmA_B.scn

```
+1 IOR di0C521DACK_Q f:ACK
+1 MOR di0C521DACK_Q f:NORMAL
+1 DOR di0C521DACK_Q
```

TASK CONDITIONS

Both Units are operating in Mode 1.

SO–024–001D, Monthly Diesel Generator Operability Test for D/G D, is in progress.

The prerequisites for the surveillance have been completed

An operator is stationed at the diesel generator with communications established with the Control Room.

Other operators will record START times per steps 5.1.8, 5.1.9, 5.1.10 and 5.1.11.

Prelube operation is complete per step 5.1.5.

INITIATING CUE

Complete SO–024–001D, Monthly Diesel Generator Operability Test for 'D' D/G, beginning at step 5.1.7, synchronizing to ESS Bus 2D.

TASK CONDITIONS

Both Units are operating in Mode 1.

SO–024–001D, Monthly Diesel Generator Operability Test for D/G D, is in progress.

The prerequisites for the surveillance have been completed

An operator is stationed at the diesel generator with communications established with the Control Room.

Other operators will record START times per steps 5.1.8, 5.1.9, 5.1.10 and 5.1.11.

Prelube operation is complete per step 5.1.5.

INITIATING CUE

Complete SO–024–001D, Monthly Diesel Generator Operability Test for D/G D, beginning at step 5.1.7, synchronizing to ESS Bus 2D.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Add Water to Fuel Pool via RHRSW IAW ON-135-001

S/RO	35.ON.1662.101	1	03/27/2013	Simulator
Appl To	JPM Number	Revision	Date	Setting

233000	A2.02	3.1/3.3	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/27/2013	20
Author	Date	Validation Time (min)

Validated | Approval

	3/28/2013	R. Snovery	4/8/13
Operations Instructor	Date	Nuclear Trng Supv	Date

Examinee Name: ______________________ ______________________
Last, First MI | Employee Number

Exam Date: ____________ Exam Duration (Min) ____________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________
Name | Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 35.ON.1662.101

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. ON-135-001 (REV 34), LOSS OF FUEL POOL COOLING/COOLANT INVENTORY, REV 34

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. A Seismic event has occurred.

B. Unit 1 is in Mode 1.

C. Unit 1 Fuel Pool inventory is lowering due to a system breach.

D. Normal Fuel Pool makeup is unavailable.

E. A system walkdown was unable to locate the leak, however the rate of inventory loss is not severe.

F. The Unit 1 Fuel Pool Cooling System has been shutdown.

G. The Cask Storage Pit Gate is closed.

H. The Unit 1 Fuel Pool has been isolated from Non-Q piping by another operator.

I. Adding water to the fuel pool was attempted using ESW and Fire Protection, but was unsuccessful.

J. Current Unit 1 Pool level is 21' 11" down slow.

V. INITIATING CUE

Add water to the Unit 1 Fuel Pool via RHRSW through RHR Loop 'A' IAW ON-135-001 section 3.6.7.e.

VI. TASK STANDARD

Water is added to Fuel Pool using the RHRSW system.

VII. TASK SAFETY SIGNIFICANCE

Maintaining Fuel Pool inventory will prevent fuel element overheating and cladding damage.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 35.ON.1662.101 Student Name:

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE • This JPM must be performed in the simulator. • Reset the simulator to IC–381. • Ensure the simulator is setup in accordance with the attached Simulator Setup Instructions. • Prior to performing this JPM, obtain a copy of the latest revision of ON-135-001 mark it up as if it were actually to be performed, up to step 3.6.7.e, and provide it to the student along with the Task Conditions/Initiating Cue Sheet. • There are separate cue sheets for RO and SRO candidates. Provided RO candidates with only the RO cue sheet. Provide SRO candidates with only the SRO cue sheet.			
1.	Obtain a controlled copy of ON-135-001, Loss of Fuel Pool Cooling / Coolant Inventory.	Obtains Controlled copy from evaluator.		
2.	Review Sections 1.0 through 3.0.	Reviews Sections 1.0 through 3.0.		
	EVALUATOR CUE If asked about Step 3.2 or 3.3.2, inform Candidate that TS are being complied with.			
3.	Ensure the following valves CLOSED: • HV-151F023 RHR Reactor Head Spray Flow Control Vlv	Observes HV-151F023 amber light on, red light off.		

* = Critical Step
# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 35.ON.1662.101 Student Name:

Step	Action	Standard	Eval	Comments
	• HV-151F015A RHR Loop A Injection OB Iso Vlv	Observes HV-151F015A amber light on, red light off.		
	• HV-151F010A RHR Loop A Cross Tie	Observes HV-151F010A amber light off, red light off (normally closed and de-energized).		
	EVALUATOR CUE If asked about the position of valve HV-151F010A, Role Play as Unit Supervisor and report that the valve was determined to be closed by the current surveillance.			
	• HV-151F010B RHR Loop B Cross Tie	Observes HV-151F010B amber light off, red light off (normally closed and de-energized).		
	EVALUATOR CUE If asked about the position of valve HV-151F010B, Role Play as Unit Supervisor and report that the valve was determined to be closed by the current surveillance.			
	• HV-11210A Unit 1 RHR SW Hx A Inlet	Observes HV-11210A amber light on, red light off.		
	• HV-21210A Unit 2 RHRSW Hx A Inlet	Contacts Unit 2 regarding position of HV-21210A.		
	EVALUATOR CUE Role Play as Unit 2 PCOP and report valve HV-21210A is Closed.			

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 35.ON.1662.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
4.	Momentarily Place HS-E11-1S17A LOCA Isolation Manual Override Keylock Switch to override.	Rotates HS-E11-1S17A LOCA Isolation Manual Override Keylock Switch clockwise to OVRD.		
5.	Observe the following:			
	• LOCA Isolation Manual Override White Indicating Light ILLUMINATED.	Observes LOCA Isolation Manual Override White Indicating Light ILLUMINATED while HS-E11-1S17A is in OVRD, and then clears.		
	• LOCA Iso Switch Loop A Manual Override Annunciator ALARMED.	Observes annunciator does not alarm due to no LOCA signal present.		
	EVALUATOR CUE If asked about LOCA Isolation Manual Override not sealing in, Role Play as Unit Supervisor and ask candidate for a recommendation on how to proceed and direct them to follow their recommendation.			

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 35.ON.1662.101 Student Name: ______

Step	Action	Standard	Eval	Comments
*6.	Close the following valves:			
	• HV-151F048A-RHR Hx A Shell Side Bypass Vlv.*	Closes HV-151F048A by rotating control switch counterclockwise to CLOSE.*		
	• HV-151F017A-RHR Loop A Injection Flow Control Vlv.	Closes HV-151F017A by rotating control switch counterclockwise to CLOSE and holding until red light is off **(NOT CRITICAL)**.		
	• HV-151F003A-RHR Hx A Shell Side Outlet Vlv.*	Closes HV-151F003A by rotating control switch counterclockwise to CLOSE and holding until red light is off.*		
7.	Ensure the following valves CLOSED:			
	• HV-151F016A RHR Loop A Drwl Spray OB Iso Vlv.	Observes HV-151F016A amber light on, red light off.		
	• HV-151F028A RHR Loop A Supp Cbr Spray Test Shutoff Vlv.	Observes HV-151F028A amber light on, red light off.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 35.ON.1662.101 Student Name: ______________________

Step	Action	Standard	Eval	Comments
*8.	Open the following valves: • 151070 RHR to Refuel Pool Clg and Clnup Return (Rm I 202 'B' RHR Pipeway 28 683' Act 708')* • 153070A Fuel Pool Fill Vlv from RHR (Rm I 514 Fuel Pool Pump and Hx Room 29 749' Act 753') • 153070B Fuel Pool Fill Vlv from RHR (Rm I 514 Fuel Pool Pump and Hx Room 29 749' Act 753.5') **EVALUATOR NOTE** Only opening 151070 is critical in this step. **BOOTH OPERATOR CUE** Press **{Key[22]}** to open manual valve 151070. (Found on **P&ID RH1**) Valves 153070A/B are already open. (Found on **P&ID FP1**) **BOOTH OPERATOR CUE** Role Play as In-Plant Operator and report the valves are Open.	Dispatches NPO to open 151070*, 153070A, and 153070B.		
9.	IF necessary, Momentarily Place HS-11202A3 RHRSW Pump A Loca Trip to RESET.	Determines NOT necessary to place HS-11202A3 to RESET.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 35.ON.1662.101 Student Name:

Step	Action	Standard	Eval	Comments
*10.	Start 1(2)P506A RHRSW Pump A.	Starts1P506A by rotating control switch clockwise to START.		
*11.	Open HV112F073A RHRSW Crosstie.	Opens HV-112-F073A by rotating control switch clockwise to OPEN.		
*12.	Open HV112F075A RHRSW Crosstie.	Opens HV-112-F075A by rotating control switch clockwise to OPEN.		
13.	Ensure HV-112F074A RHRSW/RHR LOOP A CROSSTIE DRAIN VLV CLOSES. (Rm I 104 29 645' Act 671') **EVALUATOR CUE** As In-Plant operator, when asked about valve HV-112F074A, report valve is closed. **EVALUATOR CUE** This completes the JPM. **EVALUATOR** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	Dispatches NPO to determine HV-112-F074A position.		

* = Critical Step
\# = Critical Sequence

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
S/RO 35.ON.1662.101

- Insert the following malfunctions:
    IMF annAR016G06 f:ALARM_ON
    IMF annAR016H14 f:ALARM_ON
    IMF annAR016H16 f:ALARM_ON
    IMF annAR106A17 f:ALARM_ON
- Insert the following remote function:
    IRF rfFP135007 f:RHR_BACKUP
- Insert the following over-ride:
    IOR aoLRTR15347A f:815.92
- This JPM uses the following Event Trigger:
    aet n13jpmBet1
        Which consists of conditions:
        diHS11275A.CurrValue = #OR.diHS11275A.OPEN
        And linked commands:
        MOR aoLRTR15347A i:AsIs f:816 r:3:00
- Assign the following Keys:
    {Key[21]} MOR aoLRTR15347A r:30:00 i:AsIs f:815.75
    {Key[22]} IRF rfRH149026 f:100
- Place the simulator in Freeze.
- Consider snapping an IC for multiple performances of this JPM.
- When student is ready to begin **JPM**, place the simulator in **RUN**.
- Press **{Key[21]}** to begin lowering the level in the fuel pool.

RO Handout

TASK CONDITIONS

A. A Seismic event has occurred.

B. Unit 1 is in Mode 1.

C. Unit 1 Fuel Pool inventory is lowering due to a system breach.

D. Normal Fuel Pool makeup is unavailable.

E. A system walkdown was unable to locate the leak, however the rate of inventory loss is not severe.

F. The Unit 1 Fuel Pool Cooling System has been shutdown.

G. The Cask Storage Pit Gate is closed.

H. The Unit 1 Fuel Pool has been isolated from Non-Q piping by another operator.

I. Adding water to the fuel pool was attempted using ESW and Fire Protection, but was unsuccessful.

J. Current Unit 1 Pool level is 21' 11" down slow.

INITIATING CUE

Add water to the Unit 1 Fuel Pool via RHRSW through RHR Loop 'A' IAW ON-135-001 section 3.6.7.e.

RO Handout

TASK CONDITIONS

A. A Seismic event has occurred.

B. Unit 1 is in Mode 1.

C. Unit 1 Fuel Pool inventory is lowering due to a system breach.

D. Normal Fuel Pool makeup is unavailable.

E. A system walkdown was unable to locate the leak, however the rate of inventory loss is not severe.

F. The Unit 1 Fuel Pool Cooling System has been shutdown.

G. The Cask Storage Pit Gate is closed.

H. The Unit 1 Fuel Pool has been isolated from Non-Q piping by another operator.

I. Adding water to the fuel pool was attempted using ESW and Fire Protection, but was unsuccessful.

J. Current Unit 1 Pool level is 21' 11" down slow.

INITIATING CUE

Add water to the Unit 1 Fuel Pool via RHRSW through RHR Loop 'A' IAW ON-135-001 section 3.6.7.e.

SRO Handout

TASK CONDITIONS

A. A Seismic event has occurred.

B. Unit 1 is in Mode 1.

C. Unit 1 Fuel Pool inventory is lowering due to a system breach.

D. Normal Fuel Pool makeup is unavailable.

E. A system walkdown was unable to locate the leak, however the rate of inventory loss is not severe.

F. The Unit 1 Fuel Pool Cooling System has been shutdown.

G. The Cask Storage Pit Gate is closed.

H. The Unit 1 Fuel Pool has been isolated from Non-Q piping by another operator.

I. Adding water to the fuel pool was attempted using ESW and Fire Protection, but was unsuccessful.

J. Current Unit 1 Pool level is 21' 11" down slow.

INITIATING CUE

Add water to the Unit 1 Fuel Pool via RHRSW through RHR Loop 'A'.

SRO Handout

TASK CONDITIONS

A. A Seismic event has occurred.

B. Unit 1 is in Mode 1.

C. Unit 1 Fuel Pool inventory is lowering due to a system breach.

D. Normal Fuel Pool makeup is unavailable.

E. A system walkdown was unable to locate the leak, however the rate of inventory loss is not severe.

F. The Unit 1 Fuel Pool Cooling System has been shutdown.

G. The Cask Storage Pit Gate is closed.

H. The Unit 1 Fuel Pool has been isolated from Non-Q piping by another operator.

I. Adding water to the fuel pool was attempted using ESW and Fire Protection, but was unsuccessful.

J. Current Unit 1 Pool level is 21' 11" down slow.

INITIATING CUE

Add water to the Unit 1 Fuel Pool via RHRSW through RHR Loop 'A'.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Swap Core Spray Loops

S/RO	51.OP.1934.101	0	03/27/2013	Simulator
Appl To	JPM Number	Revision	Date	Setting

209001	A4.01	3.8/3.6	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/27/2013	15
Author	Date	Validation Time (min)

Validated / Approval

RC Th	3/28/2013	[signature]	4/8/13
Operations Instructor	Date	Nuclear Trng Supv R. Strawyer	Date

Examinee Name: ______________________ ______________

Last, First MI — Employee Number

Exam Date: ____________ Exam Duration (Min) ____________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator

______________________ ______________________

Name — Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 51.OP.1934.101

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-151-001, CORE SPRAY SYSTEM, REV 34

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. A loss of coolant accident occurred 24 hours ago.

B. EO-000-112, Rapid Depressurization, has been performed.

C. Reactor water level is being controlled +13" to +54" using Core Spray loop A.

D. Core Spray loop B has previously been shutdown per OP-151-001 section 2.7.3.

E. No other high capacity injection systems are available.

F. It is desired to swap from Core Spray loop A to loop B.

G. It is desired to end up with a single loop B pump running and both loop A pumps shutdown.

V. INITIATING CUE

Start Core Spray loop B per OP-151-001 section 2.7.5.b. Secure Core Spray loop A per OP-151-001 section 2.7.3.b. Control Reactor water level +13" to +54".

VI. TASK STANDARD

Core Spray loop B injecting to the Reactor. Core Spray loop A secured. Reactor water level controlled above -161".

VII. TASK SAFETY SIGNIFICANCE

Maintaining Reactor water inventory will prevent fuel element overheating and cladding damage.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 51.OP.1934.101 Student Name: ______

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE • This JPM must be performed in the simulator. • Reset the simulator to IC–382. • Ensure the simulator is setup in accordance with the attached Simulator Setup Instructions. • Prior to performing this JPM, obtain a copy of the latest revision of OP-151-001. Mark up step 2.7.3.a and provide it to the student along with the Task Conditions/Initiating Cue Sheet.			
1.	Obtain a controlled copy of OP-151-001, Core Spray System.	Obtains Controlled copy from evaluator.		
2.	Review Section 2.7.	Reviews Section 2.7.		
	EVALUATOR CUE If asked about how many pumps to start in Core Spray Loop B, direct the candidate to start one pump.			
3.	Close CORE SPRAY LOOP B IB INJ SHUTOFF HV 152F005B.	Observes CORE SPRAY LOOP B IB INJ SHUTOFF HV 152F005B closed by amber light on, red light off.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 51.OP.1934.101 Student Name:

Step	Action	Standard	Eval	Comments
*4.	Start Core Spray Pump 1P206B and/or D.	Starts Core Spray Pump 1P206B by rotating control switch clockwise to START. and/or Starts Core Spray Pump 1P206D by rotating control switch clockwise to START.		
*5.	Throttle Open CORE SPRAY LOOP B IB INJ SHUTOFF HV-152F005B to establish loop flow ≤ 90 amps and ≤ 3950 gpm for single pump operation OR ≤ 90 amps and ≤ 7900 gpm for two pump operation. **EVALUATOR NOTE** Throttling of injection valve may not be done until after the other loop of Core Spray is being taken out of service.	Throttles open HV-152-F005B by rotating control switch clockwise to OPEN.		
6.	WHEN flow to reactor vessel ≥ 635 gpm, Ensure CORE SPRAY LOOP B MIN FLOW HV-152F031B CLOSES.	If Core Spray loop flow rises to 635 gpm, observes HV-152F031B amber light on, red light off.		
7.	Check Core Spray Room Unit Coolers 1V211B and/or D AUTO STARTS indicated on Heating and Ventilation Panel 1C681.	Observes 1V211B and/or D red light on, amber light off.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 51.OP.1934.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
8.	May throttle CORE SPRAY LOOP A INJ SHUTOFF HV-152F005A.	Closes / throttles closed HV-152-F005A by rotating control switch counterclockwise to CLOSE.		
*9.	Place Core Spray pump A and C control switches to STOP and Release.	Stops Core Spray pump A by rotating control switch counterclockwise to STOP. Stops Core Spray pump C by rotating control switch counterclockwise to STOP.		
10.	Observe white pump override lights ILLUMINATED.	Observes Core Spray pump A white light on. Observes Core Spray pump C white light on.		
11.	Observe no Core Spray pump running (in loop).	Observes Core Spray pump A amber light on, red light off. Observes Core Spray pump C amber light on, red light off.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 51.OP.1934.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
*12.	Throttle CORE SPRAY LOOP B IB INJ SHUTOFF HV-152F005B to control Reactor water level above -161". **EVALUATOR ROLE PLAY** If Reactor water level drops below +13" and candidate requests new/wider Reactor water level band, direct Reactor water level controlled -129" to +54". **EVALUATOR CUE** This completes the JPM. **EVALUATOR** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	Throttles HV-152-F005B by rotating control switch as necessary to maintain Reactor water level above -161".		

* = Critical Step
# = Critical Sequence

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
S/RO 51.OP.1934.101

- Insert the following malfunctions to initiate a LOCA and fail all high-capacity injection sources other than Core Spray:

  IMF mfRR164011A f:2
  IMF mfRH149007A
  IMF mfRH149007C
  IMF mfRH149007B
  IMF mfRH149007D
  IMF mfRC150007
  IMF mfHP152011
  IMF mfFW144003D
  IMF mfFW144003C
  IMF mfFW144003B
  IMF mfFW144003A

- Place the Mode Switch in SHUTDOWN.
- Place all ADS valve control switches to OPEN.
- Place the simulator in RUN.
- Secure Core Spray loop B per OP-151-001 section 2.7.3.b (shutdown both pumps and close inboard injection valve).
- Throttle Core Spray loop A inboard injection valve as necessary to maintain Reactor water level +13" to +54".
- Allow plant conditions to stabilize.
- Place the simulator in Freeze.
- Consider snapping an IC for multiple performances of this JPM.
- When student is ready to begin **JPM**, place the simulator in **RUN**.

TASK CONDITIONS

A. A loss of coolant accident occurred 24 hours ago.

B. EO-000-112, Rapid Depressurization, has been performed.

C. Reactor water level is being controlled +13" to +54" using Core Spray loop A.

D. Core Spray loop B has previously been shutdown per OP-151-001 section 2.7.3.

E. No other high capacity injection systems are available.

F. It is desired to swap from Core Spray loop A to loop B.

G. It is desired to end up with a single loop B pump running and both loop A pumps shutdown.

INITIATING CUE

Start Core Spray loop B per OP-151-001 section 2.7.5.b. Secure Core Spray loop A per OP-151-001 section 2.7.3.b. Control Reactor water level +13" to +54".

TASK CONDITIONS

A. A loss of coolant accident occurred 24 hours ago.

B. EO-000-112, Rapid Depressurization, has been performed.

C. Reactor water level is being controlled +13" to +54" using Core Spray loop A.

D. Core Spray loop B has previously been shutdown per OP-151-001 section 2.7.3.

E. No other high capacity injection systems are available.

F. It is desired to swap from Core Spray loop A to loop B.

G. It is desired to end up with a single loop B pump running and both loop A pumps shutdown.

INITIATING CUE

Start Core Spray loop B per OP-151-001 section 2.7.5.b. Secure Core Spray loop A per OP-151-001 section 2.7.3.b. Control Reactor water level +13" to +54".

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Reset Recirculation Pump Runback, Pump Speed Oscillates

S/RO	64.OP.004.155	0	12/5/2012	Simulator
Appl To	JPM Number	Revision	Date	Setting

202002	A4.07	3.3/3.2	Y	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	12/5/2012	20
Author	Date	Validation Time (min)

Validated / Approval

[signature]	3/28/2013	[signature]	4/8/13
Operations Instructor	Date	Nuclear Trng Supv R. Strong	Date

Examinee Name: ______________________ ______________________

Last, First MI / Employee Number

Exam Date: ______________ Exam Duration (Min) ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________

Name / Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 64.OP.004.155

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. ON-164-002, LOSS OF REACTOR RECIRCULATION FLOW, REV 36

III. OPERATIONAL ACTIVITIES

036 Reset Recirc Pump Runback

IV. TASK CONDITIONS

A. The plant is in Mode 1.

B. A trip of Circulating Water pump 1D has caused a Reactor Recirculation runback to occur.

C. ON-164-002, Loss of Reactor Recirculation Flow, has been executed up to step 4.4.14.

V. INITIATING CUE

Reset the Recirculation pump A runback in accordance with ON-164-002, starting at step 4.4.14.

VI. TASK STANDARD

Recirc pump limiter #2 reset for Recirculation pumps A. Scoop tube locked for Recirculation pump A.

VII. TASK SAFETY SIGNIFICANCE

Inability to reset limiter would prevent control of Recirculation pump speed.

Failure to recognize a speed control malfunction for a Recirculation pump would allow a power excursion.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 64.OP.004.155 Student Name: ____________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE • This JPM must be performed in the simulator. • Reset the simulator to IC–383. • Setup the simulator in accordance with the attached Simulator Setup Instructions. • Prior to performing this JPM, obtain a copy of the latest revision of ON-164-002. Markup the procedure to step 4.4.14.			
1.	Obtain a controlled copy of ON-164-002, Loss of Reactor Recirculation Flow.	Obtains Controlled copy from evaluator.		
2.	Determine signal that initiated runback from following: • For a Limiter #2, Touch the LIM 2 STATUS button on the bottom of the screen.	Touches the LIM 2 STATUS button on the HMI screen.		
3.	On the corresponding overlay screen, the condition which caused the Limiter #2 Initiation will have a red background (assuming the associated input is Enabled) • Any Circulating Water Pump protective trip.	Observes red background for CWP TRIPS.		

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 64.OP.004.155 Student Name: ____________

Step	Action	Standard	Eval	Comments
4.	As required, Touch the DEFAULT TO MANUAL MODE button for the applicable Rx Recirc Pump A(B) controller(s).	Determines step not required.		
5.	Ensure the MANUAL MODE SELECTED button is backlit yellow on the Rx Recirc Pump A(B) Manual Mode HMI screen. **EVALUATOR ROLE PLAY** If asked about Recirc pump critical speeds, report that another operator is monitoring Recirc pump speed for critical speeds.	Observes the MANUAL MODE SELECTED button is backlit yellow on the Rx Recirc Pump A(B) Manual Mode HMI screen.		
6.	IF resetting a Limiter #1 Runback on the 'A' RRP, Ensure positive control of Recirc Pump by performing the following on RRP_A HMI screen:	Determines step not applicable.		
7.	IF resetting a #1 Limiter on the 'B' RRP, Ensure positive control of Recirc Pump by performing the following on RRP_B HMI screen.	Determines step not applicable.		
8.	For Limiter #2 runback Perform following for one or both pumps as required: • Perform a Critical Brief. **EVALUATOR CUE** Inform the candidate that a Critical Brief has been completed for the upcoming evolution.	Informs evaluator of need for Critical Brief.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 64.OP.004.155 Student Name:

Step	Action	Standard	Eval	Comments
9.	For Reactor Feed Pump(s) NOT feeding the vessel, Perform the following:	Determines all three Reactor Feed pumps are feeding the vessel and the step is not applicable.		
10.	For Reactor Feed Pump(s) feeding the vessel, with < 16.4% (~ 0.9 Mlbm/hr) flow, Perform the following:	Determines all three Reactor Feed pump flows are > 16.4% and the step is not applicable.		
11.	For Reactor Feed Pump(s) feeding the vessel with > 16.4% (~ 0.9 Mlbm/hr) flow, Perform the following: On the RRP_A(B) HMI screen, Ensure RFP A(B)(C) IND FLOW < 16.4% Input to RX RECIRC RUNBK CKT are ENABLED, by observing the appropriate RFP status block is not backlit orange. IF required, ENABLE RFP A(B)(C) IND FLOW < 16.4% Input to RX RECIRC RUNBK CKT in accordance with OP-164-001.	Observes all three RFP status blocks not backlit orange on RRP_A(B) HMI screen(s).		
12.	IF resetting a # 2 Limiter on 'A' RRP, Ensure positive control of the Recirc pump by performing the following on the RRP_A HMI screen: Verify the SY-B31-1R621A % Controller Output signal has tracked Limiter Signal and is ~ 27.10%.	Observes SY-B31-1R621A indicates ~27.10%.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 64.OP.004.155 Student Name: ______

Step	Action	Standard	Eval	Comments
*13.	Touch a REACTOR RECIRC PUMP A SPEED SY-B31-1R621A Controller DEC button as necessary to lower speed AND	Touches a REACTOR RECIRC PUMP A SPEED SY-B31-1R621A Controller DEC button.		
14.	Observe a change in ALL of the following:			
	Decrease in GEN 1A Speed on SI-14032A or TRA036 AND	Observes GEN 1A Speed on SI-14032A or TRA036 lowers.		
	Decrease in Gen 1A Demand on XI-14032A, AND	Observes Gen 1A Demand on XI-14032A lowers.		
	Decrease in Scoop Tube 1A Position, TRA044, AND	Observes Scoop Tube 1A Position lowers.		
	Decrease in Loop 1A Drive Flow NRF01	Observes Loop 1A Drive Flow lowers.		
15.	Observe the HS-B31-1S12A Rx RECIRC LIMITER #2 (48%) RUNBACK RESET button is active (blue background).	Observes the HS-B31-1S12A Rx RECIRC LIMITER #2 (48%) RUNBACK RESET button is active (blue background).		
16.	Wait for at least one minute, for the Scoop Tube Positioner to make its final (0.111%) position adjustment, prior to continuing. **EVALUATOR CUE** One minute has passed.	Waits before proceeding to next step.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 64.OP.004.155 Student Name:

Step	Action	Standard	Eval	Comments
*17.	Touch HS-B31-1S12A Rx RECIRC LIMITER #2 (48%) RUNBACK RESET button.	Touches HS-B31-1S12A Rx RECIRC LIMITER #2 (48%) RUNBACK RESET button.		
*18.	Touch the RESET LIMITER # 2 button on the confirmation overlay screen, AND	Touches the RESET LIMITER # 2 button on the confirmation overlay screen.		
FAULT STATEMENT Recirculation pump A speed will begin to oscillate when the candidate resets Limiter #2. This will require the candidate to lock the scoop tube.				
19.	Monitor GEN 1A SPEED SI-14032A on RRP_A HMI screen.	Observes GEN 1A SPEED SI-14032A on RRP_A HMI screen rises and then oscillates.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 64.OP.004.155 Student Name: ______________________

Step	Action	Standard	Eval	Comments
*20.	IF speed increases rapidly, Trip Scoop Tube on affected generator by Depressing SCOOP TUBE A LOCK OR RESET HS-B31-1S03A TRIP pushbutton or Trip the affected pump. **EVALUATOR NOTE** Recirculation pump A speed will initially rise, and then oscillate. If the initial rise does not trigger the candidate to lock the scoop tube at this step, alternate guidance to lock the scoop tube can be found in ON-156-001, Unanticipated Reactivity Change, Immediate Action 3.2. The immediate action also allows tripping the Recirculation pump. **EVALUATOR CUE** This completes the JPM. **EVALUATOR** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	Locks RRP A scoop tube by depressing SCOOP TUBE A LOCK OR RESET HS-B31-1S03A TRIP Or Trips Recirculation pump A by depressing MG SET A DRV MTR BRK HS-14001A STOP pushbutton.		

* = Critical Step
\# = Critical Sequence

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
S/RO 64.OP.004.155

- Ensure the following are loaded to trip Circulating Water pump D, initiate a Lim #2 runback, and oscillate Recirculation pump A speed (n13jpmD.scn may be used to accomplish this):
  IMF cmfPM03_1P501D
  aet n13jpmDet1

- Ensure n13jpmDet1.et is available with the following condition:
  ;Recirc A oscillation after resetting LIM 2 runback
  fx1A_LIMITERS_B420.BI03=1

- Ensure n13jpmDet1.scn is available with the following commands:
  SCN n13jpmD_1

- Ensure n13jpmD_1.scn is available with the following commands:
  +3 set fx1RRPA_1RRPASTD.OUT=27.7
  +3 set fx1RRPA_1RRPASTD.OUT=28.7
  +3 set fx1RRPA_1RRPASTD.OUT=29.4
  +3 set fx1RRPA_1RRPASTD.OUT=29.9
  +3 set fx1RRPA_1RRPASTD.OUT=30.2
  +3 set fx1RRPA_1RRPASTD.OUT=29.9
  +3 set fx1RRPA_1RRPASTD.OUT=29.4
  +3 set fx1RRPA_1RRPASTD.OUT=28.7
  +3 set fx1RRPA_1RRPASTD.OUT=27.7
  +3 set fx1RRPA_1RRPASTD.OUT=26.7
  +3 set fx1RRPA_1RRPASTD.OUT=26.0
  +3 set fx1RRPA_1RRPASTD.OUT=25.5
  +3 set fx1RRPA_1RRPASTD.OUT=25.2
  +3 set fx1RRPA_1RRPASTD.OUT=25.5
  +3 set fx1RRPA_1RRPASTD.OUT=26.0
  SCN n13jpmD_2

- Ensure n13jpmD_2.scn is available with the following commands:
  ABORT n13jpmD_1
  SCN n13jpmD_1

- Place the simulator in RUN.
- Allow plant conditions to stabilize.
- Perform actions of ON-164-002 through step 4.4.13.
- Load monitored parameter rrn1p401a.
- Place the simulator in Freeze.
- Consider snapping an IC for multiple performances of this JPM.
- When student is ready to begin **JPM**, place the simulator in **RUN**.

TASK CONDITIONS

A. The plant is in Mode 1.

B. A trip of Circulating Water pump 1D has caused a Reactor Recirculation runback to occur.

C. ON-164-002, Loss of Reactor Recirculation Flow, has been executed up to step 4.4.14.

INITIATING CUE

Reset the Recirculation pump A runback in accordance with ON-164-002, starting at step 4.4.14.

TASK CONDITIONS

A. The plant is in Mode 1.

B. A trip of Circulating Water pump 1D has caused a Reactor Recirculation runback to occur.

C. ON-164-002, Loss of Reactor Recirculation Flow, has been executed up to step 4.4.14.

INITIATING CUE

Reset the Recirculation pump A runback in accordance with ON-164-002, starting at step 4.4.14.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Main Steam Line Isolation and Quick Recovery in accordance with ON-184-001

S/RO	84.ON.003.101	4	03/27/2013	Simulator
Appl To	JPM Number	Revision	Date	Setting

239001	A4.01	4.2/4.0	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/27/2013	30
Author	Date	Validation Time (min)

Validated / Approval

R. [signature]	3/28/2013	[signature]	4/8/13
Operations Instructor	Date	Nuclear Trng Supv R. [signature]	Date

---

Examinee Name: ______________________ ______________________

Last, First MI — Employee Number

Exam Date: __________ Exam Duration (Min) __________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________

Name — Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 84.ON.003.101

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. ON-184-001, MAIN STEAM LINE ISOLATION AND QUICK RECOVERY, REV 16

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. An MSIV isolation and Reactor scram occurred from 100% reactor power.
B. The cause of the MSIV isolation was a faulty isolation logic surveillance test procedure.
C. RCIC injection is controlling Reactor water level.
D. Reactor pressure is controlled by manual SRV actuation.
E. Restoration of normal steam loads and turbine bypass system is required for a reactor cooldown.

V. INITIATING CUE

Perform a quick recovery from a Main Steam Line Isolation and reopen the MSIVs per ON-184-001.

VI. TASK STANDARD

MSIVs open.

VII. TASK SAFETY SIGNIFICANCE

Inability to reopen the MSIVs would eliminate a heat sink requiring additional unnecessary energy to be added to the Primary Containment.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 84.ON.003.101 Student Name: ______

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE • This JPM must be performed in the simulator. • Reset the simulator to IC–384. • Setup the simulator in accordance with the attached Simulator Setup Instructions. • Prior to performing this JPM, obtain a copy of the latest revision of ON-184-001 and provide to candidate. • There are separate cue sheets for RO and SRO candidates. Provided RO candidates with only the RO cue sheet. Provide SRO candidates with only the SRO cue sheet. **BOOTH OPERATOR NOTE** Control RCIC injection rate as needed to maintain Reactor water level.			
1.	Obtain a controlled copy of ON-184-001, Main Steam Line Isolation and Quick Recovery.	Obtains Controlled copy from evaluator.		

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 84.ON.003.101 Student Name: ______________

Step	Action	Standard	Eval	Comments
*2.	Place control switches for following to CLOSE: • Mn Stm Line A IB Iso HV-141-F022A • Mn Stm Line B IB Iso HV-141-F022B • Mn Stm Line C IB Iso HV-141-F022C • Mn Stm Line D IB Iso HV-141-F022D • Mn Stm Line A OB Iso HV-141-F028A • Mn Stm Line B OB Iso HV-141-F028B • Mn Stm Line C OB Iso HV-141-F028C • Mn Stm Line D OB Iso HV-141-F028D	Rotates the following control switches counterclockwise to CLOSE (Panel 1C601): • Mn Stm Line A IB Iso HV-141-F022A • Mn Stm Line B IB Iso HV-141-F022B • Mn Stm Line C IB Iso HV-141-F022C • Mn Stm Line D IB Iso HV-141-F022D • Mn Stm Line A OB Iso HV-141-F028A • Mn Stm Line B OB Iso HV-141-F028B • Mn Stm Line C OB Iso HV-141-F028C • Mn Stm Line D OB Iso HV-141-F028D		
3.	Ensure Mn Stm Line IB Drain HV-141-F016 CLOSED.	Observes HV-141-F016 amber light on, red light off (Panel 1C601).		
4.	Ensure Mn Stm Line OB Drain HV-141-F019 CLOSED.	Observes HV-141-F019 amber light on, red light off (Panel 1C601).		
5.	Ensure Mn Stm Line Drain to Cdsr HV-141-F021 CLOSED.	Observes HV-141-F021 amber light on, red light off (Panel 1C601).		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 84.ON.003.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
6.	Ensure following TRIPPED: • Main Turbine • Reactor Feed Pump Turbine A • Reactor Feed Pump Turbine B • Reactor Feed Pump Turbine C	Observes Main Turbine stop valves indicate closed and/or trip annunciator (Panel 1C651). Observes Reactor Feed pumps A, B, and C tripped on HMI screen and/or trip annunciators AR-101-001 (A10, A12, A14) (Panel 1C651).		
7.	IF isolation due to EHC System malfunction:	Determines step not applicable.		
8.	Close following by Depressing Drip Leg Drn HS-10112 AUTO pushbutton: • Drip Leg Drn HV-10112A1. • Drip Leg Drn HV-10112B1. • Drip Leg Drn HV-10112C1. • Drip Leg Drn HV-10112D1.	Observes the following valves closed by amber light on, red light off (Panel 1C668): • Drip Leg Drn HV-10112A1. • Drip Leg Drn HV-10112B1. • Drip Leg Drn HV-10112C1. • Drip Leg Drn HV-10112D1.		
9.	Close BPV Hdr Drip Leg Drn Byps HV-10108A by Depressing HS-10108A AUTO pushbutton. **EVALUATOR NOTE** The candidate may depress the CLOSE pushbutton due to the wording of the procedure step, even though the valve is already closed.	Observes closed HV-10108A by amber light on, red light off (Panel 1C668).		

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 84.ON.003.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
10.	Close MSV Bst Drn HV-10101 A,B,C,D by Depressing common CLOSE pushbutton. **EVALUATOR NOTE** The candidate may depress the CLOSE pushbutton due to the wording of the procedure step, even though the valve is already closed.	Observes HV-10101 A,B,C,D closed by amber light on, red light off (Panel 1C668).		
11.	Close SSE Mn Stm Sup CV HV-10703.	Closes HV-10703 by depressing CLOSE pushbutton (Panel 1C668).		
12.	Ensure SSE Mn Stm Sup Ln Drn HV-10767 CLOSED.	Observes HV-10767 amber light on, red light off (Panel 1C668).		
13.	Ensure SSE Mn Stm Sup Ln Drn HV-10768 CLOSED.	Observes HV-10768 amber light on, red light off (Panel 1C668).		
*14.	Close SSE Press Ctlr Iso HV-10704, AND	Closes HV-10704 by depressing CLOSE pushbutton (Panel 1C668).		

* = Critical Step
# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 84.ON.003.101 Student Name: ____________________

Step	Action	Standard	Eval	Comments
15.	Throttle OPEN SSE Press Ctlr Byps HV-10705 to establish 0.25 to 0.50 psig on SSE Pressure PI-10723. **EVALUATOR NOTE** Pressure will not rise in this step because the Main Steam Line is depressurized. If the candidate anticipates this response, they may N/A this step. **EVALUATOR CUE** If asked how to proceed based on pressure not rising, direct candidate to respond in accordance with the procedure.	Throttles open HV-10705 by depressing OPEN pushbutton (Panel 1C668). Observes PI-10723 does NOT rise (Panel 1C668).		
16.	IF pressure was not established in the preceding step, Close HV-10705 SSE Press Ctlr Byps vlv.	Closes HV-10705 by depressing CLOSE pushbutton (Panel 1C668).		
*17.	Close Mn Stm SJAE Iso HV-10107.	Closes HV-10107 by depressing CLOSE pushbutton (Panel 1C668).		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 84.ON.003.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
*18.	WHEN directed by Shift Supervision AND initiating event is determined and cleared, Reset NSSSS Main Steam Line Isolation by Depressing: • Mn Stm Line Div 1 Iso Reset HS-B21-1S32 Reset pushbutton. • Mn Stm Line Div 2 Iso Reset HS-B21-1S33 Reset pushbutton. **EVALUATOR CUE** If asked, direct candidate to continue with procedure.	Depresses HS-B21-1S32 Reset pushbutton (Panel 1C601). Depresses HS-B21-1S33 Reset pushbutton (Panel 1C601).		
*19.	To Open IB MSIVs Place following control switches to AUTO: • Mn Stm Line A IB Iso HV-141-F022A. • Mn Stm Line B IB Iso HV-141-F022B. • Mn Stm Line C IB Iso HV-141-F022C. • Mn Stm Line D IB Iso HV-141-F022D.	Opens inboard MSIVs by rotating the following control switches clockwise to AUTO (Panel 1C601): • Mn Stm Line A IB Iso HV-141-F022A. • Mn Stm Line B IB Iso HV-141-F022B. • Mn Stm Line C IB Iso HV-141-F022C. • Mn Stm Line D IB Iso HV-141-F022D.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 84.ON.003.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
20.	Align for steam line pressurization as follows: Enter TRO 3.8.2.1 **EVALUATOR ROLE PLAY** Acknowledge report and inform candidate that you have entered TRO 3.8.2.1.	Informs evaluator to enter TRO 3.8.2.1.		
21.	Place AC MOV OL Byps HS-B21-1S37A to TEST.	Rotates HS-B21-1S37A clockwise to TEST (Panel 1C601).		
22.	Place DC MOV OL Byps HS-B21-1S37B to TEST.	Rotates HS-B21-1S37B clockwise to TEST (Panel 1C601).		
*23.	Open Mn Stm Line IB Drain HV-141-F016.	Opens HV-141-F016 by rotating control switch clockwise to OPEN (Panel 1C601).		
*24.	Open Mn Stm Line OB Drain HV-141-F019.	Opens HV-141-F019 by rotating control switch clockwise to OPEN (Panel 1C601).		
25.	Ensure Mn Steam Line Warm Up HV-141-F020 OPEN.	Observes HV-141-F020 red light on, amber light off (Panel 1C601).		

* = Critical Step
# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO   JPM No.: 84.ON.003.101   Student Name: ____________

Step	Action	Standard	Eval	Comments
26.	AFTER 2 minutes: **EVALUATOR CUE** 2 minutes have passed.	Waits before proceeding to next step.		
27.	Place AC MOV OL Byps HS-B21-1S37A to NORM.	Rotates HS-B21-1S37A counterclockwise to NORM (Panel 1C601).		
28.	Place DC MOV OL Byps HS-B21-1S37B to NORM.	Rotates HS-B21-1S37B counterclockwise to NORM (Panel 1C601).		
29.	Exit TRO 3.8.2.1 **EVALUATOR ROLE PLAY** Acknowledge report and inform candidate that you have exited TRO 3.8.2.1.	Informs evaluator to exit TRO 3.8.2.1.		
30.	Observe main steam line pressure RISING on Main Turbine Generator Recorder XR-19201.	Observes main steam line pressure RISING on Main Turbine Generator Recorder XR-19201 (Panel 1C668).		

* = Critical Step
# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 84.ON.003.101 Student Name: ______________________

Step	Action	Standard	Eval	Comments
31.	WHEN differential pressure across MSIVs is between 50 psid and 200 psid, **EVALUATOR CUE** Once candidate displays ability to determine differential pressure across MSIVs and D/P is less than 400 psig, inform the candidate that the dP requirements have been met and the MSIVs may be opened.	Compares difference between main steam line pressure and Reactor pressure.		
*32.	Open OB MSIVs by Placing following control switches to AUTO: • Mn Stm Line A OB Iso HV-141-F028A • Mn Stm Line B OB Iso HV-141-F028B • Mn Stm Line C OB Iso HV-141-F028C • Mn Stm Line D OB Iso HV-141-F028D **EVALUATOR CUE** This completes the JPM. **EVALUATOR** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	Opens outboard MSIVs by rotating the following control switches clockwise to AUTO (Panel 1C601). • Mn Stm Line A OB Iso HV-141-F028A • Mn Stm Line B OB Iso HV-141-F028B • Mn Stm Line C OB Iso HV-141-F028C • Mn Stm Line D OB Iso HV-141-F028D		

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
S/RO 84.ON.003.101

- From a power operating IC, insert the following to cause a spurious MSIV isolation on high steam line flow (n13jpmE.scn may be used to accomplish this):

  IMF cmfRL01_B211K3A
  IMF cmfRL01_B211K3D

- Insert the following malfunctions as need to assist in stabilizing Reactor pressure - cmfRV04_PSV141F13A(B)(C)(D) f:8
- Place the Mode Switch in SHUTDOWN.
- Place the simulator in RUN.
- Take action to stabilize Reactor water level and pressure. Establish level control with RCIC and pressure control with SRVs.
- Allow plant conditions to stabilize.
- Delete the malfunctions listed above to allow re-opening MSIVs.
- Place the simulator in Freeze.
- Consider snapping an IC for multiple performances of this JPM.
- When student is ready to begin **JPM**, place the simulator in **RUN**.

RO Handout

TASK CONDITIONS

A. An MSIV isolation and Reactor scram occurred from 100% reactor power.
B. The cause of the MSIV isolation was a faulty isolation logic surveillance test procedure.
C. RCIC injection is controlling Reactor water level.
D. Reactor pressure is controlled by manual SRV actuation.
E. Restoration of normal steam loads and turbine bypass system is required for a reactor cooldown.

INITIATING CUE

Perform a quick recovery from a Main Steam Line Isolation and reopen the MSIVs per ON-184-001.

RO Handout

TASK CONDITIONS

A. An MSIV isolation and Reactor scram occurred from 100% reactor power.
B. The cause of the MSIV isolation was a faulty isolation logic surveillance test procedure.
C. RCIC injection is controlling Reactor water level.
D. Reactor pressure is controlled by manual SRV actuation.
E. Restoration of normal steam loads and turbine bypass system is required for a reactor cooldown.

INITIATING CUE

Perform a quick recovery from a Main Steam Line Isolation and reopen the MSIVs per ON-184-001.

SRO Handout

TASK CONDITIONS

A. An MSIV isolation and Reactor scram occurred from 100% reactor power.
B. The cause of the MSIV isolation was a faulty isolation logic surveillance test procedure.
C. RCIC injection is controlling Reactor water level.
D. Reactor pressure is controlled by manual SRV actuation.
E. Restoration of normal steam loads and turbine bypass system is required for a reactor cooldown.

INITIATING CUE

Perform a quick recovery from a Main Steam Line Isolation and reopen the MSIVs.

SRO Handout

TASK CONDITIONS

A. An MSIV isolation and Reactor scram occurred from 100% reactor power.
B. The cause of the MSIV isolation was a faulty isolation logic surveillance test procedure.
C. RCIC injection is controlling Reactor water level.
D. Reactor pressure is controlled by manual SRV actuation.
E. Restoration of normal steam loads and turbine bypass system is required for a reactor cooldown.

INITIATING CUE

Perform a quick recovery from a Main Steam Line Isolation and reopen the MSIVs.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title Start HPCI in Pressure Control Mode; Suction Clogging

S/RO	52.OP.005.152	0	03/27/2013	Simulator
Appl To	JPM Number	Revision	Date	Setting

206000	A4.04	3.7/3.7	Y	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/27/2013	20
Author	Date	Validation Time (min)

Validated | | Approval |

3/28/2013		4/8/13
Operations Instructor	Date	Nuclear Trng Supv R. Strong	Date

Examinee Name: ______________________ ______________________
Last, First MI Employee Number

Exam Date: ______________ Exam Duration (Min) ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________

Name Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 52.OP.005.152

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-152-001, HPCI SYSTEM, REV 49

B. AR-114-001 (F02) HPCI PUMP SUCTION LO PRESS, REV 28

III. OPERATIONAL ACTIVITIES

44 HPCI Recovery From Isolation

IV. TASK CONDITIONS

A. Reactor scram occurred from an MSIV isolation.
B. Reactor water level and pressure are currently being controlled with RCIC and SRVs.
C. It is desired to place HPCI in pressure control mode.
D. ESW, Suppression Pool Cooling, and Standby Gas Treatment have been placed in service in preparation for starting HPCI.
E. SO-159-010 is in progress and being controlled by another operator.
F. Suppression Pool level will be controlled per OP-159-001 by another operator.

V. INITIATING CUE

Place HPCI in pressure control mode per OP-152-001 and maximize pressure reduction with HPCI.

VI. TASK STANDARD

HPCI is started in pressure control mode. Low suction pressure identified and HPCI secured.

VII. TASK SAFETY SIGNIFICANCE

HPCI equipment damage minimized.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 52.OP.005.152 Student Name: ______

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE • This JPM must be performed in the simulator. • Reset the simulator to IC–384. • Setup the simulator in accordance with the attached Simulator Setup Instructions. • Prior to performing this JPM, obtain a copy of the latest revision of OP-152-001 section 2.6 and provide to candidate. • There are separate cue sheets for RO and SRO candidates. Provided RO candidates with only the RO cue sheet. Provide SRO candidates with only the SRO cue sheet.			
1.	Obtain a controlled copy of OP-152-001, HPCI System section 2.6.	Obtains Controlled copy from evaluator.		
2.	Determines steps 2.6.1 through 2.6.3 are met or have been completed.	Continues at step 2.6.4.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 52.OP.005.152 Student Name: ______

Step	Action	Standard	Eval	Comments
3.	IF time permits, Evacuate personnel from HPCI Pump Room and HPCI Pipe Area 670' Reactor Building. (Once HPCI is operating, pump room and pipe area may be accessed again.) **EVALUATOR NOTE** If desired, tell candidate to NOT broadcast announcement over PA system.	Makes plant announcement to evacuate HPCI Pump Room.		
4.	Ensure HPCI TEST LINE TO CST ISO HV-155-F008 CLOSED.	Observes HV-155-F008 amber light on, red light off.		
5.	Ensure HPCI PUMP DSCH HV-155-F007 OPEN.	Observes HV-155-F007 amber light off, red light on.		
6.	Ensure HPCI PUMP SUCT FROM SUPP POOL HV-155-F042 CLOSED.	Observes HV-155-F042 amber light on, red light off.		
7.	Ensure HPCI PUMP SUCT FROM CST HV-155-F004 OPEN.	Observes HV-155-F004 amber light off, red light on.		
*8.	Open HPCI TEST LINE TO CST HV-155-F011.	Opens HV-155-F011 by rotating control switch clockwise to OPEN.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 52.OP.005.152 Student Name:

Step	Action	Standard	Eval	Comments
*9.	Place HPCI TURBINE FLOW CONTROL FC-E41-1R600 in MANUAL set at minimum.	Places FC-E41-1R600 in manual by flipping selector to the left to M. Sets FC-E41-1R600 to minimum by depressing CLOSE pushbutton until needle indicates 0.		
10.	Open HPCI L O CLG WTR HV-156-F059.	Opens HV-156-F059 by rotating control switch clockwise to OPEN.		
11.	Start HPCI BARO CDSR VACUUM PP 1P216.	Starts 1P216 by rotating control switch clockwise to START.		
12.	Initiate TRA. **EVALUATOR CUE** Another operator has initiated TRA.	Acknowledges cue.		
*13.	Simultaneously Start HPCI AUXILIARY OIL PUMP 1P213, AND Open HPCI TURBINE STEAM SUPPLY HV-155-F001.	Starts 1P213 by rotating control switch clockwise to START. Opens HV-155-F001 by rotating control switch clockwise to OPEN.		

* = Critical Step
# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 52.OP.005.152 Student Name: ____________

Step	Action	Standard	Eval	Comments
*14.	Simultaneously Accelerate HPCI Turbine with HPCI TURBINE FLOW CONTROL FC-E41-1R600 until HPCI Pump flow can be maintained 2500 5000 gpm, AND Throttle HPCI TEST LINE TO CST ISO HV-155-F008 to achieve either of following as required by Emergency Operating Procedures: • Reactor pressure < 1087 psig, OR • Cooldown rate <100 °F/hr.	Accelerates HPCI by depressing FC-E41-1R600 OPEN pushbutton. Throttles open HV-155-F008 by rotating control switch clockwise to OPEN.		

FAULT STATEMENT

When HPCI flow exceeds 150 gpm, blockage will develop in the pump suction piping. HPCI parameters will become erratic. AR-114-001 (F02), HPCI PUMP SUCTION LO PRESS, will alarm and provide guidance for ensuring HPCI trips. HPCI will fail to automatically trip. This will required the candidate to manually trip HPCI or isolate the steam supply.

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 52.OP.005.152 Student Name: ____________

Step	Action	Standard	Eval	Comments
15.	Recognize / report annunciator AR-114-001 (F02), HPCI PUMP SUCTION LO PRESS. **EVALUATOR NOTE** HPCI fails to automatically trip. AR-114-001 (F02) provides guidance to ensure HPCI trips. **EVALUATOR CUE** If candidate asks for further direction, ask them to make a recommendation, and then direct them to carry out their recommendation.	Recognize / report annunciator AR-114-001 (F02), HPCI PUMP SUCTION LO PRESS.		

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 52.OP.005.152 Student Name: ______________________

Step	Action	Standard	Eval	Comments
*16.	Secures HPCI. **EVALUATOR CUE** This completes the JPM. **EVALUATOR** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	Secures HPCI by at least one of the following: • Closes TURBINE STEAM SUPPLY HV-155-F001 by rotating control switch counterclockwise to CLOSE. AND/OR • Closes STM SUPPLY IB ISO HV-155-F002 by rotating keyswitch counterclockwise to CLOSE. AND/OR • Closes STM SUPPLY OB ISO HV-155-F003 by rotating keyswitch counterclockwise to CLOSE.		

* = Critical Step
\# = Critical Sequence

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
S/RO 52.OP.005.152

- From a power operating IC, insert the following to setup the HPCI suction blockage and defeat the automatic HPCI turbine trip:

  aet n13jpmFet1

  With **n13jpmFet1.et** having the following conditions:

  ;METER:HPCI PUMP DISCHARGE
  aoFIE411R6001.CurrValue >= 150

  And **n13jpmFet1.scn** having the following commands:

  IMF cmfMV07_HV155F004 f:10
  IOR doHS15504_1 f:OFF
  IOR doHS15504_2 f:ON
  IMF cmfRL01_K411K12

- Insert the following to allow the manual HPCI TURB TRIP pushbutton to operate:

  aet n13jpmFet2

With n13jpmFet2.et having the following condition:

  ;SWITCH:HPCI TURBINE TRIP (1S19)
  diHS15661A.CurrValue = #OR.diHS15661A.RESET

And n13jpmFet2.scn having the following command:

  DMF cmfRL01_K411K12

- Place the simulator in RUN.
- Place the Mode Switch in SHUTDOWN.
- Close the MSIVs.
- Take action to stabilize Reactor water level and pressure. Establish level control with RCIC and pressure control with SRVs. Start ESW, Suppression Pool cooling, and Standby Gas Treatment to setup for HPCI start.
- Allow plant conditions to stabilize.
- Place the simulator in Freeze.
- Consider snapping an IC for multiple performances of this JPM.
- When student is ready to begin **JPM**, place the simulator in **RUN**.

RO Handout

TASK CONDITIONS

A. Reactor scram occurred from an MSIV isolation.
B. Reactor water level and pressure are currently being controlled with RCIC and SRVs.
C. It is desired to place HPCI in pressure control mode.
D. ESW, Suppression Pool Cooling, and Standby Gas Treatment have been placed in service in preparation for starting HPCI.
E. SO-159-010 is in progress and being controlled by another operator.
F. Suppression Pool level will be controlled per OP-159-001 by another operator.

INITIATING CUE

Place HPCI in pressure control mode per OP-152-001 and maximize pressure reduction with HPCI.

RO Handout

TASK CONDITIONS

A. Reactor scram occurred from an MSIV isolation.
B. Reactor water level and pressure are currently being controlled with RCIC and SRVs.
C. It is desired to place HPCI in pressure control mode.
D. ESW, Suppression Pool Cooling, and Standby Gas Treatment have been placed in service in preparation for starting HPCI.
E. SO-159-010 is in progress and being controlled by another operator.
F. Suppression Pool level will be controlled per OP-159-001 by another operator.

INITIATING CUE

Place HPCI in pressure control mode per OP-152-001 and maximize pressure reduction with HPCI.

SRO Handout

TASK CONDITIONS

A. Reactor scram occurred from an MSIV isolation.
B. Reactor water level and pressure are currently being controlled with RCIC and SRVs.
C. It is desired to place HPCI in pressure control mode.
D. ESW, Suppression Pool Cooling, and Standby Gas Treatment have been placed in service in preparation for starting HPCI.
E. SO-159-010 is in progress and being controlled by another operator.
F. Suppression Pool level will be controlled per OP-159-001 by another operator.

INITIATING CUE

Place HPCI in pressure control mode and maximize pressure reduction with HPCI.

SRO Handout

TASK CONDITIONS

A. Reactor scram occurred from an MSIV isolation.
B. Reactor water level and pressure are currently being controlled with RCIC and SRVs.
C. It is desired to place HPCI in pressure control mode.
D. ESW, Suppression Pool Cooling, and Standby Gas Treatment have been placed in service in preparation for starting HPCI.
E. SO-159-010 is in progress and being controlled by another operator.
F. Suppression Pool level will be controlled per OP-159-001 by another operator.

INITIATING CUE

Place HPCI in pressure control mode and maximize pressure reduction with HPCI.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Immediate Operator Action For Control Room Evacuation

S/RO	00.ON.015.154	0	03/27/2013	Simulator
Appl To	JPM Number	Revision	Date	Setting

212000	A4.01	4.6/4.6	Y	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/27/2013	10
Author	Date	Validation Time (min)

Validated | Approval

[signature]	3/27/2013	[signature]	4/8/13
Operations Instructor	Date	Nuclear Trng Supv R. Snow	Date

Examinee Name: ______________________ Last, First MI ______________________ Employee Number

Exam Date: ____________ Exam Duration (Min) ____________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ Name ______________________ Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 00.ON.015.154

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. ON-100-109, CONTROL ROOM EVACUATION, REV 27

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. A condition has occurred requiring evacuation of the Control Room.
B. You are the only PCO in the Control Room.
C. Conditions in the Control Room are degrading, but remain habitable for the moment.
D. Security has been notified to provide access to both Units' Remote Shutdown Panels.
E. The Control Room evacuation has already been announced over the plant PA system.
F. NERO has already been activated.

V. INITIATING CUE

Perform the Immediate Operator Actions of Control Room evacuation.

VI. TASK STANDARD

Performs immediate actions for Control Room evacuation per ON–100–009. Corrects misalignment of Feedwater, HPCI, and RCIC flow controllers.

VII. TASK SAFETY SIGNIFICANCE

Failure to perform the immediate actions of ON–100–009 when necessary places the plant in the undesirable condition of not being able to control the reactor from outside the Control Room when necessary. Failure to properly align high pressure injection sources challenges Reactor water level control and maintenance of adequate core cooling.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 00.ON.015.154 Student Name: ______

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE • This JPM must be performed in the simulator. • Reset the simulator to IC–385. • Ensure the simulator is setup in accordance with the attached Simulator Setup Instructions. • Prior to performing this JPM, obtain a copy of the latest revision of ON-100-109 and provide to candidate.			
1.	Obtain a controlled copy of ON-100-109, Control Room Evacuation.	Obtains Controlled copy from evaluator or Hard Card from rack near Unit 1 Unit Supervisor's desk.		
*2.	Place MODE SWITCH HS-C72A-1S01 to SHUTDOWN.	Rotates the Mode Switch counterclockwise to SHUTDOWN (Panel 1C651).		
3.	Ensure all control rods INSERTED.	Observes all control rods are inserted (Panel 1C651).		
4.	Insert SRMs and IRMs.	Inserts SRMs and IRMs by depressing all SRM and IRM SELECT (12) pushbuttons and then depressing DRIVE IN and Power On pushbuttons (Panel 1C601).		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 00.ON.015.154 Student Name: ____________

Step	Action	Standard	Eval	Comments
*5.	Close HV-141-F022A,B,C, & D, HV-141-F028A,B,C & D, HV-141-F016 and HV-141-F019 MSIVs and MSL drains using control switches.	*Closes the following valves by rotating the following control switches counterclockwise to CLOSE (Panel 1C601): • HV-141-F022A • HV-141-F022B • HV-141-F022C • HV-141-F022D • HV-141-F028A • HV-141-F028B • HV-141-F028C • HV-141-F028D Observes the following valves amber lights are on, red lights are off **(not critical)**(Panel 1C601): • HV-141-F016 • HV-141-F019		
6.	Trip RFPT A, B & C using RFP A(B)(C) TRIP pushbuttons HS-12745A, B and C.	Trips RFPTs by depressing the following TRIP pushbuttons (Panel 1C651): • HS-12745A • HS-12745B • HS-12745C		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 00.ON.015.154 Student Name: ____________

Step	Action	Standard	Eval	Comments
7.	Shutdown Condensate Pumps in order to leave 2 pumps in service.	Secures Condensate pumps by depressing STOP pushbuttons to leave two pumps in service (Panel 1C651).		
*8.	Close RWCU Inlet IB Iso HV-144-F001.	Closes HV-144-F001 by rotating control switch counterclockwise to CLOSE (Panel 1C651).		
*9.	Close RWCU Inlet OB Iso Vlv HV-144-F004.	Closes HV-144-F004 by rotating control switch counterclockwise to CLOSE (Panel 1C651).		
10.	WHEN RPV level is > 15", Reset FW setpoint setdown.	Resets FW setpoint setdown by touching HMI button HS-C32-1S08 RESET SETPT SETDOWN (Panel 1C651).		

FAULT STATEMENT

In subsequent steps, Feedwater level control, HPCI flow control, and RCIC flow control are all misaligned from their expected condition in such a way that automatic high pressure injection to the Reactor is significantly degraded:

- The Feedwater low flow controller is in manual vice auto, and fully closed.
- The HPCI flow controller is in manual vice auto, and fully closed.
- The RCIC flow controller is in auto, but is set to ~0 gpm.

The candidate must recognize these issues and take action to correct them to ensure proper Reactor water level control.

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 00.ON.015.154 Student Name: ______

Step	Action	Standard	Eval	Comments
*11.	Ensure FW LOW LOAD DEMAND SIGNAL TO LV-10641, LIC-C32-1R602 in AUTO with a Level Setpoint of 35".	Touches HMI button 641(Panel 1C651). Observes LIC-C32-1R602 MAN button has yellow backlight. *Depresses LIC-C32-1R602 AUTO button. *Depresses LIC-C32-1R602 INC(DEC) LVL SETPT buttons as necessary to adjust setpoint to 35”.		
12.	Ensure HV-10603A, B & C RFP A, B & C DSCH ISO Vlvs CLOSED.	Observes HMI indications for 603A, 603B, and 603C indicate yellow (Panel 1C651).		
13.	Open HV-155-F011 HPCI TEST LINE TO CST ISO.	Opens HV-155-F011 by rotating control switch clockwise to OPEN (Panel 1C601).		
*14.	Ensure HPCI in AUTO set for 5100 gpm.	Observes HPCI controller selector in M position (Panel 1C601). *Places HPCI controller selector in A position. Observes HPCI controller thumbwheel setpoint indicates ~5100 gpm.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 00.ON.015.154 Student Name: ____________

Step	Action	Standard	Eval	Comments
*15.	Ensure RCIC in AUTO set for 625 gpm. **EVALUATOR CUE** This completes the JPM. **EVALUATOR** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	Observes RCIC controller selector in A position (Panel 1C601). Observes RCIC controller thumbwheel setpoint indicates ~0 gpm. *Adjusts RCIC controller thumbwheel setpoint to ~625 gpm.		

* = Critical Step
\# = Critical Sequence

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
S/RO 00.ON.015.154

- From a power operating IC, perform the following:
  - Place LIC-C32-1R602, FW LO LOAD DEMAND SIGNAL TO VL-10641, in MAN.
  - Place the HPCI flow controller in M.
  - Set the RCIC flow controller automatic setpoint to ~0 gpm.
  - Insert malfunction cmfCN03_FCE411R600 f:0 to fail HPCI flow controller manual output to zero.
- Place the simulator in RUN.
- Allow plant conditions to stabilize.
- Place the simulator in Freeze.
- Consider snapping an IC for multiple performances of this JPM.
- When student is ready to begin **JPM**, place the simulator in **RUN**.

TASK CONDITIONS

A. A condition has occurred requiring evacuation of the Control Room.
B. You are the only PCO in the Control Room.
C. Conditions in the Control Room are degrading, but remain habitable for the moment.
D. Security has been notified to provide access to both Units' Remote Shutdown Panels.
E. The Control Room evacuation has already been announced over the plant PA system.
F. NERO has already been activated.

INITIATING CUE

Perform the Immediate Operator Actions of Control Room evacuation.

TASK CONDITIONS

A. A condition has occurred requiring evacuation of the Control Room.
B. You are the only PCO in the Control Room.
C. Conditions in the Control Room are degrading, but remain habitable for the moment.
D. Security has been notified to provide access to both Units' Remote Shutdown Panels.
E. The Control Room evacuation has already been announced over the plant PA system.
F. NERO has already been activated.

INITIATING CUE

Perform the Immediate Operator Actions of Control Room evacuation.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title Vent the Drywell

S/RO	73.OP.001.101	2	03/18/2013	Simulator
Appl To	JPM Number	Revision	Date	Setting

223001	A2.07	4.2/4.3	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/18/2013	15
Author	Date	Validation Time (min)

Validated

Approval

	3/28/2013	E. Snyder	4/8/13
Operations Instructor	Date	Nuclear Trng Supv	Date

Examinee Name: ______________________ ______________________

Last, First MI Employee Number

Exam Date: ______________ Exam Duration (Min) ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________

Name Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 73.OP.001.101

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-173-003, PRIMARY CONTAINMENT NITROGEN MAKEUP AND VENTING, REV 11

B. OP-070-001, STANDBY GAS TREATMENT SYSTEM, REV 23

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. Unit 1 is in Mode 1.
B. Drywell pressure is 0.4 psig up slow.

V. INITIATING CUE

Reduce Drywell pressure to 0.2 psig per OP-173-003, Primary Containment Nitrogen Makeup and Venting section 2.3. All prerequisites have been met. All TR/TS requirements are satisfied.

VI. TASK STANDARD

SGTS in operation, Drywell venting lined up with Drywell pressure being reduced.

VII. TASK SAFETY SIGNIFICANCE

Avoid an unnecessary high Drywell pressure scram.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.001.101 Student Name: ____________________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE • This JPM must be performed in the simulator. • Reset the simulator to IC–383. • Setup the simulator in accordance with the attached Simulator Setup Instructions. • Prior to performing this JPM, obtain a copy of the latest revision of OP-173-103 section 2.3 and OP-070-001 section 2.2. Provide these procedures to the candidate at the appropriate times. • There are separate cue sheets for RO and SRO candidates. Provided RO candidates with only the RO cue sheet. Provide SRO candidates with only the SRO cue sheet.			
1.	Obtain a controlled copy of OP-173-003, Primary Containment Nitrogen Makeup and Venting.	Obtains Controlled copy of OP-173-003 from evaluator.		

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.001.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
2.	Manually Start SGTS in accordance with OP-070-001. **EVALUATOR CUE** If necessary inform the student all prerequisites and precautions have been met and that an NPO has checked both SGTS trains SAT. **EVALUATOR CUE** Role-play the Unit Supervisor and instruct candidate to start the "A" train of SGTS.	Obtains Controlled copy of OP-070-001 from evaluator. Selects section 2.2.		
*3.	At Panel 0C681, Depress SGTS Clg 0A Dmp HD07555A OPEN pushbutton. **EVALUATOR NOTE** HD07555A remains open for approximately 120 seconds after its respective pushbutton is released. JPM steps 3 through 5 must be performed expeditiously to establish a flow path and allow SGTS to start.	Opens HD07555A by depressing OPEN pushbutton.		
4.	Observe SGTS Clg 0A Dmp HD07555A OPENS to allow suction flow path for start of SGTS Fan A.	Observe HD07555A red light on, amber light off.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.001.101 Student Name:

Step	Action	Standard	Eval	Comments
*5.	At Panel 0C681, Start Standby Gas Treatment System A by placing selector switch for SGTS Fan 0V109A to START.	Starts Standby Gas Treatment System A by rotating selector switch clockwise to START.		
6.	When Fan starts, Observe flow increases >3000 cfm on SGTS Air Flow FR07553A.	Observes flow >3000 cfm on FR07553A.		
7.	Check following positioned as indicated:			
	• SGTS Makeup 0A Dmp FD07551A2 MODULATED/OPEN approximately 120 seconds after SGTS Fan 0V109A started.	Observes FD07551A2 red light on after approximately 120 seconds (amber light may be on or off).		
	• SGTS Fan Inlet Dmp HD07552A FULL OPEN.	Observes HD07552A red light on, amber light off.		
	• SGTS A Inlet Dmp HD07553A FULL OPEN.	Observes HD07553A red light on, amber light off.		
8.	Vent desired system to SGTS Inlet Header as follows: • For inerting, purging or primary containment pressure control for Unit 1, Perform actions for desired evolution in accordance with OP-173-001 and OP-173-003.	Returns to OP-173-003 section 2.3.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.001.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
9.	Ensure Drywell pressure does not become >0.5 psig below suppression chamber pressure, to prevent opening vacuum breakers.	Acknowledges step.		
10.	Log vent start time in Unit 1 Log. **EVALUATOR CUE** Start time has been logged by another operator.	Informs evaluator of need to log vent start time.		
*11.	Open following: • HD17508A DRWL/WETWELL BURP DMP	Opens HD17508A by rotating control switch clockwise to OPEN (Panel 1C681).		
*12.	• HD17508B DRWL/WETWELL BURP DMP	Opens HD17508B by rotating control switch clockwise to OPEN (Panel 1C681).		
*13.	• HV-15713 DRWL VENT IB ISO	Opens HV-15713 by depressing OPEN pushbutton.		
*14.	• HV-15711 DRWL VENT BYPS OB ISO	Opens HV-15711 by depressing OPEN pushbutton.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.001.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
15.	Monitor Drywell Pressure using any of the following: • Computer point MAP01 or MAP001Z • PPC screen CONTN • PI-15702 CONTN OR SUPP CHMBR PRESS with selector switch HSS-15702 selected to CONTN **EVALUATOR CUE** This completes the JPM. **EVALUATOR** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	Monitors Drywell pressure and determines it is lowering.		

* = Critical Step
\# = Critical Sequence

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
S/RO 73.OP.001.101

- From a power operating IC, open N2 makeup valves SV-15767 and SV-15789 (found on P&ID PC5) until Drywell pressure rises to 0.4 psig. Then close these valves.
- Allow plant conditions to stabilize.
- Place the simulator in Freeze.
- Consider snapping an IC for multiple performances of this JPM.
- When student is ready to begin **JPM**, place the simulator in **RUN**.

RO Handout

TASK CONDITIONS

A. Unit 1 is in Mode 1.
B. Drywell pressure is 0.4 psig up slow.

INITIATING CUE

Reduce Drywell pressure to 0.2 psig per OP-173-003, Primary Containment Nitrogen Makeup and Venting section 2.3. All prerequisites have been met. All TR/TS requirements are satisfied.

RO Handout

TASK CONDITIONS

A. Unit 1 is in Mode 1.
B. Drywell pressure is 0.4 psig up slow.

INITIATING CUE

Reduce Drywell pressure to 0.2 psig per OP-173-003, Primary Containment Nitrogen Makeup and Venting section 2.3. All prerequisites have been met. All TR/TS requirements are satisfied.

SRO Handout

TASK CONDITIONS

A. Unit 1 is in Mode 1.
B. Drywell pressure is 0.4 psig up slow.

INITIATING CUE

Vent the Drywell to reduce Drywell pressure to 0.2 psig. All prerequisites have been met. All TR/TS requirements are satisfied.

SRO Handout

TASK CONDITIONS

A. Unit 1 is in Mode 1.
B. Drywell pressure is 0.4 psig up slow.

INITIATING CUE

Vent the Drywell to reduce Drywell pressure to 0.2 psig. All prerequisites have been met. All TR/TS requirements are satisfied.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title Pull Scram Fuses; Vent Scram Air Header

S/RO	58.EO.001.151	0	03/25/2013	Plant
Appl To	JPM Number	Revision	Date	Setting

295037	EA1.01	4.6/4.6	Y	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/25/2013	20
Author	Date	Validation Time (min)

Validated | Approval

RC [signature]	3/28/2013	[signature]	4/8/13
Operations Instructor	Date	Nuclear Trng Supv R. Snow	Date

Examinee Name: ______________________ ______________
Last, First MI | Employee Number

Exam Date: ____________ Exam Duration (Min) ____________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator

______________________ ______________________
Name | Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 58.EO.001.151

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. ES-158-001, DE-ENERGIZING SCRAM PILOT SOLENOIDS, REV 12

B. EO-100-113 Sheet 2, CONTROL ROD INSERTION, REV 10

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. Unit 1 has received a valid scram signal.

B. All control rods are not full in and all scram channel lights remain lit.

C. EO-100-113, Level/Power Control, has been entered.

D. ARI has been manually initiated.

E. The scram air header is still pressurized.

V. INITIATING CUE

Insert control rods by removing RPS fuses IAW ES-158-001, DE-ENERGIZING SCRAM PILOT SOLENOIDS.

VI. TASK STANDARD

Provide an alternate means of Control Rod Insertion. This will initially be attempted by de-energizing RPS circuitry through fuse removal. The fuse removal cannot be accomplished due to cabinet doors being stuck. The alternate path is to vent the scram air header locally.

VII. TASK SAFETY SIGNIFICANCE

Alternate methods to insert control rods are designed to limit threat to core and containment by minimizing the duration of the ATWS event.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 58.EO.001.151 Student Name: ____________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE Prior to performing this JPM, obtain a copy of the latest revision of ES-158-001, mark it up as if it were actually to be performed, and provide it to the student along with the Task Conditions/Initiating Cue Sheet. Also obtain a copy of Hard Card for venting the scram air header, but do NOT initially provide to student.			
1.	Review Sections 1.0 through 3.0.	Review all sections. Follows all precautions as applicable.		
2.	(Step 4.1) Notes Shift Supervision permission to perform this ES procedure.	Verifies Shift Supervision signature, date, and time in the appropriate location in Section 4.1 of the procedure.		
	EVALUATOR NOTE With Shift Supervision permission, have the student show you the required equipment, but do not remove it from the Shift Manager's office. The equipment can also be located in the OSC ES Box.			
3.	Obtain the required equipment.	Obtains the required equipment from the ES Box in the Shift Manager's office or OSC (fuse pullers and low voltage rubber gloves).		

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 58.EO.001.151 Student Name: ____________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE RPS logic Channel A indications are located on the front of Panel 1C609 in the Upper Relay Room.			
4.	(Step 4.2) Ensure RPS logic Channel A de-energized by performing one of following at 1C609 RPS Trip Sys A1/A2 NSS Shutoff Sys Panel (Upper Relay Room): (Step 4.2.1) Observe NO Rod Group Scram Indicators Division 1, ILLUMINATED: a. C72A-DS2C, Rod Group 1 b. C72A-DS2G, Rod Group 2 c. C72A-DS2E, Rod Group 3 d. C72A-DS2A, Rod Group 4 **EVALUATOR CUE** When candidate locates above lights, say that all Division 1 Rod Group Scram Indicator lights are LIT.	Observes the following Division 1 Rod Group Scram Indicators NOT LIT: • C72A-DS2C, Rod Group 1 • C72A-DS2G, Rod Group 2 • C72A-DS2E, Rod Group 3 • C72A-DS2A, Rod Group 4		

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 58.EO.001.151 Student Name:

Step	Action	Standard	Eval	Comments
5.	(Step 4.2.2.a) Perform following: Notify the Control Room to expect BACKUP/GROUP SYSTEM A POWER FAILURE alarms on 1C651. **EVALUATOR CUE** Role play the Control Room and acknowledge the report. **EVALUATOR NOTE** The following two fuses are located in the RPS A2 (left side) right door, lower right side.	Contacts the Control Room and informs the Control Room to expect BACKUP/GROUP SYSTEM A POWER FAILURE alarms on 1C651.		
*6.	(Step 4.2.2.b) Remove following fuses: (1) F46-C72A-F18C (2) F47-C72A-F18G **EVALUATOR NOTE** Candidate may ask Control Room BACKUP/GROUP SYSTEM A POWER FAILURE alarms on 1C651. If so, inform candidate that alarm came in.	Using the fuse puller and low voltage gloves, simulates removing the following fuses from the fuse holder: • F46-C72A-F18C • F47-C72A-F18G		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 58.EO.001.151 Student Name: ____________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE The following two fuses are located in the RPS A1 (right side) right door, lower left side.			
*7.	(Step 4.2.2.b) Remove following fuses: (1) F52-C72A-F18A (2) F53-C72A-F18E	Using the fuse puller and low voltage gloves, removes the following fuses from the fuse holder: • F52-C72A-F18A • F53-C72A-F18E		
8.	(Step 4.3) Observe BACKUP/GROUP PILOT SCRAM SYSTEM A POWER FAILURE annunciator clears at 1C651. **EVALUATOR CUE** Role play the Control Room PCO and inform the student that BACKUP/GROUP SYSTEM A POWER FAILURE alarm has cleared.	Contacts the Control Room and requests the PCO to verify the BACKUP/GROUP SYSTEM A POWER FAILURE alarm has cleared on 1C651.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 58.EO.001.151 Student Name: ______

Step	Action	Standard	Eval	Comments
9.	(Step 4.4) Ensure RPS logic Channel B de-energized by performing one of following at 1C611 RPS Trip Sys B1/B2 NSS Shutoff Sys Panel (Lower Relay Room): (Step 4.4.1) Observe NO Rod Group Scram Indicators Division 2, ILLUMINATED: a. C72A-DS2D, Rod Group 1 b. C72A-DS2H, Rod Group 2 c. C72A-DS2F, Rod Group 3 d. C72A-DS2B, Rod Group 4 **EVALUATOR CUE** When candidate locates above lights, say that all Division 2 Rod Group Scram Indicator lights are LIT. **CAUTION** **The Following Step Results In The Inability To Close The SDV Vent And Drain Valves If Fuses Were Also Pulled For Channel A. Prompt Restoration Of Fuses Is Necessary To Minimize The Time The Valves Remain Open.**	Verifies the following Division 2 Rod Group Scram Indicators NOT LIT: • C72A-DS2D, Rod Group 1 • C72A-DS2H, Rod Group 2 • C72A-DS2F, Rod Group 3 • C72A-DS2B, Rod Group 4		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 58.EO.001.151 Student Name: ____________

Step	Action	Standard	Eval	Comments
10.	(Step 4.4.2.a) Perform following: Notify the Control Room to expect BACKUP/GROUP SYSTEM B POWER FAILURE alarms on 1C651. **EVALUATOR CUE** Role play the Control Room and acknowledge the report.	Contacts the Control Room and informs the Control Room to expect BACKUP/GROUP SYSTEM B POWER FAILURE alarms on 1C651.		
FAULT STATEMENT When the student attempts to open the RPS B1 and B2 doors, they will be informed that the doors are stuck shut and CANNOT be opened. They will be cued to take alternate actions IAW EO-100-113 Sheet 2 to insert control rods as rapidly as possible from outside the Control Room. The student shall proceed to vent the scram air header.				
	NOTE The following two fuses are located in the RPS B2 (left side) right door, lower right side.			

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 58.EO.001.151 Student Name: ____________

Step	Action	Standard	Eval	Comments
11.	(Step 4.4.2.b) Attempts to remove following fuses: (1) F51-C72A-F18D (2) F52-C72A-F18H **EVALUATOR CUE** As the student moves to open either door for RPS B1 and B2 fuses, inform them that the doors are stuck shut and CANNOT be opened by any means. When the student reports inability to insert control rods by pulling RPS fuses, direct them to take alternate actions IAW EO-100-113 Sheet 2 to insert control rods as rapidly as possible from outside the Control Room.	Acknowledges evaluator cue and reports that control rods CANNOT be inserted by pulling RPS fuses.		
12.	Determines alternate method for inserting control rods as rapidly as possible from outside the Control Room IAW EO-100-113 Sheet 2. **EVALUATOR NOTE** When the student determines venting the scram air header is required, provide copy of associated Hard Card.	Determines venting the scram air header is required.		
13.	(Step 1) Open ARI Sys Solenoid Valves Bypass 147021	ARI Solenoid Valve Bypass Valve 147021 is simulated being opened by rotating the valve handle to the parallel position.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 58.EO.001.151 Student Name: ____________

Step	Action	Standard	Eval	Comments
	EVALUATOR CUE When the candidate indicates they will rotate the handle in the correct direction, state that the handle rotates until it reaches a hard stop parallel to the pipe. • Valve handle 147021 simulated being rotated to the parallel position			
*14.	(Step 2) Close Scram Air Supply 1470002A and 147002B **EVALUATOR NOTE** Since only one valve is normally open, the other valve should be checked closed. **EVALUATOR CUE** When the candidate indicates they will rotate the handwheel of the open valve in the CW direction, state that the handwheel rotates until it reaches a hard stop. The closed valve will not turn in the CW direction.	Simulates closing or checking closed SCRAM AIR SUPPLY Valves 147002A and 147002B by rotating the valve handle in the clockwise direction until seated.		

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 58.EO.001.151 Student Name: ______

Step	Action	Standard	Eval	Comments
*15.	(Step 3) Uncap Scram Air Header Vent 147007 **EVALUATOR NOTE** The pipe cap is normally installed finger tight and can be removed by hand with proper PPE. The candidate may desire to use a pipe wrench to remove the pipe cap. **EVALUATOR CUE** When the candidate describes the proper method of removing the cap, state that the cap unscrews smoothly until fully removed.	Simulates uncapping SCRAM AIR HDR VENT Valve 147007 by rotating it CCW.		
*16.	(Step 3) Open Scram Air Header Vent 147007 **EVALUATOR CUE** The valve handle rotates smoothly and stops at the parallel position. The sound of air flow is heard.	Simulates opening 147007 by slowly rotating the handle to the parallel position.		

* = Critical Step
# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 58.EO.001.151 Student Name: ____________

Step	Action	Standard	Eval	Comments
17.	Notify Control Room that the Scram Air Header is vented. **EVALUATOR CUE** Inform candidate Control Room has been notified and all control rods have inserted, no further system manipulation required. **EVALUATOR CUE** This completes the JPM. **EVALUATOR** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	Simulates reporting to the Control Room, by Radio or Page, that air is venting from the 147007 valve.		

* = Critical Step
\# = Critical Sequence

TASK CONDITIONS

A. Unit 1 has received a valid scram signal.

B. All control rods are not full in and all scram channel lights remain lit.

C. EO-100-113, Level/Power Control, has been entered.

D. ARI has been manually initiated.

E. The scram air header is still pressurized.

INITIATING CUE

Insert control rods by removing RPS fuses IAW ES-158-001, DE-ENERGIZING SCRAM PILOT SOLENOIDS.

TASK CONDITIONS

A. Unit 1 has received a valid scram signal.

B. All control rods are not full in and all scram channel lights remain lit.

C. EO-100-113, Level/Power Control, has been entered.

D. ARI has been manually initiated.

E. The scram air header is still pressurized.

INITIATING CUE

Insert control rods by removing RPS fuses IAW ES-158-001, DE-ENERGIZING SCRAM PILOT SOLENOIDS.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Start Containment Hydrogen Recombiner

S/RO	73.OP.011.102	5	03/25/2013	Plant
Appl To	JPM Number	Revision	Date	Setting
223001	A2.01	4.3/4.4	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/25/2013	20
Author	Date	Validation Time (min)

Validated / Approval

	3/28/2013		4/8/13
Operations Instructor	Date	Nuclear Trng Supv R. Simpson	Date

Examinee Name: ____________________ Last, First MI ____________________ Employee Number

Exam Date: ____________ Exam Duration (Min) ____________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ____________________ Name ____________________ Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 73.OP.011.102

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP–AD–002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-173-001, CONTAINMENT ATMOSPHERE CONTROL SYSTEM (Rev. 40)

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A. The plant is in a post-LOCA condition approximately 24 hours after the event.

B. Containment H_2 and O_2 concentrations are below combustible limits.

C. Pre-LOCA containment temperature was 135°F.

D. Post-LOCA containment pressure is 6 psig.

V. INITIATING CUE

Start Containment Hydrogen Recombiner 1E440A(B)(C)(D) in Manual.

VI. TASK STANDARD

Selected Recombiner operating in Manual IAW OP-173-001.

VII. TASK SAFETY SIGNIFICANCE

Recombiners are the primary means or hydrogen reduction in Containment post-LOCA. Failure to place the Recombiner(s) in service post-LOCA may result in excessive hydrogen concentrations in Containment and raise the risk of Containment damage due to hydrogen detonation/deflagration.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.011.102 Student Name: ______________________

Step	Action	Standard	Eval	Comments
	EVALUATOR NOTE Select which Recombiner is to be operated. A and C are in the Upper Relay Room; B and D are in the Lower Relay Room. Circle the selected Recombiner in the Initiating Cue. Prior to performing this JPM, obtain a copy of the latest revision of OP-173-001, mark it up as if it were actually to be performed, and provide it to the student along with the Task Conditions/Initiating Cue Sheet.			
1.	Obtain a controlled copy of OP-173-001, select correct section, and review procedure. **EVALUATOR CUE** If asked, inform the candidate that all prerequisites have been met.	Obtains a controlled copy of OP-173-001 from evaluator. Selects Section 2.10. Reviews prerequisites and precautions.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.011.102 Student Name: ______

Step	Action	Standard	Eval	Comments
2.	(Step 2.10.3) Ensure H_2 Recombiner aligned as follows prior to startup: (Step 2.10.3.a) Turn H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) in counter clockwise direction until potentiometer STOPS. **EVALUATOR CUE** Indicate H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) is rotated fully counterclockwise.	Simulates rotating H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) counterclockwise until potentiometer STOPS.		
3.	(Step 2.10.3.b) Set H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) to ZERO (000). **EVALUATOR CUE** Indicate H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) is at ZERO (000).	Simulates rotating H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) potentiometer to ZERO (000).		
4.	(Step 2.10.3.c) Observe H_2 RCB A(B)(C)(D) Power In Available White light ILLUMINATED indicating MCC feeder closed. **EVALUATOR CUE** Indicate H_2 RCB A(B)(C)(D) Power In Available White light is ILLUMINATED.	Observes H_2 RCB A(B)(C)(D) Power In Available White light.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.011.102 Student Name: ____________

Step	Action	Standard	Eval	Comments
5.*	(Step 2.10.5) To start H_2 Recombiner in Manual: (Step 2.10.5.a) Place H_2 Rcb A(B)(C)(D) Temp Ctl Select HSS 15796A(B)(C)(D) to MAN. **EVALUATOR CUE** Indicate H_2 Rcb A(B)(C)(D) Temp Ctl Select HSS-15796A(B)(C)(D) is in MAN.	Simulates placing H_2 Rcb A(B)(C)(D) Temp Ctl Select HSS-15796A(B)(C)(D) to MAN.		
6.*	(Step 2.10.5.b) Place H_2 Rcb A(B)(C)(D) Power Out Switch HS-15796A(B)(C)(D) to ON. **EVALUATOR CUE** Indicate H_2 Rcb A(B)(C)(D) Power Out Switch HS-15796A(B)(C)(D) is in ON.	Simulates placing H_2 Rcb A(B)(C)(D) Power Out Switch HS-15796A(B)(C)(D) to ON.		
7.	(Step 2.10.5.c) Verify Red light above HS-15796A(B)(C)(D) ILLUMINATES. **EVALUATOR CUE** Indicate Red light above HS-15796A(B)(C)(D) is ILLUMINATED.	Observes Red light above HS-15796A(B)(C)(D).		
8.	(Step 2.10.5.d) Determine required power setting from Attachment A.	Determines required power setting from Attachment A is approximately 54 KW.		

* = Critical Step
# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.011.102 Student Name: ____________

Step	Action	Standard	Eval	Comments
9.*	(Step 2.10.5.e) Raise power out to heater as follows: (Step 2.10.5.e(1)) Adjust H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) until H_2 Rcb A(B)(C)(D) Power Out to Heater XI-15796A(B)(C)(D) indicates 5 KW. **EVALUATOR CUE** H_2 Rcb A(B)(C)(D) Power Out to Heater XI-15796A(B)(C)(D) indicates 5 KW. **EVALUATOR CUE** 10 minutes have elapsed.	Simulates adjusting H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) until H_2 Rcb A(B)(C)(D) Power Out to Heater XI-15796A(B)(C)(D) indicates 5 KW.		
10.*	(Step 2.10.5.e(2)) After 10 minutes, Adjust HC-15796A(B)(C)(D) until XI-15796A(B)(C)(D) indicates 10 KW. **EVALUATOR CUE** H_2 Rcb A(B)(C)(D) Power Out to Heater XI-15796A(B)(C)(D) indicates 10 KW. **EVALUATOR CUE** 10 minutes have elapsed.	Simulates adjusting H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) until H_2 Rcb A(B)(C)(D) Power Out to Heater XI-15796A(B)(C)(D) indicates 10 KW.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.011.102 Student Name: ____________

Step	Action	Standard	Eval	Comments
11.*	(Step 2.10.5.e(3)) After 10 minutes, Adjust HC-15796A(B)(C)(D) until XI-15796A(B)(C)(D) indicates 20 KW. **EVALUATOR CUE** H_2 Rcb A(B)(C)(D) Power Out to Heater XI-15796A(B)(C)(D) indicates 20 KW. **EVALUATOR CUE** 5 minutes have elapsed.	Simulates adjusting H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) until H_2 Rcb A(B)(C)(D) Power Out to Heater XI-15796A(B)(C)(D) indicates 20 KW.		
12.*	(Step 2.10.5.e(4)) After 5 minutes, Adjust HC-15796A(B)(C)(D) until required power setting determined in 2.10.5.c of this procedure observed on XI-15796A(B)(C)(D).	Simulates adjusting H_2 Rcb A(B)(C)(D) Heater Power Adj Control HC-15796A(B)(C)(D) until H_2 Rcb A(B)(C)(D) Power Out to Heater XI-15796A(B)(C)(D) indicates approximately 54 KW.		
13.	(Step 2.10.5.e(5)) Monitor temperature periodically placing H_2 Rcb A(B)(C)(D) Temp Chan Select TSS-15796A(B) (C)(D) in following while observing temperature: • Position #1 • Position #2 (N/A for 1E440D) • Position #3 **EVALUATOR CUE** Temperature indicates 1250°F and stable.	Simulates rotating H_2 Rcb A(B)(C)(D) Temp Chan Select TSS-15796A(B)(C)(D) and monitoring temperature.		

* = Critical Step
\# = Critical Sequence

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 73.OP.011.102 Student Name: ______

Step	Action	Standard	Eval	Comments
14.	(Step 2.10.5.e(6)) Adjust HC-15796A(B)(C)(D) between O KW and calculated required power setting to maintain following: • H2 Recombiner temperature ~ 1250°F not to exceed 1400°F. • Required power setting on H2 Rcb A(B)(C)(D) Power Out to Heater XI-15796A(B)(C)(D) not to exceed 75 KW. **EVALUATOR CUE** This completes the JPM. **EVALUATOR** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	Determines temperature is approximately 1250°F and further adjustment is not required.		

TASK CONDITIONS

A. The plant is in a post-LOCA condition approximately 24 hours after the event.

B. Containment H_2 and O_2 concentrations are below combustible limits.

C. Pre-LOCA containment temperature was 135°F.

D. Post-LOCA containment pressure is 6 psig.

INITIATING CUE

Start Containment Hydrogen Recombiner 1E440A(B)(C)(D) in Manual.

TASK CONDITIONS

A. The plant is in a post-LOCA condition approximately 24 hours after the event.

B. Containment H_2 and O_2 concentrations are below combustible limits.

C. Pre-LOCA containment temperature was 135°F.

D. Post-LOCA containment pressure is 6 psig.

INITIATING CUE

Start Containment Hydrogen Recombiner 1E440A(B)(C)(D) in Manual.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Establish RPV Alternate Injection with Fire Protection (A LOOP)

S/RO	49.OP.3531.101	1	03/27/2013	Plant, RCA
Appl To	JPM Number	Revision	Date	Setting

295031	EA1.01	4.4/4.4	N	N
NUREG–1123 E/APE / Sys	K/A Number	K/A Importance	Faulted	Time Critical

Prepared

Tom Hooper	03/27/2013	30
Author	Date	Validation Time (min)

Validated

	3/28/2013	Approval	4/8/13
Operations Instructor	Date	Nuclear Trng Supv R. Snorra	Date

Examinee Name: ______________________ ______________

Last, First MI — Employee Number

Exam Date: ______________ Exam Duration (Min) ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator ______________________ ______________________

Name — Signature

Comments

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 49.OP.3531.101

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP–149–001, RHR SYSTEM

III. OPERATIONAL ACTIVITIES

None

IV. TASK CONDITIONS

A LOCA has occurred on Unit 1.

All control rods are fully inserted.

A Rapid Depressurization has taken place such that the reactor vessel is at 30 psig and stable.

RHR Pumps A and C have tripped. All RHR Loop A remotely operated valves may be operated from the Control Room.

The Unit Supervisor performing EO-100-102 and has determined that Fire Protection water needs to be cross tied to RHR 'A' Loop.

OP511, Diesel Engine Driven Fire Pump is in service.

V. INITIATING CUE

The FUS has instructed you to cross tie firewater to 'A' Loop of RHR.

VI. TASK STANDARD

Aligns firewater to inject to the RPV via 'A' Loop of RHR in accordance with OP-149-001.

VII. TASK SAFETY SIGNIFICANCE

Firewater provides an emergency source of injection into the RPV in order to prevent core uncovery and fuel damage.

Appl. To: S/RO JPM No.: 49.OP.3531.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
EVALUATOR NOTE • This JPM must be performed in the plant. • Obtain permission from Shift Manager to perform this JPM. This JPM requires access to Unit 1 RHR A room.				
1	**Verifies** OP–149–001 Step 2.13 is governing procedure and obtains controlled copy.	Controlled copy of OP–149–001 obtained, selects Step 2.13 to perform.		
	EVALUATOR CUE If asked provisions have been made to refill the fuel oil storage tanks.			
2	(Step 2.13.3) **Places** Diesel Engine Driven Fire Pump, 0P511, in service per OP–013–001.	From Task Conditions student notes that OP511 is in service.		
*3	(Step 2.13.5.a) **Closes** 151124 Fire Protection U1 RHR Emerg Crosstie Line Drn Vlv (25–683').	Simulates closing 151124 Fire Protection U1 RHR Emerg Crosstie Line Drn Vlv by rotating the valve handwheel in the clockwise direction until resistance is felt.		
	EVALUATOR CUE You feel resistance in the clockwise direction.			
*4	(Step 2.13.5.b) **Closes** 122503 Fire Protection U1 RHR Emerg Crosstie Line Vent Vlv (25–683').	Simulates closing 122503 Fire Protection U1 RHR Emerg Crosstie Line Vent Vlv by rotating the valve handwheel in the clockwise direction until resistance is felt.		
	EVALUATOR CUE You feel resistance in the clockwise direction.			

* = Critical Step
\# = Critical Sequence

Appl. To: S/RO JPM No.: 49.OP.3531.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
*5	(Step 2.13.5.c) **Closes** 151F088 RHR Cond Transfer Supply Keepfill PCV Bypass Vlv (25–690')	Simulates closing 151F088 RHR Cond Transfer Supply Keepfill PCV Bypass Vlv by rotating the valve handwheel in the clockwise direction until resistance is felt.		
	EVALUATOR CUE You feel resistance in the clockwise direction.			
*6	(Step 2.13.5.d) **Opens** 151121 Fire Protection U1 RHR Emerg Crosstie Line Iso Vlv (25–683').	Simulates opening 151121 Fire Protection U1 RHR Emerg Crosstie Line Iso Vlv by rotating the valve handwheel in the counter–clockwise direction until resistance is felt.		
	EVALUATOR CUE You feel resistance in the counter–clockwise direction.			
*7	(Step 2.13.5.e) **Opens** 122502 Fire Protection U1 RHR Emerg Crosstie Line Iso Vlv (25–683').	Simulates opening 122502 Fire Protection U1 RHR Emerg Crosstie Line Iso Vlv by rotating the valve handwheel in the counter–clockwise direction until resistance is felt.		
	EVALUATOR CUE You feel resistance in the counter–clockwise direction.			

* = Critical Step
\# = Critical Sequence

Appl. To: S/RO JPM No.: 49.OP.3531.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
8	(Step 2.13.5.f) **Ensures** 151F098 RHR Cond Transfer Supply Keepfill PCV Outlet Vlv (25–687') is OPEN.	Performs the following: • Simulates verifying 151F098 RHR Cond Transfer Supply Keepfill PCV Outlet Vlv is open by rotating the valve handwheel in the clockwise direction < 1 turn and feels no resistance. • Simulates opening 151F098 RHR Cond Transfer Supply Keepfill PCV Outlet Vlv by rotating the valve handwheel in the counter–clockwise direction until resistance is felt.		
	EVALUATOR CUE You feel no resistance in the clockwise direction. You feel resistance in the counter–clockwise direction.			
9	(Step 2.13.5.g) **Ensures** HV–151–F028A RHR Loop A Supp Cbr Spray Test Shutoff Vlv (27-708') is CLOSED.	Contacts Control Room operator to verify HV–151–F028A RHR Loop A Supp Cbr Spray Test Shutoff Vlv (27 683' I 204) is CLOSED.		
	EVALUATOR CUE (As Control Room PCO) HV–151–F028A is closed.			

* = Critical Step
\# = Critical Sequence

Appl. To: S/RO JPM No.: 49.OP.3531.101 Student Name: ____________

Step	Action	Standard	Eval	Comments
10	(Step 2.13.5.h) **Ensures** HV 151F015A RHR Loop A Injection OB Iso Vlv (29–710') is OPEN.	Contacts Control Room operator to verify HV-151F015A RHR Loop A Injection OB Iso Vlv is OPEN.		
	EVALUATOR CUE (As Control Room PCO) HV–151–F015A is open.			
11	(Step 2.13.5.i) **Informs** PCO that RPV injection flowpath is established from Fire Protection and continue with this procedure.	Informs PCO that RPV injection flowpath is established from Fire Protection and continue with this procedure.		
	EVALUATOR CUE (As Control Room PCO) I acknowledge RPV injection flowpath is established from Fire Protection.			
EVALUATOR CUE That completes the JPM.				
EVALUATOR: Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

TASK CONDITIONS

A LOCA has occurred on Unit 1.

All control rods are fully inserted.

A Rapid Depressurization has taken place such that the reactor vessel is at 30 psig and stable.

RHR Pumps A and C have tripped. All RHR Loop A remotely operated valves may be operated from the Control Room.

The Unit Supervisor performing EO-100-102 and has determined that Fire Protection water needs to be cross tied to RHR 'A' Loop.

OP511, Diesel Engine Driven Fire Pump is in service.

INITIATING CUE

The FUS has instructed you to cross tie firewater to 'A' Loop of RHR.

TASK CONDITIONS

A LOCA has occurred on Unit 1.

All control rods are fully inserted.

A Rapid Depressurization has taken place such that the reactor vessel is at 30 psig and stable.

RHR Pumps A and C have tripped. All RHR Loop A remotely operated valves may be operated from the Control Room.

The Unit Supervisor performing EO-100-102 and has determined that Fire Protection water needs to be cross tied to RHR 'A' Loop.

OP511, Diesel Engine Driven Fire Pump is in service.

INITIATING CUE

The FUS has instructed you to cross tie firewater to 'A' Loop of RHR.

Facility: Susquehanna Scenario No.: NRC-1 Op-Test No.: 2013

Examiners: ____________ Operators: ____________

Initial Conditions: The plant is operating at approximately 100% power. EHC pump A is out of service for maintenance. RCIC is out of service for maintenance.

Turnover: Transfer Bus 1A202 to the alternate supply per OP-104-001 section 2.1.4. Then lower Reactor power with Recirculation flow to approximately 92% per GO-100-012 section 5.3 and Reactivity Manipulation Package.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Transfer Bus 1A202 to the Alternate Supply OP-104-001
2	N/A	R – ATC, SRO	Lower Reactor Power with Recirculation Flow to 92% GO-100-012
3	cmfNB03_PSB 211N023A cmfRL02_C72 1K14A IMF cmfRL02_C72 1K14E	I – SRO	Division 1 RPS reactor pressure transmitter fails AR-103-001 (B02), Technical Specifications
4	mfFW145007A	C – All	Feedwater Pump A High Vibrations with Delayed Pump Trip AR-101-001 (A16), OP-145-001, ON-164-002
5	cmfRL02_E11 1K11A mfRH149004B	C – BOP, SRO	RHR Pump B Spurious Start and Suction Flange Leak into Reactor Building ON-169-002, EO-000-104, Technical Specifications
6	mfHP152009 mfHP152003	M – All	HPCI Steam Leak into Reactor Building EO-000-104, ON-100-101, EO-000-102
7	cmfMV06_HV 155F002 cmfMV06_HV 155F003 cmfMV09_HV 155F002 cmfMV09_HV 155F003	I – BOP, SRO	HPCI Fails to Automatically Isolate, HPCI Isolation Valves Stick Mid-Position When Manually Closed EO-000-104, EO-000-112
8	mfRD155006 cmfSC04	C – All	Multiple Control Rods Fail to Insert EO-000-102, EO-000-113

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

Facility: **Susquehanna**	Scenario No.: **NRC-1**	Op-Test No.: **2013**
1. Total malfunctions (5-8) **Events 4, 5, 6, 7, 8**	5	
2. Malfunctions after EOP entry (1-2) **Events 7 & 8**	2	
3. Abnormal events (2-4) **Events 4 & 5**	2	
4. Major transients (1-2) **Event 6**	1	
5. EOPs entered/requiring substantive actions (1-2) **EO-000-102, EO-000-104**	2	
6. EOP contingencies requiring substantive actions (0-2) **EO-000-112, EO-000-113**	2	
7. Critical tasks (2-3)	3	
CRITICAL TASK DESCRIPTIONS: **CT-1 – Manually scram the reactor when any Secondary Containment Area temperature approaches or exceeds Max Safe temperature.** **CT-2 – Rapidly depressurize the reactor when two Secondary Containment Areas exceed Max Safe Temperature levels.** **CT-3 – Insert control rods IAW EO-000-113, Sheet 2, Control Rod Insertion.**		

TEAM SUSQUEHANNA Generating Excellence	PPL–SUSQUEHANNA, LLC LEARNING CENTER SIMULATOR SCENARIO
Scenario Title:	**NRC 2013 Scenario #1**
Scenario Duration:	**1.5 hours**
Scenario Number:	**NRC 2013 Scenario #1**
Revision / Date:	**0 / April 02, 2013**
Course:	**Licensed Operator Initial**
Operational Activities:	

Prepared By:	Tom Hooper Instructor	04/02/2013 Date
Reviewed By:	R. Stoddard Operations Training Supervisor	4/8/13 Date
Approved By:	Donni S. Crawford Supervising Manager/Shift Manager	4/9/13 Date

TEAM SUSQUEHANNA Generating Excellence	PPL–SUSQUEHANNA, LLC LEARNING CENTER	
	SIMULATOR SCENARIO	
Scenario Title:	NRC 2013 Scenario #1	
Scenario Duration:	1.5 hours	
Scenario Number:	NRC 2013 Scenario #1	
Revision / Date:	0 / May 30, 2013	
Course:	Licensed Operator Initial	
Operational Activities:		
Prepared By:	Tom Hooper / Robert A. Thompson Instructor	05/30/2013 Date
Reviewed By:	R. Streeper Operations Training Supervisor	04/08/2013 Date
Approved By:	Lonnie L. Crawford, Jr. Supervising Manager/Shift Manager	04/08/2013 Date

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO SUMMARY

The crew assumes the shift with the plant operating at approximately 100% power. EHC pump A is out of service for maintenance. RCIC is out of service for maintenance.

The crew will begin by transferring Bus 1A202 to the alternate supply per OP-104-001 section 2.1.4. Then, the crew will lower Reactor power with Recirculation flow to approximately 92% per GO-100-012 section 5.3 and Reactivity Manipulation Package.

Once the Reactor power reduction is in progress or completed, a Division 1 RPS reactor pressure transmitter will drift high resulting in the alarm associated with a Division 1 RPS reactor scram signal. Division 1 RPS will fail to trip. The SRO should have SO–158–001 performed to demonstrate the operability of RPS trip channel A1, which will fail. The SRO will review Technical Specifications and determine the required actions for an inoperable RPS trip channel.

Next, Feedwater pump turbine A will develop high vibrations. The crew will respond per AR-016-001 (D07) and lower load on the Feedwater pump either manually or by lowering Reactor power. Vibrations will rise to 4.5 mils and then stabilize. The crew may trip the Feedwater pump as vibration levels approach the 5 mil automatic trip setpoint. If desired by lead examiner, Feedwater pump vibrations will rise again. Eventually, the Feedwater pump will automatically trip if the crew does not remove the pump from service. An automatic Recirc run back to the 48% limiter will be received. The crew will execute ON-164-002 due to lowering Recirculation flow. Reactor power will be approximately 65% following this transient.

Once the crew stabilizes the plant, RHR pump B will spuriously start. After a short delay, a leak will develop on the pump suction flange. RHR pump room water level will rise and Suppression Pool level will lower. The crew will secure the pump and isolate the leak by closing the suction valve. The crew will enter ON-169-002 due to flooding in the Reactor Building, EO-000-104 due to high Reactor Building area water level, and possibly EO-000-103 due to low Suppression Pool level. The SRO will review Technical Specifications and determine the impact.

Next, a steam leak will develop in the HPCI equipment room. HPCI will fail to automatically isolate. When the crew attempts to manually isolate the leak, both HPCI steam isolation valves will fail mid-position. The crew will re-enter EO-000-104, Secondary Containment Control. With an un-isolable primary system discharging into the Reactor Building and one area temperature approaching or exceeding the maximum safe value, the crew will insert a manual Reactor scram. Ten control rods will fail to insert on the scram. Five of these control rods will be able to be inserted using RMCS and five of these control rods will remain stuck for the rest of the scenario. The crew will enter EO-000-113, Level/Power Control, and take actions for the failure to scram. A second steam leak will develop from the HPCI steam isolation valves in the HPCI pipe routing area. This will lead to a second area temperature exceeding the maximum safe value. The crew will perform a rapid depressurization of the Reactor per EO-000-112.

The scenario will be terminated when the ADS valves are open, control rod insertion is in progress or completed for all rods that can be inserted, and Reactor water level is being controlled in the assigned band above -161".

The highest expected EAL classification at scenario termination is expected to be Site Area Emergency FS1, based on un-isolable primary system (HPCI) discharging outside primary containment reaching maximum safe temperatures.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO OBJECTIVES

The objective of this scenario is to evaluate the Licensed Operator Candidate's ability to respond to the scenario events. These events will require each candidate to demonstrate the following:

- Knowledge of integrated plant operations
- Ability to diagnose abnormal plant conditions
- Ability to work together as a team
- Ability to mitigate plant transients that exercise their knowledge and use of ONs and EOPs
- Ability to utilize Technical Specifications (SRO Only)

To meet this objective, the Licensed Operator Candidates must demonstrate proficiency in the following competencies:

Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings.
2. Comply with and use procedures, references, and Technical Specifications.
3. Operate the control boards.
4. Communicate and interact with other crew members.

Senior Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings.
2. Comply with and use procedures and references.
3. Operate the control boards (N/A to upgrade candidates).
4. Communicate and interact with the crew and other personnel.
5. Direct shift operations.
6. Comply with and use Technical Specifications.

THIS PAGE IS INTENTIONALLY LEFT BLANK

CRITICAL TASKS

1. Critical Task 1

Manually scram the reactor when any *Secondary Containment Area* temperature / radiation approaches or exceeds Max Safe Temperature.

Safety Significance

High-energy leakage into the Secondary Containment Area impacts the integrity of Secondary Containment. Failure of the Secondary Containment directly relates to the 10CFR50.67 design criteria of dose to the General Public.

Action is taken to isolate systems that are discharging into secondary containment to terminate possible sources of radioactivity release. If these efforts are unsuccessful, for whatever reason, or conditions are approaching or exceeding max safe thresholds, the reactor (source term) is placed in a low energy state, or shutdown.

Consequences for Failure to Perform Task

Failure to take actions to mitigate the energy released to the secondary containment directly affects the radiation dose to the General Public.

SSES EOP Basis for:

SC/T-8 **BEFORE** ANY RB AREA TEMP REACHES MAX SAFE

GO TO RPV CONTROL

Areas monitored by steam leak detection (RWCU equipment, main steam line tunnel, HPCI and RCIC pipe routing, HPCI equipment, and RCIC equipment) are assigned a Max Safe temperature equal to the steam leak detection isolation setpoint. "The setpoints are designed to detect a leakage rate below the leak rate corresponding to critical crack size for the smallest high energy line in the room which is part of the respective system." (FSAR 5.2.5.1.3). Instrumentation and components required for isolation are qualified up to the isolation temperature setpoints.

(Reference: SSES-EPG SC/T-4.1)

SC/R-5 **BEFORE** ANY RB AREA RAD REACHES MAX SAFE

GO TO RPV CONTROL

The Max Safe operating radiation level is the most limiting area radiation level which will ensure personnel exposure is kept below the emergency exposure limit (25 Rem) while performing EOP actions in the secondary containment for a period no longer than 2.5 hours (i.e., 25 Rem/2.5 hr = 10 Rem/hr).

A reactor scram through entry to EO-000-102, RPV Control, promptly reduces to decay heat levels the energy that the RPV may be discharging to the secondary containment. The instruction to take this action at any time between the Max Normal and the Max Safe operating value may help avoid reaching the more severe action of rapidly depressurizing the RPV.

(Reference: SSES-EPG SC/R-2.1)

Indications/Cues for Event Requiring Critical Task

Simplex Fire Detection alarms indicating High temperatures in RB Areas
Increasing area radiation and alarms for RB Areas
Increasing Steam Leak Detection System temperatures and alarms

Performance Criteria

Manually Scram the Reactor when approaching or exceeding any Max Safe Temperature/Radiation as indicated by associated control room alarms and PICSY radiation indications.

Performance Feedback

Initiating a reactor scram reduces the heat load that will be absorbed and released by the Secondary Containment as well as the radioactive source term.

Rods inserted
Power lowering

2. Critical Task 2

Rapidly depressurize the reactor when two Secondary Containment Areas exceed Max Safe Rad / Temperature / Water levels.

Safety Significance

High-energy leak in the Secondary Containment Area impacts the integrity of Secondary Containment. Failure of the Secondary Containment directly relates to the 10CFR50.67 design criteria of dose to the General Public.

Action is taken to isolate systems that are discharging into secondary containment to terminate possible sources of radioactivity release. Minimizing radioactive release to secondary containment also helps accomplish the objective of precluding a radioactive release outside secondary containment under conditions where secondary containment integrity cannot be maintained. Previous containment control actions have not, for whatever reason, mitigated the event and now potentially large areas of the secondary containment have been challenged.

Consequences for Failure to Perform Task

Failure to take actions to mitigate the energy released to the secondary containment directly affects the radiation dose to the General Public.

SSES EOP Basis for:

SC/T-9 **WHEN** RB AREA TEMP EXCEEDS MAX SAFE
IN **2** OR MORE AREAS

RAPID DEPRESS IS REQ'D

SC/R-6 **WHEN** RB AREA RAD EXCEEDS MAX SAFE
IN **2** OR MORE AREAS

RAPID DEPRESS IS REQ'D

SC/L-7 **WHEN** RB AREA WATER LEVEL EXCEEDS MAX SAFE
IN **2** OR MORE AREAS

RAPID DEPRESS IS REQ'D

Should secondary containment area temperatures/radiation/water levels continue to increase to their Max Safe values in more than one area with a primary system discharging into secondary containment, the RPV must be rapidly depressurized. Depressurizing the RPV promptly places the primary system in its lowest possible energy state, rejects heat to the suppression pool in preference to outside the containment, and reduces the driving head and flow of primary systems that are un-isolated and discharging into the secondary containment.

The criteria of "2 or more areas" identifies the increase in temperature (radiation or water level) trend as a wide spread problem which may pose a direct and immediate threat to secondary containment integrity, equipment located in the secondary containment, or continued safe operation of the plant.

Indications/Cues for Event Requiring Critical Task

Increasing Steam Leak Detection System temperatures and alarms indicating levels at Max Safe values.
Increasing area radiation and alarms for RB Areas indicating levels at Max Safe values.
PICSY formats indicating radiation values greater than Max Safer values.
Reactor Building room levels above high level annunciation or as confirmed by local evaluation.

Performance Criteria

Perform a Rapid Depressurization per EO-100-112 when two or more RB areas exceed max safe temperatures per EO-100-104 Table 8
Perform a Rapid Depressurization per EO-100-112 when two or more RB areas exceed max safe radiation per EO-100-104 Table 9 (10 R/hr for all areas)
Perform a Rapid Depressurization per EO-100-112 when two or more RB areas exceed max safe water level per EO-100-104 Table 10

Initiate ADS / Manually open all 6 ADS valves

Performance Feedback

Initiating a rapid depressurization causes Reactor pressure to lower which lowers the driving force of any primary system breach.

Verify ADS valves are open using red light indication, acoustic monitoring and lowering Reactor pressure and rising reactor water level.

3. Critical Task 3

Insert control rods IAW EO-100-113 Sht. 2.

Safety Significance

Control rod insertion initiates power reduction immediately

Consequences for Failure to Perform Task

Failure to insert control rods allows power to remain elevated with resultant power oscillations and potential core damage.

Indications/Cues for Event Requiring Critical Task

Exceeding a RPS scram setting with NO reactor scram signal, or RPS/ARI fail to fully insert all control rods.

Performance Criteria

Insert Control Rods by one or more of the following methods:
Maximize CRD to drift control rods.
Drive control rods after bypassing RWM and RSCS.
Reset and Scram again by performing ES-158-002 Bypass RPS logic trips.
De-energizing RPS solenoids by performing ES-158-001.
Local venting of Scram Air Header.

Performance Feedback

Successful insertion of control rods will be indicated by:

- Rod position full in indication for manual insertion of control rods, venting scram air header or de-energizing RPS solenoids.
- Rod position full in after resetting scram, draining scram discharge volume and re-scram.
-

- **THIS PAGE IS INTENTIONALLY LEFT BLANK**

SCENARIO MALFUNCTIONS

Malfunction	Description	Crew Response
1	Div 1 RPS reactor pressure transmitter fails, RPS A1 trip channel fails to trip	Determine Technical Specification impact
2	Feedwater Pump A High Vibrations with Delayed Pump Trip	Lower Feedwater pump load, lower Reactor power, secure Feedwater pump or respond to pump trip, respond to Recirc pump runback
3	RHR Pump B Spurious Start and Suction Flange Leak into Reactor Building	Secure RHR pump, close RHR pump suction valve, declare RHR pump inoperable
4	HPCI Steam Leak into Reactor Building	Scram the Reactor, rapidly depressurize the Reactor
5	HPCI Fails to Automatically Isolate, HPCI Isolation Valves Stick Mid-Position When Manually Closed	Attempt to manually close HPCI isolation valves, recognize HPCI isolation valves stuck mid-position, rapidly depressurize the Reactor
6	Multiple Control Rods Fail to Insert	Insert some control rods with RMCS, recognize some control rods will not insert, terminate and prevent injection prior to rapid depressurization

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO REFERENCES

1.	OP-104-001	4 KV ELECTRICAL SYSTEM
2.	GO-100-012	POWER MANEUVERS
3.	OP-164-002	REACTOR RECIRCULATION SYSTEM HMI OPERATIONS
4.	AR-103-001 (B02)	RX VESSEL HI PRESS TRIP
5.	SO-158-001	WEEKLY MANUAL SCRAM CONTROL SWITCH FUNCTIONAL CHECK
6.	TS 3.3.1.1	REACTOR PROTECTION SYSTEM INSTRUMENTATION
7.	AR-101-001 (A16)	RFPT – RFP A / B / C HI VIBRATION
8.	OP-145-006	FEEDWATER SYSTEM HMI OPERATIONS
9.	OP-145-001	RFP AND RFP LUBE OIL SYSTEM
10.	ON-164-002	LOSS OF REACTOR RECIRCULATION FLOW
11.	AR-110-001 (C03)	RHR/CORE SPRAY LOOP B OPERATING ADS PERMISSIVE
12.	AR-113-001 (H08)	RHR LOOP B PUMP ROOM FLOODED
13.	TS 3.5.1	ECCS - OPERATING
14.	ON-169-002	FLOODING IN REACTOR BUILDING
15.	EO-000-103	PRIMARY CONTAINMENT CONTROL
16.	EO-100-104	SECONDARY CONTAINMENT CONTROL
17.	AR-114-001 (E05)	HPCI LEAK DETECTION HI TEMP/HI DIFF TEMP
18.	EO-100-102	RPV CONTROL
19.	EO-100-113	LEVEL/POWER CONTROL
20.	EO-100-112	RAPID DEPRESSURIZATION
21.	OP-155-001	CONTROL ROD DRIVE HYDRAULIC SYSTEM
22.	OP-149-001	RHR SYSTEM
23.	OP-151-001	CORE SPRAY SYSTEM

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO SPECIAL INSTRUCTIONS

1. Simulator setup
   a. **Initialize** to IC–376
   b. **Run** SCN file **n13scen1.scn**
2. **Place** the simulator in RUN
3. **Verify** the following malfunctions/overrides, event triggers and key assignments:

MF	RF	OR	SCN	ET	CONDITIONS	KEYS
15:15	**1:1**	**1:1**	**0**	**2:0**	**11**	**9**

4. **Prepare** the simulator for evaluation
   a. **Complete** a simulator exam checklist, NTP–QA–31.10 Attachment B
   b. **Place** a tag on EHC pump 1A HS.
   c. **Place** tags on RCIC.
   d. **Prepare** a Reactivity Manipulation Package for lowering Reactor power from 100% to 92% with recirculation flow.
5. **Prepare** a Turnover Sheet including the following:
   a. Transfer Bus 1A202 to the alternate supply per OP-104-001 section 2.1.4.
   b. Then lower Reactor power with Recirculation flow to approximately 92% per GO-100-012 section 5.3 and Reactivity Manipulation Package.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO FILES

n13scen1.scn

```
; Monitored parameters
SCN rat_mp
SCN n13scen1mp

; EHC Pump A OOS
IRF crfPM10_1P113A f:OUT

; RCIC OOS
IMF mfRC150011

; Crew swaps Bus 1A202 from normal to alternate supply

; Crew lowers power to 95% with recirc flow

; RPS rx pressure transmitter B fails high with auto-scram failure
{Key[1]} IMF cmfNB03_PSB211N023A d:1 f:0
{Key[1]} IMF cmfRL02_C721K14A
{Key[1]} IMF cmfRL02_C721K14E

; CST A level instrument fails high
;{Key[1]} IMF cmfTR02_LT00812A f:100
;{Key[1]} IMF annAR016D07 f:ALARM_ON

; SLC squib A failure
;{Key[1]} IMF annAR107A03 f:ALARM_ON
;{Key[1]} IOR doC41DS3A f:OFF

; Feedwater pump A high vibrations
{Key[2]} IMF mfFW145007A i:2.5 r:25:00 f:8

; Stops rise in FWP A vibes if they reach 4.5 mils
aet n13scen1et3

; May make FW pump vibes worse if needed/when directed
{Key[12]} IMF mfFW145007A r:1:00 f:10

; RHR pump B spurious start and suction leak
{Key[3]} IMF cmfRL02_E111K11A
{Key[3]} IMF mfRH149004B d:1:00 r:2:00 f:40

; May open room drain valve
{Key[13]} IRF rfLD120005 f:OPEN

; RHR Pump 1B ctrl power DC knife
{Key[23]} IMF cmfPM01_1P202B

; HPCI leak into RB (HPCI equipment room)
{Key[4]} IMF mfHP152009 f:0.5

; Ramps up HPCI leak into equipment room
{Key[14]} MMF mfHP152009 f:4 r:1:00

; HPCI leak into RB (pipe tunnel)
; activates when either HPCI steam inlet valve HS is taken to close
; and mode switch is in shutdown
aet n13scen1et1

; HPCI fails to isolate automatically and steam inlet valves fail mid-position
; when manually closed
IMF cmfMV06_HV155F003
IMF cmfMV09_HV155F003 f:50
IMF cmfMV06_HV155F002
IMF cmfMV09_HV155F002 f:50

; Multiple control rods fail to insert on scram but may be manually driven
IMF cmfSC04_HCU1823 f:0
IMF cmfSC04_HCU3415 f:0
IMF cmfSC04_HCU3427 f:0
IMF cmfSC04_HCU4223 f:0
IMF cmfSC04_HCU5031 f:0
```

```
Multiple control rods fail to insert on scram and will not drive manually
IMF mfRD1550061027 f:AsIs
IMF mfRD1550061443 f:AsIs
IMF mfRD1550062207 f:AsIs
IMF mfRD1550062635 f:AsIs
IMF mfRD1550063443 f:AsIs

; Operator may close CRD charging water isolation valve
{Key[5]} IRF rfRD155017 f:0

; open ADS SRVs from lower relay room
{Key[6]} SCN n13scen1_1
```

n13scen1_1.scn

```
;# FILE: ADB.ADSKEYS
;# NAME: GREGG LUDLAM
;# SCENARIO: ANY REQUIRING ADS KEY-LOCKED OPEN IN RELAY ROOM
;# REVISION/DATE: 0, 9/21/93
;# DESCRIPTION: PERFORMS OVERRIDES FOR 6 ADS VLVS IN LRR (DIV 2) TO
;# KEYLOCK THEM OPEN.
;# END
IOR diHS14113G2 f:OPEN
IOR diHS14113J2 d:6 f:OPEN
IOR diHS14113K2 d:12 f:OPEN
IOR diHS14113L2 d:18 f:OPEN
IOR diHS14113M2 d:24 f:OPEN
IOR diHS14113N2 d:30 f:OPEN
```

n13scen1mp.scn

```
insmp ycpxebe42
changemp ycpxebe42 ,,,ESS Bus 1B Volts

insmp ldtee41n24b
changemp ldtee41n24b ,,,HPCI Equip Room Temp

insmp ldtee51n25c
changemp ldtee51n25c ,,,HPCI Pipe Tunnel Temp

insmp ycpxftv01
changemp ycpxftv01 ,,,RFPT A VIBR X
```

n13scen1et1.et

```
; SWITCH: HPCI STEAM SUPPLY OB ISO
diHS15503.CurrValue = #OR.diHS15503.CLS |
diHS15502.CurrValue = #OR.diHS15502.CLS
```

n13scen1et1.scn

```
IMF mfHP152003 d:10:00 r:2:00 f:1
```

n13scen1et3.et

```
;adjust rfpt a vibra on hi vib
ycpxftv01 > 4.5
```

n13scen1et3.scn

```
MMF mfFW145007A r:0 f:AsIs
```

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT DESCRIPTION FORM

Initial Conditions: Ensure shift positions are assigned, have the Crew conduct the turnover and perform a panel walk down before the start of the scenario.

EVENT	OP EVENT / TASK	TIME	DESCRIPTION
N/A	N/A	0	Crew assumes shift
1	N/A	5	Transfer Bus 1A202 to the Alternate Supply
2	N/A	15	Lower Reactor Power with Recirculation Flow to 92%
3	N/A	25	Div 1 RPS reactor pressure input fails, RPS A1 fails to trip
4	N/A	35	Feedwater Pump A High Vibrations with Delayed Pump Trip
5	N/A	50	RHR Pump B Spurious Start and Suction Flange Leak into Reactor Building
6	N/A	60	HPCI Steam Leak into Reactor Building
7	N/A	60	HPCI Fails to Automatically Isolate, HPCI Isolation Valves Stick Mid-Position When Manually Closed
8	N/A	65	Multiple Control Rods Fail to Insert
N/A	N/A	90	Termination

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT FORM

EVENT	1
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Transfer Bus 1A202 to the Alternate Supply

POSITION	TIME	STUDENT ACTIVITIES
SRO		Directs BOP to transfer Bus 1A202 from the normal supply to the alternate supply per OP-104-001 section 2.1.4.
ATC		Monitors plant parameters.
BOP		Transfers Bus 1A202 from the normal supply to the alternate supply per OP-104-001 section 2.1.4: • Ensure SU Bus 10 Xfmr 111 bkr 0A10312 CLOSED. • Observe ESS Transformer 111(0X211) secondary supply line voltage on Voltmeter XI 00040 is nominally 4200V. • Ensure loads to be picked up by ESS Transformer 111(0X211) will not overload Transformer 111(0X211). • Insert key and Place Xfmr 111 Bus 1B Sync Sel keyswitch to ON. • Check two voltages MATCHED by Observing Diff AC Volts XI 00036 on red scale reads less than 297 volts. • Check two sources IN PHASE by Observing Synchroscope XI 00037 is at 12 o'clock position. • Close Xfmr 111 to Bus 1B Bkr 1A20201 by Placing switch to CLOSE. (Note: Alarm AR-015-D13 is expected.) • Observe Xfmr 111 to Bus 1B Bkr 1A20201 CLOSES. • When Xfmr 111 to Bus 1B Bkr 1A20201 CLOSES, Observe Xfmr 211 to Bus 1B Bkr 1A20209 AUTOMATICALLY OPENS. • Observe voltage indication on ESS BUS 1B (1A202). (PICSY Display 4KV) • Dispatch operator to check all 3 phase voltages at 1A20204. • Ensure ESS Transformer 111(0X211) not overloaded by monitoring ESS Xfmr 111(0X211) current indication. • Return Xfmr 111 Bus 1B Sync Sel keyswitch to OFF and Remove key. • Align all control switch flags to actual breaker positions.

NOTES	

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	1
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Transfer Bus 1A202 to the Alternate Supply

INSTRUCTOR ACTIVITY

1. None

ROLE PLAY

If asked as **NPO** before the breaker swap, immediately report that the area is clear of unnecessary personnel and you are ready for the swap.

If asked as **NPO** after the breaker swap to check Bus 1A202, immediately report that everything looks good at Bus 1A202.

If asked as **NPO** after the breaker swap to check phase voltages, immediately report that all three phase voltages indicate normal at 1A20204 (OP-104-001 step 2.1.4.k).

Role play any other directed actions as required.

EVALUATOR NOTES

1. None

SCENARIO EVENT FORM

EVENT	2
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Lower Reactor Power with Recirculation Flow to 92%

POSITION	TIME	STUDENT ACTIVITIES
SRO		Directs ATC to lower Reactor power to 92% (~1250 MWe) with recirculation flow per GO-100-012 and the Reactivity Manipulation Package. Provides oversight for reactivity manipulation.
ATC		Lowers recirculation flow by controlling both Reactor Recirc Pumps in MANUAL mode: <u>MANUAL mode:</u> • Slowly Adjust REACTOR RECIRC PUMP A(B) SPEED SY-B31-1R621A(B) Controller Demand with the applicable DEC pushbuttons as required. Monitors diverse indications: • APRMs, Core thermal power • Main Generator output (~1250 MWe ≈ 92% CTP) • Reactor water level, Reactor pressure • Recirc pump speeds, Recirc pump flows, Total core flow Plots all Reactor power changes on Power/Flow Map.
BOP		May contact GCC prior to start of power reduction. Peer checks reactivity manipulations. Monitors plant parameters.

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	2
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Lower Reactor Power with Recirculation Flow to 92%

INSTRUCTOR ACTIVITY

1. None

ROLE PLAY

When contacted as **GCC** (Lou Spinelli) concerning power reduction, acknowledge communication.

Role play any directed actions as required.

EVALUATOR NOTES

1. Recirculation Loop Jet Pump mismatch shall be maintained ≤ 5 million lbm/hr when operating at ≥ 75 million lbm/hr total core flow.
2. It is permissible for the crew to control one Recirc Pump in POWER MANEUVERING MODE, however it is most likely that they will control both in MANUAL MODE.
3. Once a sufficient power change has been observed, proceed to the next event.

SCENARIO EVENT FORM

EVENT	3
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Div 1 RPS reactor pressure input fails, RPS A1 fails to trip

POSITION	TIME	STUDENT ACTIVITIES
Team		Recognizes / reports: • Annunciator AR-103-001 (B02), RX VESSEL HI PRESS TRIP • Division 1 RPS fails to trip
SRO		Ensures execution of AR-103-001 (B02). May direct performance of SO–158–001, WEEKLY MANUAL SCRAM CONTROL SWITCH FUNCTIONAL CHECK, to determine extent of RPS malfunction. Declares RPS A1 trip channel inoperable. Determines Technical Specification 3.3.1.1 Condition A requires placing RPS channel A1 in trip within 12 hours
ATC		Executes AR-103-001 (B02). Performs SO–158–001 if directed, for each RPS trip channel (A1, A2, B1, B2) as follows • PLACE RPS MAN SCRAM CHAN A1(A2)(B1)(B2) HS-C72A-1S03A(C)(B)(D) control switch to ARMED • DEPRESS RPS MAN SCRAM CHAN A1 HS-C72A-1S03A(C)(B)(D) control switch. • Observes AR103(104)–A01, RPS CHANNEL A1/A2 AUTO SCRAM and AR103(104)–F01, RPS CHANNEL A1/A2(B1/B2) MAN SCRAM in alarm • PLACE RPS MAN SCRAM CHAN A1(A2)(B1)(B2) HS-C72A-1S03A(C)(B)(D) switch to DISARMED • RESET RPS A(B) half scram as follows by Momentarily PLACE REACTOR SCRAM RESET HS C72A 1S05 switch to GROUP 1/4 position then momentarily PLACE REACTOR SCRAM RESET HS C72A 1S05 switch to GROUP 2/3 position
BOP		Monitors plant parameters.

NOTES	

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	3
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Div 1 RPS reactor pressure input fails, RPS A1 fails to trip

INSTRUCTOR ACTIVITY

1. When crew completes power reduction to 92% or when directed by lead examiner, **depress KEY 1** to initiate event:

{Key[1]} IMF cmfNB03_PSB211N023A d:1 f:0
{Key[1]} IMF cmfRL02_C721K14A
{Key[1]} IMF cmfRL02_C721K14E

ROLE PLAY

As **NPO** dispatched to investigate RPS relays in the relay room, wait 2 minutes and report:

RPS relay C72–K5A is tripped, but no other RPS relays are tripped.

As **NPO** dispatched to investigate PS–B21–1N023A(C) at the C005 rack, wait 2 minutes and report:

GVI of the C005 rack is satisfactory.1N023A(C) are pressure switches with no associated indication.

As **WWM** (or equivalent) contacted for assistance with troubleshooting/repairing RPS trip channel A1, acknowledge request and report that you will contact FIN and inform Operations Management.

Role play any other directed actions as required.

EVALUATOR NOTES

1. None

SCENARIO EVENT FORM

EVENT	4
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Feedwater Pump A High Vibrations with Delayed Pump Trip

POSITION	TIME	STUDENT ACTIVITIES
Team		Recognizes / reports: • Annunciator AR-101-001 (A16), RFPT – RFP A / B / C HI VIBRATION • RFPT A vibrations rising
SRO		Ensures execution of AR-101-001 (A16). May direct rapidly lowering Reactor power by any of the following (Note: OP-AD-004 may be referenced for such guidance): • Manual Recirculation flow reduction. • Inserting LIM 2 runback. • Inserting control rods per shutdown sequence. May direct trip of RFPT A. Enters ON-164-002 due to Recirc runback. May enter ON-145-001, RPV Level Control System Malfunction.
ATC		Executes AR-101-001 (A16): • Check alarm condition and trend on RFPT VIBRATION XRSH 12728. • May reduce load (Turbine speed) on RFPT 1A to determine if Turbine vibration condition is load related. • IF turbine vibration increases to 5 mils, THEN Ensure RFPT trips. • Check oil temperature May reduce load on RFPT 1A per OP-145-005 section 2.6.3: • Place RFP A SPD CTL/DEMAND SIGNAL SIC-C32-1R601A controller in MANUAL. • Adjust RFP A SPD CTL/DEMAND SIGNAL SIC-C32-1R601A using INC/DEC buttons as necessary to control RPV Water as desired. May rapidly lower Reactor power by any of the following: • Manual Recirculation flow reduction. • Inserting LIM 2 runback. • Inserting control rods per shutdown sequence.

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	4
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Feedwater Pump A High Vibrations with Delayed Pump Trip

INSTRUCTOR ACTIVITY

1. When directed by lead examiner, **depress KEY 2** to initiate event.

   {Key[2]} IMF mfFW145007A i:2.5 r:25:00 f:8

2. If/when RFPT A vibrations rise to 4.5 mils, ensure **n13scen1et3** automatically initiates and **modifies mfFW145007A as-is.**

3. If candidates place RFPT A in idle mode or directed by lead examiner, **depress KEY 12** to cause vibrations to exceed trip level.

   {Key[12]} IMF mfFW145007A r:1:00 f:10

ROLE PLAY

If contacted as **GCC** (Lou Spinelli) regarding power reduction, ask what the expected final power level will be.

As **NPO** dispatched to RFPT A, wait 2 minutes and **report,**

> **"Noise levels from RFPT A are much higher than normal and the whole area is vibrating. It appears that the vibrations have caused a small lube oil leak."**
>
> If desired to drive crew action and directed by lead examiner, **report**,
>
> **"The lube oil leak from RFPT A is getting worse."**

As **WWM** (or equivalent) contacted for assistance with RFPT A, acknowledge request.

Role play any other directed actions as required.

EVALUATOR NOTES

1. The crew may reduce load on RFPT A either by taking manual control or by reducing overall Reactor power.
2. The RFPT A vibrations will initially stabilize at approximately 4.5 mils.
3. If the crew does not take action, Key 12 will be directed by lead examiner to force the scenario to proceed. RFPT A will trip on a high turbine vibration of 5 mils 1-2 minutes after Key 12 initiation if the crew does not remove it from service earlier.
4. If the crew does not take action earlier and Key 12 is inserted to force scenario to proceed, Recirculation pumps will runback to the 48% limiter due to trip of RFPT A.
5. Recommend proceeding to the next event once Reactor power has stabilized and the crew has performed initial actions in ON-164-002 for Recirculation runback.

SCENARIO EVENT FORM

EVENT	4
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Feedwater Pump A High Vibrations with Delayed Pump Trip

POSITION	TIME	STUDENT ACTIVITIES
ATC (cont)		May trip RFPT A per OP-145-001 section 2.24: ▪ IF desired Trip RFPT A from 1C651 panel, Depress RFPT A TRIP HS 12745A pushbutton. ▪ IF desired to Trip RFPT A from an ICS HMI screen, Perform following on RFP A HMI screen: o Touch A RFPT RESET Button. o Touch TRIP button on RFPT A TRIP RESET HS 12745A2. o Touch ENABLE TRIP A RFPT button on confirmation overlay screen. o Touch TRIP A RFPT button on confirmation overlay screen within 15 seconds. Executes ON-164-002 actions for Recirc runback: ▪ Plot position on Power/Flow Map. ▪ Ensure a Non Peripheral Control Rod selected. ▪ Monitor LPRMs for Limit Cycle Oscillations. ▪ Perform appropriate action specified in ON-178-002. ▪ Perform appropriate actions specified in ON-156-001. ▪ Determine which Limiter initiated runback on any Rx Recirc HMI screen by observing: o Speed Limiter #1 (30%) Initiated status block blinks red. o Speed Limiter #2 (48%) Initiated status block blinks red. ▪ Ensure the Rx Recirc Pumps run back to value associated with controlling limiter. ▪ Ensure the associated SY-B31-1R621A(B) controller(s) have transferred to Manual as appropriate.
BOP		Monitors plant parameters.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT FORM

EVENT	5
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	RHR Pump B Spurious Start and Suction Flange Leak into Reactor Building

POSITION	TIME	STUDENT ACTIVITIES
Team		Recognizes / reports: • Annunciator AR-110-001 (C03), RHR/CORE SPRAY LOOP B OPERATING ADS PERMISSIVE • RHR pump B is running • Annunciator AR-113-001 (H08), RHR LOOP B PUMP ROOM FLOODED • Suppression Pool level is lowering
SRO		Ensures execution of AR-110-001 (C03) and AR-113-001 (H08). Determines RHR pump B operation is not required. Directs BOP to stop RHR pump B. Enters EO-000-104, Secondary Containment Control, on high RB area water level. Enters ON-169-002, Flooding in Reactor Building. Directs BOP to close RHR pump B suction valve. Directs start of ESW and Unit Coolers. If Suppression Pool level lowers to 22', enters EO-000-103, Primary Containment Control. May direct makeup to the Suppression Pool using Suppression Pool Cleanup per OP-159-001 section 2.4. Declares RHR pump B inoperable. Determines Technical Specification 3.5.1 Condition B applies which requires restoration of RHR pump B within 7 days. If Suppression Pool level lowers below 22 feet, determines Technical Specification 3.6.2.2 Condition A requires restoring level within 2 hours. May reference RHRSW Technical Specification.
ATC		Monitors plant parameters.
BOP		Stops RHR pump B by placing 1P202B to STOP. Closes RHR pump B suction valve by placing HV-151-F004B to CLOSE. Starts ESW and Unit Coolers.

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	5
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	RHR Pump B Spurious Start and Suction Flange Leak into Reactor Building

INSTRUCTOR ACTIVITY

1. When directed by the lead examiner, **depress KEY 3** to initiate event.

   {Key[3]} IMF cmfRL02_E111K11A
   {Key[3]} IMF mfRH149004B d:1:00 r:2:00 f:40

2. If directed to open RHR pump room B drain valve, wait 2 minutes and **depress KEY 13** and report completion.

   {Key[13]} IRF rfLD120005 f:OPEN

3. If directed to open RHR B DC knife switch, wait 2 minutes and **depress KEY 23** and report completion.

   {Key[23]} IMF cmfPM01_1P202B

ROLE PLAY

As **NPO** dispatched to RHR pump B, wait 2 minutes and **report** the pump and leak status based on current plant condition. If the leak is still un-isolated, **report** at a minimum,

> **"I can hear water flow from behind the RHR pump room door and there is a small amount of leakage coming from the door. I have not attempted to open the door due to the leakage."**

As **NPO** dispatched to investigate if RHR leak has been isolated, **report** that the leak noise has stopped and leakage from RHR pump room B watertight door is slowing.

If dispatched as **NPO** ensure closed water tight doors, wait 2 minutes and **report** that all water tight doors on elevation 645' are closed.

If asked as **Radwaste** about capacity to take on water, **report** that you have room for water and will closely monitor tank levels.

If dispatched as **NPO** open RHR pump room B drain valve (161121), wait 2 minutes and **depress KEY 13,** as described above, and **report** the valve is open.

If directed to open RHR B DC knife switch, wait 2 minutes and **depress KEY 23**, as described above, and report completion.

As **WWM** (or equivalent) contacted for assistance with RHR pump B, acknowledge request.

Role play any other directed actions as required.

EVALUATOR NOTES

1. None

SCENARIO EVENT FORM

EVENTS	6, 7, & 8
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	HPCI Steam Leak into Reactor Building, HPCI Fails to Automatically Isolate, HPCI Isolation Valves Stick Mid-Position When Manually Closed, Multiple Control Rods Fail to Insert

POSITION	TIME	STUDENT ACTIVITIES
★		**Manually scram the reactor when any Secondary Containment Area temperature / radiation approaches or exceeds Max Safe Temperature.** **Rapidly depressurize the reactor when two Secondary Containment Areas exceed Max Safe Rad / Temperature / Water levels.**
TEAM		Recognizes / reports: • Annunciator AR-114-001 (E05), HPCI LEAK DETECTION HI TEMP/HI DIFF TEMP • Annunciator AR-016-001 (G15), FIRE PROTECTION PANEL 0C650 SYSTEM TROUBLE • Elevated temperatures in the HPCI equipment area on recorder 1R604 and Riley Tempmatic readings at 1C614.
SRO		Re-enters EO-100-104, SECONDARY CONTAINMENT CONTROL, based on HPCI equipment area temperature: • Directs starting ESW, all individual Room Coolers. • Directs manual isolation of HPCI. May direct scram-imminent actions, if time permits. Enters EO-000-102, RPV CONTROL, after determining that a primary system is discharging into an area and cannot be isolated: • **Directs Mode Switch to SHUTDOWN when Pipe Routing Area approaches or exceeds Maximum Safe temperature.** • Acknowledges multiple control rods fail to insert. • Answers, “Is more than 1 control rod >00?” Yes.

★ Denotes Critical Task

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENTS	6, 7, & 8
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	HPCI Steam Leak into Reactor Building, HPCI Fails to Automatically Isolate, HPCI Isolation Valves Stick Mid-Position When Manually Closed, Multiple Control Rods Fail to Insert

INSTRUCTOR ACTIVITY

1. When directed by lead examiner, **depress KEY 4** to initiate event:
   {Key[4]} IMF mfHP152009 f:0.5

2. Once the crew has diagnosed HPCI steam leak and directed by lead examiner, **depress KEY 14** to ramp up leak:
   {Key[14]} MMF mfHP152009 f:4 r:1:00

3. When either HPCI steam isolation valve HS is taken to close and the mode switch is in shutdown, **ensure mfHP152003 initiates** to start a delayed steam leak in the HPCI pipe routing area **(aet n13scen1et1)**.

4. If dispatched to close CRD charging water header isolation valve (HV-146-F034), wait 2 minutes, then **depress KEY 5** and report completion:
   {Key[5]} IRF rfRD155017 f:0

5. If dispatched to open ADS valves from lower relay room, wait 2 minutes, then **depress KEY 6** and report completion:
   {Key[6]} SCN n13scen1_1

ROLE PLAY

As **NPO** dispatched to investigate HPCI, wait 2 minutes and report:
"There is some steam coming from the HPCI equipment room. I can hear a hissing noise from the HPCI equipment room. The door to the room is very warm."

If dispatched to close HPCI outboard steam isolation valve (HV-155-F003), wait 5 minutes and then report you cannot access the valve due to steam in the area (if second leak is active) or you cannot operate the valve (if second leak is not yet active).

Role play any other directed actions as required.

EVALUATOR NOTES

1. Once the crew attempts to manually isolate HPCI and the mode switch is placed in shutdown, a second steam leak will occur in the HPCI pipe routing area where the isolation valves are located. This will drive a second area temperature to exceed maximum safe and require a rapid depressurization.
2. Due to the quick rise in HPCI equipment room temperature, the crew may not scram the Reactor prior to exceeding the maximum safe temperature of 167°F. In this case, the crew should take prompt action to scram the Reactor once the HPCI equipment room temperature exceeds 167°F.
3. Five of the ten control rods that failed to scram may be inserted with RMCS.
4. With RHR and Core Spray not running, the SRO may not direct starting and terminating these systems during the emergency depressurization.
5. Recommended termination criteria:
   - ADS valves open.
   - Control rod insertion in progress or completed (5 of 10 rods).
   - Reactor water level controlled in assigned band above -161".

SCENARIO EVENT FORM

EVENTS	6, 7, & 8
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	HPCI Steam Leak into Reactor Building, HPCI Fails to Automatically Isolate, HPCI Isolation Valves Stick Mid-Position When Manually Closed, Multiple Control Rods Fail to Insert

POSITION	TIME	STUDENT ACTIVITIES

SRO (cont)		Exits EO-000-102 and enters EO-000-113, Level/Power Control:
		• Executes Power Leg:
		  o Ensures ARI initiated.
		  o Records initial ATWS power level.
		  o Answers, "Is initial ATWS pwr >5% or cannot be determined?" No.
		  o Ensures SRMs/IRMs inserted.
		  o Directs Recirc run back to minimum, if Turbine still online.
		  o Direct CRD maximized.
		  o Enters EO-000-113 sheet 2 for control rod insertion:
		    ▪ Answers, "Is more than 1 control rod >00?" Yes.
		    ▪ Directs control rod insertion per EO-100-113 Sheet 2.
		• Executes Level Leg:
		  o Directs verification of isolations and initiations
		  o Answers, "Is initial ATWS pwr >5% or cannot be determined?" No.
		  o Directs Reactor water level controlled -129" to +54" using Table 15 systems (SLC, FW, Cond, CRD, LPCI) (narrower initial band expected based on initial power level – possibly 15-35").
		• Executes Pressure Leg:
		  o Directs Reactor pressure controlled 800-1050 psig using Turbine Bypass Valves.
		
		Acknowledges report of HPCI pipe routing area temperature high and failure to isolate.
		
		When HPCI pipe routing area and equipment area temperatures exceed 167°F (2 > max safe):
		• Exits Pressure Leg of EO-000-113.
		• Directs stopping and preventing RPV injection from FW, Cond, LPCI, and Core Spray per EO-100-113 LQ/L-18 (if RHR and Core Spray are not running, may not direct starting and terminating these systems).
		• **Enters EO-000-112, Rapid Depressurization**
		• Ensures RPV Injection is stopped and prevented iaw EO-100-113 LQ/L-18
		• Answers, "Is Supp Pool Lvl > 5'?" Yes.
		• **Directs opening all ADS valves.**
		• Answers, "Are all ADS valves open?" Yes.
		• Directs slowly raising injection to restore and maintain Reactor water level -129" to +54" using Table 15 systems (SLC, FW, Cond, CRD, LPCI) (narrower band expected based on initial power level – possibly 15-35").

SCENARIO EVENT FORM

EVENTS	6, 7, & 8
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	HPCI Steam Leak into Reactor Building, HPCI Fails to Automatically Isolate, HPCI Isolation Valves Stick Mid-Position When Manually Closed, Multiple Control Rods Fail to Insert

POSITION	TIME	STUDENT ACTIVITIES

ATC		**Rotates Mode Switch to SHUTDOWN.**
		
		Recognizes/reports failure of multiple control rods to insert and APRMs are downscale.
		
		Arms and depresses manual scram pushbuttons (4).
		
		Inserts SRMs/IRMs.
		
		If directed, runs Recirc to minimum From any RRP HMI screen by:
		• Selects MANUAL FLOW REDUCTION INITIATION.
		• Selects RRP SPEED TO MINIMUM.
		• Selects INITIATE RRP FLOW REDUCTION.
		
		Maximizes CRD per OP-155-001:
		• Place control switch CRD Pump 1P132B(A) to RUN, to start 1P132B(A), Ctl Rod Drive Water Pump B(A).
		• Using FC C12 1R600, CRD Flow Controller, in MANUAL, Fully Open FV 146 F002A(B), CRD Flo Ctl.
		• Fully Open THTLG PV 146 F003, DRIVE WTR PRESS THTLG valve.
		
		Inserts control rods using RMCS per EO-000-113 Sheet 2 hard card:
		• Bypass RWM.
		• Establish approximately (if obtainable) (closing Charging Water Iso 146F034 as necessary):
		  o 63 gpm cooling water flow.
		  o 350 psid drive water pressure.
		• Select rod.
		• Depress continuous insert pushbutton.
		
		Controls Reactor water level -129” to +54” using Table 15 systems (SLC, FW, Cond, CRD, LPCI) (narrower initial band expected based on initial power level – possibly 15-35”).

SCENARIO EVENT FORM

EVENTS	6, 7, & 8
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	HPCI Steam Leak into Reactor Building, HPCI Fails to Automatically Isolate, HPCI Isolation Valves Stick Mid-Position When Manually Closed, Multiple Control Rods Fail to Insert

POSITION	TIME	STUDENT ACTIVITIES
ATC (cont)		Before rapid depressurization is performed, stops and prevents RPV injection from FW and Cond per OP-145-001 hard card: • IF RFP A(B)(C) is in DPM, or transfer to DPM is in progress: o Control level in MANUAL via LV-10641 FW Startup Control Vlv controller LIC-C32-1R602. o As required, Adjust INC/DEC button on feeding RFP A(B)(C) SPD CTL/DEMAND SIGNAL controller SIC C32 1R601A(B)(C) in MANUAL to establish and maintain assigned level band. (2.19.9b) Slowly raises injection to restore and maintain Reactor water level -129" to 54" using Table 15 systems (SLC, FW, Cond, CRD, LPCI).

SCENARIO EVENT FORM

EVENTS	6, 7, & 8
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	HPCI Steam Leak into Reactor Building, HPCI Fails to Automatically Isolate, HPCI Isolation Valves Stick Mid-Position When Manually Closed, Multiple Control Rods Fail to Insert

POSITION	TIME	STUDENT ACTIVITIES

BOP		Starts ESW and all individual Room Coolers.
		
		Attempts to manually isolate HPCI by closing:
		• HV-155-F002
		• HV-155-F003
		
		Recognizes/reports HPCI isolation valves failed mid-position and HPCI is NOT isolated.
		
		Initiates ARI by arming and depressing ARI DIV 1 MAN TRIP HS-147103A1 TRIP and ARI DIV 2 MAN TRIP HS-147103B1 TRIP.
		
		Controls Reactor pressure 800-1000 psig using Turbine Bypass Valves.
		
		If directed, stops and prevents RPV injection from LPCI per OP-149-001 hard card:
		• Checks RHR loop pressures and ensures loops are not voided.
		• Arm AND Depress initiation buttons HS-E11-1S20A and HS-E11-1S20B.
		• Place pump control switches 1P202A(B)(C)(D) to STOP, then Release.
		• Observe white pump override lights ILLUMINATED, and NO RHR Pumps running.
		
		If directed, stops and prevents RPV injection from Core Spray per OP-151-001 hard card:
		• IF Core Spray NOT initiated, Arm AND Depress initiation button HS-E21-1S16A and B.
		• Shutdown pumps:
		  o Place pump control switches 1P206A(B)(C)(D) to STOP AND Release.
		  o Observe white pump override lights ILLUMINATED.
		  o Observe no Core Spray pump running.
		
		Recognizes/reports high temperature in HPCI pipe routing area.
		
		Opens ADS valves.
		
		Initiates Suppression Pool cooling.

Facility: Susquehanna   Scenario No.: NRC-2   Op-Test No.: 2013

Examiners: ______________________   Operators: ______________________

______________________   ______________________

______________________   ______________________

Initial Conditions: The plant is operating at approximately 100% power. EHC pump A is out of service for maintenance. RCIC is out of service for maintenance.

Turnover: Perform half scram testing for RPS scram channel A1 per SO-158-001.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Perform Half Scram Testing SO-158-001
2	rfDB105 101	C - All	MCC 1B217 De-Energizes, Loss of Power to Drywell Spray Valves, Loss of RPS Bus A ON-158-001, Technical Specifications
3	Report	R – ATC, SRO	Power Reduction Due to Minimum Generation Emergency Notification OI-AD-029, GO-100-012
4	mfHP1520 04	I – BOP, SRO	HPCI Inadvertent Initiation ON-156-001, Technical Specifications
5	cmfTH02_ TE14357A 1A2	C – All	Recirculation Pump A High Temperature AR-102-001 (G03), ON-164-002, Technical Specifications
6	cmfBR03_ 1A10201 cmfBR03_ 1A10204	C – All	Electrical Fault on Bus 11B ON-103-003, ON-100-101, EO-000-102
7	mfRR1640 11A	M – All	Reactor Coolant Leak in Drywell EO-000-102, EO-000-103
8	mfFW1440 03A(C)	C – All	Trip of Condensate Pumps 1A and 1C EO-000-102
9	mfHP1520 15	C – All	HPCI Trip EO-000-102, EO-000-112
10	mfAD1830 01	C – BOP, SRO	ADS Fails to Automatically Initiate EO-000-102, EO-000-112

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

Facility: **Susquehanna**	Scenario No.: **NRC-2**	Op-Test No.: **2013**
1. Total malfunctions (5-8) **Events 2, 4, 5, 6, 7, 8, 9, 10**	8	
2. Malfunctions after EOP entry (1-2) **Events 8, 9, 10**	3	
3. Abnormal events (2-4) **Events 2, 4, 5, 6**	4	
4. Major transients (1-2) **Event 7**	1	
5. EOPs entered/requiring substantive actions (1-2) **EO-000-102, EO-000-103**	2	
6. EOP contingencies requiring substantive actions (0-2) **EO-000-102 Alt Level Leg, EO-000-112**	2	
7. Critical tasks (2-3)	2	
CRITICAL TASK DESCRIPTIONS: **CT-1 – Spray the Drywell when Suppression Chamber exceeds 13 psig.** **CT-2 – Perform Rapid Depressurization when RPV level drops to -161".**		

TEAM SUSQUEHANNA Generating Excellence	**PPL–SUSQUEHANNA, LLC LEARNING CENTER**
	SIMULATOR SCENARIO
Scenario Title:	**NRC 2013 Scenario #2**
Scenario Duration:	**1.5 hours**
Scenario Number:	**NRC 2013 Scenario #2**
Revision / Date:	**0 / March 27, 2013**
Course:	**Licensed Operator Initial**
Operational Activities:	

Prepared By:	Tom Hooper Instructor	03/27/2013 Date
Reviewed By:	R. [illegible] Operations Training Supervisor	4/8/13 Date
Approved By:	Donnie L. Crawford Supervising Manager/Shift Manager	4/8/13 Date

TEAM SUSQUEHANNA Generating Excellence	PPL–SUSQUEHANNA, LLC LEARNING CENTER SIMULATOR SCENARIO	
Scenario Title:	**NRC 2013 Scenario #2**	
Scenario Duration:	**1.5 hours**	
Scenario Number:	**NRC 2013 Scenario #2**	
Revision / Date:	**0 / May 30, 2013**	
Course:	**Licensed Operator Initial**	
Operational Activities:		
Prepared By:	Tom Hooper / Robert A. Thompson Instructor	05/30/2013 Date
Reviewed By:	R. Streeper Operations Training Supervisor	04/08/2013 Date
Approved By:	Lonnie L. Crawford, Jr. Supervising Manager/Shift Manager	04/08/2013 Date

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO SUMMARY

The crew assumes the shift with the plant operating at approximately 100% power. EHC pump A is out of service for maintenance. RCIC is out of service for maintenance.

The crew will begin by performing half scram surveillance testing for Reactor Scram Instrument Channel A1 SO-158-001. When the crew resets the half scram, MCC 1B217 will de-energize. This results in a loss of RPS bus A, as well as power to Drywell spray valves on RHR A. The crew will execute ON-158-001, Loss of RPS, to restore power to RPS bus A. The crew will reset the half scram, reset NSSSS logic, and recover the RBCW isolation. The crew will also enter ON-100-106, Loss of Reactor Heat Balance Calculation, due to isolation of RWCU. The crew will lower power slightly due to loss of core thermal power calculation for greater than 15 minutes.

Next, the crew will be notified that a Minimum Generation Emergency has been declared and that a 50 MWe reduction on Unit 1 is requested ASAP. The crew will reduce power in accordance with OI-AD-029, Emergency Load Control, and GO-100-012, Power Maneuvers.

Next, HPCI will spuriously start. HPCI will inject into the Reactor and Reactor power will rise. The crew will take action to override HPCI injection per OP-152-001. The crew will also execute ON-156-001, Unanticipated Reactivity Change. HPCI will be inoperable but available for the remainder of the scenario. The SRO will determine that with RCIC already out of service, this requires the plant to be taken to Mode 3 within 12 hours.

A high temperature condition will develop on Recirculation pump A lower guide bearing. The crew will respond per AR-102-001 (G03) and trip the pump once limits are exceeded. The crew will also execute ON-164-002, Loss of Recirculation Flow, and the SRO will determine the impact of single loop operations in Technical Specifications.

Next, a fault will occur on Auxiliary Bus 11B. This will lead to loss of two Condensate pumps, one Service Water pump, two Circulating Water pumps, and the only operating Recirculation pump. The crew will scram the Reactor due to the loss of all Recirculation pumps. The crew will execute ON-100-101, Scram, Scram Imminent, ON-103-003, 13.8 KV Bus 11A Loss, and EO-000-102, RPV Control.

Next, the two remaining Condensate pumps will trip and a Reactor coolant leak will develop inside the Drywell. The crew will enter EO-000-103, Primary Containment Control. The crew will transition to HPCI to maintain Reactor water level, spray the Suppression Chamber, and then spray the Drywell. Sprays will be successful in lowering Containment pressures.

HPCI will trip and the Reactor coolant leak will worsen. ADS will fail to automatically initiate. Reactor water level will lower below the top of active fuel and the crew will execute EO-000-112, Rapid Depressurization. The crew will open the ADS valves to lower Reactor pressure and then restore and maintain Reactor water level with low pressure injection systems.

The scenario will be terminated when the ADS valves are open, Reactor water level is being controlled in the assigned band above -161", and Containment parameters are being controlled per EO-000-103.

The highest expected EAL classification at scenario termination is expected to be Alert FS1, based on high Drywell pressure due to coolant leakage and low Reactor water level.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO OBJECTIVES

The objective of this scenario is to evaluate the Licensed Operator Candidate's ability to respond to the scenario events. These events will require each candidate to demonstrate the following:

- Knowledge of integrated plant operations
- Ability to diagnose abnormal plant conditions
- Ability to work together as a team
- Ability to mitigate plant transients that exercise their knowledge and use of ONs and EOPs
- Ability to utilize Technical Specifications (SRO Only)

To meet this objective, the Licensed Operator Candidates must demonstrate proficiency in the following competencies:

Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings.
2. Comply with and use procedures, references, and Technical Specifications.
3. Operate the control boards.
4. Communicate and interact with other crew members.

Senior Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings.
2. Comply with and use procedures and references.
3. Operate the control boards (N/A to upgrade candidates).
4. Communicate and interact with the crew and other personnel.
5. Direct shift operations.
6. Comply with and use Technical Specifications.

THIS PAGE IS INTENTIONALLY LEFT BLANK

CRITICAL TASKS

1. Critical Task 1

   Spray the Drywell when Suppression Chamber pressure exceeds 13 psig.

Safety Significance

Maintenance of primary containment integrity.

Actions are taken to spray the Drywell during a LOCA when the Suppression Chamber pressure exceeds 13 psig. From the Susquehanna Emergency Operating Procedures basis document, EO-000-103, "The value of 13 psig is the lowest suppression chamber pressure which can occur when 95% of the non-condensables (Nitrogen) in the drywell have been transferred to the suppression chamber." At 13 psig suppression chamber pressure, 5% of the non-condensables remain in the drywell. This 5% value is the limit established to preclude "chugging" – the cyclic condensation of steam at the downcomer openings of the drywell vents. Values in excess of 13 psig are indicative of more non-condensables in the drywell, meaning chugging is more probable.

Chugging (steam bubble collapse at the downcomer exit resulting in a water in-rush to fill the voided areas) induces stresses at the junction of the downcomers and the drywell floor. Repeated such stresses may result in failure of these joints, creating a direct bypass from drywell to suppression chamber. Bypassing the suppression pool will directly pressurize the primary containment during a LOCA may result in failure.

By requiring drywell sprays at 13 psig in the suppression chamber (5% non-condensables in the drywell), a drywell non-condensable value of >1% will be maintained and chugging should not occur.

From Appendix D of NUREG-1021, Draft Revision 9, the critical task listed above has essential safety action that correctly completed, will prevent "degradation of any barrier to fission product release" and the crew will take action to "effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition describe in the previous paragraph."

Consequences of Failure to Perform the Task

Potential failure of primary containment.

SSES EOP Basis for:

PC/P-5 **WHEN** SUPP CHMBR PRESS > **13 PSIG**
CONTINUE
[Directions to initiate drywell sprays]

Drywell spray operation may affect the availability of electrical equipment located in the drywell. Therefore, suppression chamber sprays are given the maximum time allowable to reduce primary containment pressure before operation of drywell sprays is required.

The allowable time is determined by the suppression chamber pressure which is equated to the amount of non-condensables remaining in the drywell.

The value of 13 psig is the lowest suppression chamber pressure which can occur when 95% of the non-condensables (N2) in the drywell have been transferred to the suppression chamber. That is, at least 5% non-condensables remain in the drywell when suppression chamber pressure reaches 13 psig. This non-condensable concentration limit is established to preclude chugging - the cyclic condensation of steam at the downcomer openings of the drywell vents. A suppression chamber pressure greater than 13 psig could be indicative of a lower concentration of non-condensables in the drywell, thereby meaning that chugging is more probable.

Chugging occurs when a steam bubble collapses at the exit of the downcomers, the rush of water drawn into the downcomers to fill the void induces stresses at the junction of the downcomers

and the drywell floor. Repeated occurrence of such stresses could cause fatigue failure of these joints, thereby creating a direct path between the drywell and suppression chamber. Steam discharged through the downcomers could then bypass the suppression pool and directly pressurize the primary containment. Scale model tests have demonstrated that chugging will not occur so long as the drywell contains at least 1% non-condensables. To preclude conditions under which chugging may occur, drywell sprays are conservatively required when at least 5% non-condensables remain in the drywell, i.e., suppression chamber pressure reaches 13 psig.

Both wide range and narrow range suppression chamber pressure indication is available in the control room. Wide range suppression chamber pressure indication is available locally on Containment H2/O2 Analyzer Panel if analyzer is selected to suppression chamber.

Indications/Cues for the Event Requiring Critical Task

Multiple control board and control room indications of suppression chamber and drywell pressures.

Performance Criteria

Start an RHR loop
Perform a valve alignment to provide a flowpath for spray.

Performance Feedback

RHR pump, valve and system flow indications are available.
Multiple indications of Drywell pressure dropping

2. Critical Task 2

Perform Rapid Depressurization when RPV level drops to -161"

Safety Significance
RPV leakage or loss of injection systems impacts the ability to provide continued adequate core cooling through core submergence based on inventory loss.

Consequences for Failure to Perform Task
Failure to take the EOP actions will result in uncovering the core and breach of the fuel clad due to over heating.
SSES EOP Basis for:
The following steps provide the operating crew guidance to line up injection systems as available to maintain level >-129". If these actions are unsuccessful, the crew receives additional direction when it is determined that level can not be maintained above TAF.
RC/L- 4 RESTORE AND MAINTAIN LVL BETWEEN
+13" AND **+54"**
USING TABLE **3** SYSTEMS
RC/L-5 **IF** LVL CANNOT BE RESTORED AND MAINTAINED **> +13"**
MAINTAIN LVL **> -129"** USING TABLE **3** SYSTEMS
AUGMENTING AS DESIRED WITH
TABLE **5** ALTERNATE SUBSYSTEMS
RC/L-10 IRRESPECTIVE OF VORTEX LIMITS
WITH TABLE **3** SYSTEMS
PERFORM ALL
1 LINE UP FOR INJECTION
2 START PUMPS
3 INCREASE INJECTION TO MAX
RC/L-11 **IF** LESS THAN 2 TABLE **4** SUBSYSTEMS CAN BE LINED UP
COMMENCE LINING UP AS MANY AS POSSIBLE
TABLE **5** ALTERNATE SUBSYSTEMS
RC/L-13 WITH TABLE **5** ALTERNATE SUBSYSTEMS PERFORM ALL:
1 LINE UP FOR INJECTION
2 START PUMPS
3 INCREASE INJECTION TO MAX
RC/L-16 **WHEN** LVL CANNOT BE RESTORED AND MAINTAINED **> -161"** GO TO RAPID DEPRESS
Rapid Depressurization is not initiated until RPV water level has dropped to -161" (TAF) because:

- Adequate core cooling exists so long as RPV water level remains above -161" (TAF).
- The time required for RPV water level to decrease to -161" (TAF) can best be used to line up and start pumps, attempting to reverse the decreasing RPV water level trend before Rapid Depressurization is required to assure continued adequate core cooling.

(Reference: SSES-EPG C1-4 and second override before C3-1)

Indications/Cues for Event Requiring Critical Task
Reactor water level trending downward, eventually indicating less than the top of active fuel height on the Fuel Zone Level Indicator.

Performance Criteria
Perform a Rapid Depressurization per EO-100-112 when water level reaches the TAF –161" as read on the Fuel Zone Instrument.
Initiate ADS / Manually open all 6 ADS valves

Performance Feedback
Initiating a rapid depressurization causes Reactor pressure to lower to the shutoff head of the low pressure injection systems allowing water level to rise on the Fuel Zone and Wide Range level instruments.
Verify ADS valves are open using light red light indication, acoustic monitoring and lowering Reactor pressure and rising reactor water level.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO MALFUNCTIONS

Malfunction	Description	Crew Response
1	MCC 1B217 De-Energizes, Loss of Power to Drywell Spray Valves, Loss of RPS Bus A	Places RPS bus A on alternate supply, resets half scram, resets NSSSS logic, restores from RBCW isolation
2	Power Reduction Due to Minimum Generation Emergency Notification	Lower Reactor power
3	HPCI Inadvertent Initiation	Secure HPCI, determine Technical Specification impact
4	Recirculation Pump A High Temperature	Secure Recirculation pump A
5	Electrical Fault on Bus 11B	Scram the Reactor
6	Reactor Coolant Leak in Drywell	Spray the Suppression Pool and Drywell
7	Trip of Condensate Pumps 1A and 1C	Control Reactor water level with HPCI
8	HPCI Trip	Rapidly depressurize the Reactor and control Reactor water level with low pressure systems
9	ADS Fails to Automatically Initiate	Manually open ADS valves

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO REFERENCES

1.	SO-158-001	WEEKLY MANUAL SCRAM CONTROL SWITCH FUNCTIONAL CHECK
2.	ON-156-001	UNANTICIPATED REACTIVITY CHANGE
3.	OP-152-001	HPCI SYSTEM
4.	TS 3.5.1	ECCS – OPERATING
5.	ON-158-001	LOSS OF RPS
6.	ON-100-006	LOSS OF REACTOR HEAT BALANCE CALCULATION
7.	AR-102-001 (G03)	RECIRC PUMP MOTOR HI TEMP
8.	ON-164-002	LOSS OF REACTOR RECIRCULATION FLOW
9.	TS 3.4.1	RECIRCULATION LOOPS OPERATING
10.	ON-100-101	SCRAM, SCRAM IMMINENT
11.	EO-000-102	RPV CONTROL
12.	ON-103-003	13.8 KV BUS 11A AND 11B LOSS OF BUS LOAD SHEDDING ON BUS UNDERVOLTAGE
13.	EO-000-103	PRIMARY CONTAINMENT CONTROL
14.	EO-000-112	RAPID DEPRESSURIZATION
15.	OP-149-004	RHR CONTAINMENT COOLING
16.	OP-160-001	DRYWELL VENTILATION SYSTEM
17.	OP-155-001	CONTROL ROD DRIVE HYDRAULIC SYSTEM
18.	OP-153-001	STANDBY LIQUID CONTROL SYSTEM
19.	OP-149-001	RHR SYSTEM
20.	OP-151-001	CORE SPRAY SYSTEM

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO SPECIAL INSTRUCTIONS

1. Simulator setup
   a. **Initialize** to IC–377
   b. **Run** SCN file **n13scen2.scn**
2. **Place** the simulator in RUN
3. **Verify** the following malfunctions/overrides, event triggers and key assignments:

MF	RF	OR	SCN	ET	CONDITIONS	KEYS
3:3	1:1	0:0	0	2:0	10	6

4. **Prepare** the simulator for evaluation
   a. **Complete** a simulator exam checklist, NTP–QA–31.10 Attachment B
   b. **Place** a tag on EHC pump 1A handswitch.
   c. **Place** tags on RCIC.
5. **Prepare** a Turnover Sheet including the following:
   a. Perform half scram testing for Reactor Scram Instrument Channel A1 per SO-158-001.
6. **Prepare** a Surveillance Authorization Coversheet NDAP-QA-0722 -1 (available on X drive X:\FORMS\Nuclear\NDAP) and staple to copy of SO-158-001.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO FILES

n13scen2.scn

```
; Monitored parameters
SCN rat_mp
SCN n13scen2mp

; EHC Pump A OOS
IRF crfPM10_1P113A f:OUT

; RCIC OOS
IMF mfRC150011

; Crew performs half scram testing on RPS channel A1

; When crew resets half scram, MCC 1B217 deenergizes,
; causing loss of RPS A and power to DW spray valves
aet n13scen2et3

; Crew lowers power by 50 MWe due to min generation emergency

; HPCI spuriously initiates
{Key[1]} IMF mfHP152004 c:10

; NPO opens HPCI room drain valve
{Key[11]} IRF rfLD120003 f:OPEN

; Recirc pump A high temperature
{Key[2]} IMF cmfTH02_TE14357A1A2 r:10:00 f:300

; Electrical fault on Bus 11B
{Key[4]} IMF cmfBR03_1A10201
{Key[4]} IMF cmfBR03_1A10204

; Reactor coolant leak in Drywell
{Key[5]} IMF mfRR164011A r:3:00 f:0.2

; Trip of Condensate pumps 1A and 1C
{Key[5]} IMF mfFW144003A
{Key[5]} IMF mfFW144003C

; HPCI trip and coolant leak gets worse
{Key[5]} IMF mfHP152015 d:12:00
aet n13scen2et1

; Coolant leak gets worse once Drywell sprays are in service
{Key[6]} MMF mfRR164011A r:30 f:1.5

; ADS fails to initiate automatically
IMF mfAD183001
```

.3scen2mp.scn

```
insmp aoTRSHB311R601G.CurrValue
changemp aoTRSHB311R601G.CurrValue 0,300,DEG F,RECIRC PMP A MTR PH C TEMP

insmp aoTRSHB311R601D.CurrValue
changemp aoTRSHB311R601D.CurrValue 0,300,norm,RECIRC PMP A MTR LO BRG TEMP

insmp zaoti11305
changemp zaoti11305 ,,,RBCCW Supply Temp

insmp aoFI15120AA.CurrValue
changemp aoFI15120AA.CurrValue 0,12000,norm,RHR A DW SPRAY FL

insmp aoFI15120BA.CurrValue
changemp aoFI15120BA.CurrValue 0,12000,norm,RHR B DW SPRAY FL
```

n13scen2et1.et

```
;HPCI trip malfunction inserted
mfHP152015.Status=1
```

n13scen2et1.scn

```
IMF mfRR164011A r:3:00 i:0.2 f:1
```

n13scen2et3.scn

```
;SWITCH:RPS SCRAM RESET
diHSC72A1S05.CurrValue != #OR.diHSC72A1S05.NORM
```

n13scen2et3.scn

```
IRF rfDB105101 f:OPEN d:3
```

SCENARIO EVENT DESCRIPTION FORM

Initial Conditions: Ensure shift positions are assigned, have the Crew conduct the turnover and perform a panel walk down before the start of the scenario.

EVENT	OP EVENT / TASK	TIME	DESCRIPTION
N/A	N/A	0	Crew assumes shift
1	N/A	5	Perform Half Scram Testing
2	N/A	10	MCC 1B217 De-Energizes, Loss of Power to Drywell Spray Valves, Loss of RPS Bus A
3	N/A	20	Power Reduction Due to Minimum Generation Emergency Notification
4	N/A	30	HPCI Inadvertent Initiation
5	N/A	40	Recirculation Pump A High Temperature
6	N/A	55	Electrical Fault on Bus 11B
7	N/A	60	Reactor Coolant Leak in Drywell
8	N/A	60	Trip of Condensate Pumps 1A and 1C
9	N/A	70	HPCI Trip
10	N/A	85	ADS Fails to Automatically Initiate

SCENARIO EVENT FORM

EVENT	1
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Perform Half Scram Testing

POSITION	TIME	STUDENT ACTIVITIES
SRO		Directs ATC to perform half scram testing for Reactor Scram Instrument Channel A1 per SO-158-001.

ATC		Performs half scram testing for Reactor Scram Instrument Channel A1 per SO-158-001:
		• Place RPS MAN SCRAM CHAN A1 HS-C72A-1S03A control switch to ARMED.
		• Verify annunciator AR-103-A03, RPS MAN SCRAM CHANNEL A1/A2 SWITCH ARMED is ILLUMINATED.
		• Depress RPS MAN SCRAM CHAN A1 HS-C72A-1S03A control switch.
		• Verify the following annunciator alarms ILLUMINATED:
		  ○ AR-103-A01, RPS CHANNEL A1/A2 AUTO SCRAM
		  ○ AR-103-F01, RPS CHANNEL A1/A2 MAN SCRAM
		• Place RPS MAN SCRAM CHAN A1 HS-C72A-1S03A control switch to DISARMED.
		
		Reset A RPS half scram by momentarily positioning REACTOR SCRAM RESET HS-C72A-1S05 to GROUP 1/4 position AND THEN to GROUP 2/3 position.

BOP		Monitors plant parameters. Provides peer checks.

NOTES	

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	1
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Perform Half Scram Testing

INSTRUCTOR ACTIVITY

1. None

ROLE PLAY

Role play any directed actions as required.

EVALUATOR NOTES

1. When the crew resets the half scram, the next event will be automatically inserted (loss of MCC 1B217).

SCENARIO EVENT FORM

EVENT	2
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	MCC 1B217 De-Energizes, Loss of Power to Drywell Spray Valves, Loss of RPS Bus A

POSITION	TIME	STUDENT ACTIVITIES
Team		Recognizes/reports: • AR-103-001 (A01), RPS CHANNEL A1/A2 AUTO SCRAM • AR-016-001 (A04), ESS 480V LC 1B210 TROUBLE • Loss of RPS bus A • Loss of power to RHR A Drywell spray valves
SRO		May refer to ON-104-201, Loss of 4KV ESS Bus 1A, Attachment E for MCC 1B217 load list and impact. Enters ON-158-001, Loss of RPS. Enters ON-100-006, Loss of Reactor Heat Balance Calculation. • IF valid indication of the Core Thermal Power Heat Balance is not available for greater than 15 minutes, Decrease core flow by approximately 0.5 Mlb/hr if necessary in accordance with RE Instructions in CRC book to ensure reactor power has margin to the authorized thermal power limit (~0.25% power). Determines Technical Specification 3.8.7 Required Action A.1 requires restoring 1B217 to operable within 8 hours. May refer to Technical Specification 3.5.1 Condition A for loss of Core Spray A (7 day LCO). May refer to Technical Specification 3.1.7 Condition B for loss of SLC B (7 day LCO). (Note: Technical Specification 3.0.6 applies (no cascading of Technical Specifications.)
ATC		If directed, lowers core flow by approximately 0.5 Mlb/hr (~0.25% power). Reset A RPS half scram by momentarily positioning REACTOR SCRAM RESET HS-C72A-1S05 to GROUP 1/4 position AND THEN to GROUP 2/3 position.

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	2
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	MCC 1B217 De-Energizes, Loss of Power to Drywell Spray Valves, Loss of RPS Bus A

INSTRUCTOR ACTIVITY

1. When the crew resets the half scram in the previous event, verify **automatic event trigger n13scen2et3 inserts** the following remote function:

   IRF rfDB105101 f:OPEN d:3

ROLE PLAY

If directed to investigate MCC 1B217, wait 2 minutes, then report:

> **"The feeder breaker to 1B217, 1B210-013, is tripped. I don't see anything specifically wrong at 1B217."**

If asked as Electrical Maintenance about reclosing 1B210-013, wait 2 minutes, then report:

> **"We do NOT recommend attempting reclosure of 1B210-013 until we investigate further."**

As **WWM** (or equivalent) contacted for assistance, acknowledge request.

Role play any directed actions as required.

EVALUATOR NOTES

Once the crew has reset the half scram, reset NSSSS logic, recovered RBCW, and determined extent of Core Spray / RHR loss, recommend moving on to the next event.

SCENARIO EVENT FORM

EVENT	2
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	MCC 1B217 De-Energizes, Loss of Power to Drywell Spray Valves, Loss of RPS Bus A

POSITION	TIME	STUDENT ACTIVITIES
BOP		Executes ON-158-001, Loss of RPS: • Determines Attachment A is applicable. • Transfer A RPS bus to alternate power supply as follows: o Ensure ALTERNATE A FEED White indicating light ILLUMINATED. o Ensure RPS M G SET TRANSFER SWITCH HS-C72B-S1 in NORM position. o Place RPS M G SET TRANSFER SWITCH HS-C72B-S1 in ALT A position. • Coordinates with ATC to reset half scram. • Reset NSSSS isolation logic as follows: o Depress MN STM LINE DIV 1 ISO RESET HS-B21-1S32. o Depress MN STM LINE DIV 2 ISO RESET HS-B21-1S33. • Recover from RBCW isolation as follows: o Ensure RRP A CLG WTR OB ISO VALVES HV-18791A1&A2 CLOSED. o Ensure RRP B CLG WTR IB ISO VALVES HV-18792A1&A2 CLOSED. o Depress HV-18791A1&A2 ISOLATION RESET. o Depress HV-18792A1&A2 ISOLATION RESET. o Ensure RRP A CLG WTR OB ISO VALVES HV-18791A1&A2 OPEN. o Ensure RRP B CLG WTR IB ISO VALVES HV-18792A1&A2 OPEN.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT FORM

EVENT	3
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Power Reduction Due to Grid Emergency Notification

POSITION	TIME	STUDENT ACTIVITIES
Team		Acknowledge Minimum Generation Emergency notification from GCC.
SRO		May refer to OI-AD-029 attachment D and CRC Book. Directs ATC to reduce power by 50 MWe with Recirculation flow. Provides oversight of reactivity maneuver.
ATC		Reduces power by approximately 50 MWe: • Using the RRP Dual Screen HMI, lowers A and B Recirc speeds by depressing the double chevron DEC buttons, as necessary. • Observes diverse plant indications: o APRMs o Core Thermal Power o MWe o RRP parameters o Core flow (Recirc loop mismatch <5%) o Reactor water level • Plots power reduction on Power to Flow Map.
BOP		Monitors plant parameters. Provides peer checks for reactivity manipulations.

NOTES	

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	3
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Power Reduction Due to Grid Emergency Notification

INSTRUCTOR ACTIVITY

1. When directed by lead examiner, **make the following report** to initiate event:

   "This is Lou Spinelli at GCC. A Minimum Generation Emergency is required and we need Susquehanna Unit 1 to reduce output by 50 MWe as quickly as possible."

ROLE PLAY

Role play any directed actions as required.

EVALUATOR NOTES

1. None

SCENARIO EVENT FORM

EVENT	4
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	HPCI Inadvertent Initiation

POSITION	TIME	STUDENT ACTIVITIES
Team		Recognizes/reports HPCI initiation. Recognizes/reports AR-114-001 (E02), HPCI PUMP DSCH LO FLOW. Recognizes/reports Reactor power change. Observes Drywell pressure and Reactor water level and determines HPCI injection is not required.
SRO		Directs overriding HPCI injection. Directs action to restore Reactor power less than license limit, if necessary. Enters ON-156-001. Declares HPCI inoperable. Determines Technical Specification Required Action 3.5.1 Condition D.1 cannot be met, therefore Condition H requires the plant to be in Mode 3 within 12 hours.
ATC		Monitors Reactor power and water level. May reduce Recirculation flow to restore Reactor power. Performs ON-156-001 actions as directed.

NOTES	

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	4
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	HPCI Inadvertent Initiation

INSTRUCTOR ACTIVITY

1. When directed by lead examiner, **depress KEY 1** to initiate event:

   {Key[1]} IMF mfHP152004 c:10

2. If dispatched as **NPO** to open HPCI room drain valve, wait two minutes, **depress KEY 11**, then report completion.

   {Key[11]} IRF rfLD120003 f:OPEN

ROLE PLAY

As **NPO** dispatched to investigate HPCI, wait 2 minutes and report:

> **"There are no abnormal indications in the HPCI room."**

If dispatched as **NPO** to open HPCI room drain valve, wait two minutes, depress KEY 11 as described above, then report completion.

If asked as I&C to check HPCI before shutdown, wait 3 minutes, then report:

> **"We do NOT see anything immediately wrong with HPCI. You can go ahead and shut it down and we will continue troubleshooting afterwards."**

As **WWM** (or equivalent) contacted for assistance with troubleshooting/repairing HPCI, acknowledge request.

Role play any other directed actions as required.

EVALUATOR NOTES

1. Recirc pump rundown may occur due to low Feedwater pump suction pressure as HPCI is secured.

SCENARIO EVENT FORM

EVENT	4
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	HPCI Inadvertent Initiation

POSITION	TIME	STUDENT ACTIVITIES
BOP		Overrides HPCI injection: • Ensure HPCI AUXILIARY PUMP 1P213 switch placed to START. • Place HPCI TURBINE FLOW CONTROL FC-E41-1R600 in MANUAL. • Reduce demand to stop HPCI flow. Will likely maintain HPCI running on min flow during troubleshooting efforts, but may shutdown HPCI per OP-152-001 section 2.10.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT FORM

EVENT	5
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Recirculation Pump A High Temperature

POSITION	TIME	STUDENT ACTIVITIES
Team		Recognizes / reports: • AR-102-001 (G03), RECIRC PUMP MOTOR HI TEMP, alarms. • Recirc pump A lower guide bearing temperature is rising.
SRO		Ensures execution of AR-102-001 (G03). Directs trip of Recirculation pump A. Enters ON-164-002, Loss of Reactor Recirculation Flow. Determines single loop limits must be met per COLR Section 8.0 Limits in TRM Section 3.2. Determines Tech Spec LCO 3.4.1 applies for single loop operation. Determines TR 3.8.2.1, Motor Operated Valves (MOV) Thermal Overload Protection Continuous, applies while overload bypass is in TEST.
ATC		Executes AR-102-001 (G03): • IF shutdown of recirc pump imminent: o Reduce Reactor Power IAW RE Instructions in CRC Book. • WHEN any of following temperatures reached: ▪ Motor bearing: 195°F ▪ Motor winding: 248°F ▪ Seal Cavity: 200°F o Perform the following: ▪ Trip Reactor Recirc Pump A(B). ▪ Perform ON-164-002, Loss of Reactor Recirculation Flow.

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	5
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Recirculation Pump A High Temperature

INSTRUCTOR ACTIVITY

1. When directed by lead examiner, **depress KEY 2** to initiate event:

   {Key[2]} IMF cmfTH02_TE14357A1A2 r:10:00 f:300

ROLE PLAY

As **WWM** (or equivalent) contacted for assistance with Recirc pump A, acknowledge request.

As **Reactor Engineer** being informed of Recirc pump A out of service, acknowledge report and inform that you will review thermal limits.

Role play any other directed actions as required.

EVALUATOR NOTES

1. It is possible for a Reactor scram to occur during this event on OPRMs due to power/flow conditions after RRP A is tripped. This is likely to occur if the crew initiates a Lim #2 runback prior to tripping RRP A. If this occurs, insert the next event (fault on bus 11B) once the crew has stabilized the plant after the scram.
2. Recommend initiating the next event once the crew has tripped Recirculation pump A and is inserting control rods to get below the 60% rod line.

SCENARIO EVENT FORM

EVENT	5
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Recirculation Pump A High Temperature

POSITION	TIME	STUDENT ACTIVITIES

ATC (cont)		Executes ON-164-002, Loss of Reactor Recirculation Flow:
		• IF one Reactor Recirculation Pump trips:
		  o Comply with TRO 3.4.6.
		  AND
		  o Perform SO-164-004, Unit 1 Reactor Recirculation Single Loop Flow Recording.
		• IF operating recirculation pump speed is <75% rated speed (1260 rpm), Determine actual core flow by (else N/A):
		  o Display Core Pressure Drop via PICSY computer point NJP51 Core PL Press OR if PICSY unavailable via XR 14301: Point #5 – Recirc Core Plate DP.
		  o Determine actual core flow using Form GO 100 009 2 "Core Flow vs. Core Pressure Drop" curve.
		• Plot position on Power/Flow Map.
		• Perform appropriate action as specified on the Power/Flow map.
		• Perform appropriate action as specified in ON-178-002.
		• Request STA or other qualified individual to verify PICSY point NJZ51(NJZ52) RECIRC LOOP A NO FLOW Current Value is YES.
		• IF time permits, Disable all RFP A, B and C IND FLOW < 16.4% Inputs to Rx RECIRC RUNBK CKT in accordance with OP-164-001, prior to reducing power < 65% RTP.
		• Ensure thermal power REDUCED to < 60% rod line.
		• Reduce operating pump speed to maintain ≤ 80% rated pump speed (80% = 1344 rpm) AND operating loop flow to ≤ 53 Mlbm/hr in accordance with OP-164-001.
		• Comply with COLR Section 8.0 Limits in TRM.
		• Comply with Tech Spec LCOs 3.4.1.
		• Comply with TR 3.8.2.1, Motor Operated Valves (MOV) Thermal Overload Protection – Continuous.
		• Coordinates with BOP to close Recirc pump A discharge valve.
		• Notify Shift Supervision to clear TR 3.8.2.1.
		• Perform the applicable sections of GO-100-012, Power Maneuvers.

BOP		Monitors plant parameters. Coordinates with ATC to close Recirc pump A discharge valve: • For stopped pump, Place RECIRC A MOV OL BYPS HV-143-F031A/F032A key switch to TEST position. • Ensure RECIRC PUMP A DSCH BYPS HV-143-F032A OPEN. • Close RECIRC PUMP A DSCH HV-143-F031A. • Within 5 minutes, Re-Open RECIRC PUMP A DSCH HV-143-F031A. • AFTER 2 minutes, Place RECIRC A MOV OL BYPS HV-143-F031A/F032A key switch to NORM position.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT FORM

EVENT	6
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Electrical Fault on Bus 11B

POSITION	TIME	STUDENT ACTIVITIES
Team		Recognizes / reports loss of Bus 11B. Recognizes / reports no running Recirculation pumps. Recognizes / reports loss of: • Circulating Water pumps B and D • Service Water pump B and D • Condensate pumps B and D
SRO		Directs Reactor scram due to no running Recirculation pumps. Enters ON-100-101, Scram, Scram Imminent. Enters EO-000-102, RPV Control: • Directs verification of isolations and initiations. • Directs Reactor water level controlled +13" to +54" using Condensate, Feedwater, and CRD. • Directs Reactor pressure controlled 800-1050 psig using Turbine Bypass Valves. Enters ON-103-003, 13.8 KV Bus 11A and 11B Loss of Bus Load Shedding on Bus Undervoltage.

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	6
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Electrical Fault on Bus 11B

INSTRUCTOR ACTIVITY

1. When directed by the lead examiner, **depress KEY 4** to initiate event.

   {Key[4]} IMF cmfBR03_1A10201
   {Key[4]} IMF cmfBR03_1A10204

ROLE PLAY

As **NPO** dispatched check protective relays, wait 2 minutes and **report**,

> **"Breaker 1A10201 has an overcurrent flag tripped. There are no other abnormal indications at the breaker."**

As **NPO** dispatched to perform other restoration actions from ON-103-003, acknowledge requests, but delay any action.

As **WWM** (or equivalent) contacted for assistance with Bus 11B, acknowledge request.

Role play any other directed actions as required.

EVALUATOR NOTES

1. The initial post-scram level control band is likely to be +20" to +45".
2. Recommend initiating the next event once the crew has stabilized the plant post-scram.

SCENARIO EVENT FORM

EVENT	6
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Electrical Fault on Bus 11B

POSITION	TIME	STUDENT ACTIVITIES
ATC		Places the Mode Switch in SHUTDOWN. Executes ON-100-101, Scram, Scram Imminent: • Observe all Control Rods indicate fully inserted (using two indications, OD 7 completed as soon as possible). • Insert IRMs and SRMs. • Observe Scram Discharge Volume Vent and Drain valves CLOSED. • Check Reactor water level between 13" and 54". • Check Reactor pressure <1087 psig. • WHEN main generator load < 150 MWe, at 1C651, Depress Trip Pushbutton for Main Turbine. • Check Turbine speed is lowering. • Check status of MSIVs. • Ensure Feedwater is aligned for Start Up Level Control per OP-145-001.

BOP		Executes ON-100-101, Scram, Scram Imminent:
		• Verifies isolations and initiations:
		  o 13" Reactor water level isolations (ON-159-002 Attachment A).
		
		Executes ON-103-003, 13.8 KV Bus 11A and 11B Loss of Bus Load Shedding on Bus Undervoltage:
		• Selects attachment A.
		• Dispatches NPO to check bus protective relays.
		• Acknowledges overcurrent relay trip on Breaker 1A10101.
		• If desired / as time permits:
		  o Dispatches NPO to cross-tie load centers 1B120, 1B140, 1B100, 1B260, and 1B 270 per OP-105-001.
		  o Ensures Condensate, Feedwater, Service Water and Circulating Water system parameters are within limits.
		  o Confirms status of RFP HPU & Kidney Pumps at ICS HMI monitor.
		  o Dispatches NPO to perform local checks at RFP HPU skid.
		  o Monitors Condenser vacuum.
		  o Performs ON-134-001, Loss of RBCCW.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT FORM

EVENTS	7, 8, 9 & 10
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Reactor Coolant Leak in Drywell, Trip of Condensate Pumps 1A and 1C, HPCI Trip, ADS Fails to Automatically Initiate

POSITION	TIME	STUDENT ACTIVITIES
★		**Spray the Drywell when Suppression Chamber exceeds 13 psig.** **Perform Rapid Depressurization when RPV level drops to -161".**
TEAM		Recognizes / reports rising: • Drywell leakage • Drywell temperature • Drywell pressure • Loss of all Condensate and Feedwater
SRO		Enters EO-100-103, Primary Containment Control, due to high Drywell temperature and pressure. Re-enters EO-100-102, RPV Control, due to low Reactor water level and high Drywell pressure. Directs initiation of Suppression Chamber spray. Directs Reactor water level controlled between -129" and 54" using HPCI, CRD, and/or SBLC. When Suppression Chamber pressure exceeds 13 psig or Drywell temperature approaches 340°F: • Ensures shutdown of Drywell coolers and fans. • **Directs initiation of Drywell sprays with flow limited to between 1000 and 2800 gpm for first 30 seconds.** Determines Containment parameters are within the Pressure Suppression Limit. Determines Reactor water level cannot be maintained above -129". Directs lineup for injection and starting of pumps for all Table 3 injections systems. Determines more than 1 injection subsystem is lined up with a pump running.

★ Denotes Critical Task

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENTS	7, 8, 9 & 10
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Reactor Coolant Leak in Drywell, Trip of Condensate Pumps 1A and 1C, HPCI Trip, ADS Fails to Automatically Initiate

INSTRUCTOR ACTIVITY

1. When directed by lead examiner, depress KEY 5 to initiate coolant leak, trip of Condensate pumps, and delayed HPCI trip.

   {Key[5]} IMF mfRR164011A r:3:00 f:0.2
   {Key[5]} IMF mfFW144003A
   {Key[5]} IMF mfFW144003C
   {Key[5]} IMF mfHP152015 d:12:00

2. Twelve (12) minutes after Key 5 was initially inserted, ensure **mfHP152105** trips HPCI and **mfRR164011A** ramps up from 0.2 to 1 over 3:00 (caused by automatic event trigger n13scen2et1). These actions may be forced earlier if directed by lead examiner to move on with scenario. Recommend allowing Suppression Pool spray to be placed in service before forcing scenario.

3. Once Drywell sprays are in service and directed by lead examiner, depress KEY 6 to raise severity of leak:

   {Key[6]} MMF mfRR164011A r:30 f:1.5

ROLE PLAY

As **NPO** dispatched to investigate Condensate pumps A and C, wait 2 minutes and report:

"Condensate pump A and C tripped on overcurrent."

As **NPO** dispatched to investigate HPCI after it trips, wait 2 minutes and report:

"It looks like the HPCI turbine is damaged."

Role play any other directed actions as required.

EVALUATOR NOTES

1. HPCI was secured earlier in the scenario due to a spurious start, but it remains available for injection. The actions to restore HPCI will vary depending on the exact method used to initially secure it.
2. Once Drywell spray is in service, if desired to lower Reactor water level at a faster rate, direct insertion of KEY 6.
3. The final Reactor water level control band is likely to be +20" to +45".
4. Recommended termination criteria:
   - ADS valves open.
   - Reactor water level controlled in assigned band above -161".
   - Containment pressure controlled per EO-000-103.

SCENARIO EVENT FORM

EVENTS	7, 8, 9 & 10
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Reactor Coolant Leak in Drywell, Trip of Condensate Pumps 1A and 1C, HPCI Trip, ADS Fails to Automatically Initiate

POSITION	TIME	STUDENT ACTIVITIES
SRO (cont)		When Reactor water level drops to -161", enters EO-000-112, Rapid Depressurization: • Exits EO-000-102 pressure leg. • Determines Suppression Pool level is >5'. • **Directs opening all ADS valves.** • Determines all ADS valves are open. Directs Reactor water level restored and maintained between +13" and +54" using LPCI, Core Spray, CRD, and/or SBLC.

ATC / BOP		Initiates Suppression Chamber spray per OP-149-004:
		• IF available, Place Emergency Service Water System in operation supplying RHR Room Cooler and RHR Pump to be placed in service.
		• IF LOCA signal present, Place HS-E11-1S17A(B) LOCA ISOLATION MANUAL OVERRIDE Switch to OVERRIDE.
		  o Observe White Indicating Light ILLUMINATED above HS-E11-1S17A(B) LOCA ISOLATION MANUAL OVERRIDE.
		  o Observe LOCA ISO SWITCH LOOP (A)B MANUAL OVERRIDE (AR-109(113)-C5) Annunciator alarms.
		• Open HV-151-F028A(B) SUPP CHMBR SPR TEST SHUTOFF.
		• Close HV-151-F017A(B)RHR INJ FLOW CTL.
		• IF a RHR Pump not in service, Start 1P202A(B)(C)(D)RHR PUMP.
		• Throttle Open HV-151-F027A(B) SUPP POOL SPRAY CTL, as necessary, to maintain ≤ 500 GPM as indicated on FI-15120A(B) CONTN SPRAY DIV 1(2) AND maintain total loop flowrate ≤ 10,000 gpm.
		• Monitor Suppression Chamber pressure.
		• IF Suppression Chamber pressure drops to 0 psig, THEN Stop Suppression Chamber Sprays.

SCENARIO EVENT FORM

EVENTS	7, 8, 9 & 10
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Reactor Coolant Leak in Drywell, Trip of Condensate Pumps 1A and 1C, HPCI Trip, ADS Fails to Automatically Initiate

POSITION	TIME	STUDENT ACTIVITIES

ATC / BOP (cont)		• IF required, Place RHRSW in service to RHR HX per section 4.0:
		  o Place RHR Service Water in service to the RHR Heat Exchanger per OP-116-001 OR as follows:
		    ▪ Ensure Closed Unit 2 HV-21210A(B) RHRSW Hx A(B) INLET.
		    ▪ Open HV-11210A(B) Unit 1 RHRSW Hx A(B) INLET to 10% Open.
		    ▪ OPEN HV-11215A(B) Unit 1 RHRSW Hx A(B) OUTLET.
		    ▪ IF required, Place HS-11202A3(B3) RHRSW PUMP A(B) LOCA TRIP switch to RESET.
		    ▪ Start 1P506A(B) RHRSW Pump A(B).
		    ▪ Throttle HV-11210A(B) Unit 1 RHRSW Hx A(B) INLET to establish 8000 to 9000 gpm on FI-E11-1R602A(B) RHRSW HX A(B) INLET FLOW.
		  o Place HV-151-F048A(B) HX A(B) SHELL SIDE BYPS Control Switch to OFF/LOCA RESET position.
		  o Observe White Indicating Light ILLUMINATED above HV-151-F048A(B) Control Switch.
		  o Close HV-151-F048A(B) HX A(B) SHELL SIDE BYPS.

SCENARIO EVENT FORM

EVENTS	7, 8, 9 & 10
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Reactor Coolant Leak in Drywell, Trip of Condensate Pumps 1A and 1C, HPCI Trip

POSITION	TIME	STUDENT ACTIVITIES
ATC / BOP (cont)		Attempts to control Reactor water level between -129" and 54" using HPCI, CRD, and/or SBLC. • May inject with HPCI per OP-152-001: o If HPCI running on min flow with controller in MANUAL, Raise demand on HPCI TURBINE FLOW CONTROL FC-E41-1R600 OR return controller to AUTO. o If HPCI isolated earlier in scenario, may need to perform step by step startup per OP-152-001. • May maximize CRD flow per OP-155-001: o Place control switch CRD Pump 1P132B(A) to RUN, to start 1P132B(A), Ctl Rod Drive Water Pump B(A). o Using FC-C12-1R600, CRD Flow Controller, in MANUAL, Fully Open FV-146-F002A(B), CRD Flo Ctl. o Fully Open THTLG PV-146-F003, DRIVE WTR PRESS THTLG valve. • May inject with SBLC per OP-153-001: o Place HS-14804 SBLC MANUAL INITIATION keylock control switch to A(B) START. o Observe SBLC PUMPS 1P208A(B) STARTS. o Once initiated, Observe the following: ▪ HV-144-F004 RWCU INLET OB ISO CLOSES ▪ SBLC SQUIB READY A B white indicating lights EXTINGUISHED ▪ SBLC SQUIB VALVES LOSS OF CKT CONTINUITY annunciator ALARMS ▪ Pump 1P208A(B) Red indicating light ILLUMINATED ▪ SBLC PUMP discharge header pressure ~ 200 psig greater than reactor pressure ▪ SBLC FLOW Indicates ≥ 40 GPM ▪ SBLC Storage Tank level decreasing

SCENARIO EVENT FORM

EVENTS	7, 8, 9 & 10
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Reactor Coolant Leak in Drywell, Trip of Condensate Pumps 1A and 1C, HPCI Trip

POSITION	TIME	STUDENT ACTIVITIES
ATC / BOP (cont)		When Suppression Chamber pressure exceeds 13 psig or Drywell temperature approaches 340°F: • Secures Drywell coolers and fans. • **Initiates Drywell sprays with flow limited to between 1000 and 2800 gpm for first 30 seconds:** o Open HV-151-F021A(B) DRYWELL SPRAY IB ISO. o Ensure both RX Recirc Pumps, all DW Coolers and Fans are Shutdown. o Throttle HV-151-F016A(B) DRYWELL SPRAY OB ISO, as necessary, to establish a flowrate BETWEEN 1000 AND 2800 GPM for the first 30 seconds as indicated on FI-15120A(B) CONTN SPRAY DIV 1(2) AND maintain total loop flowrate ≤ 10,000 gpm. o AFTER 30 seconds, Throttle Open HV-151-F016A(B) to establish a total loop flowrate 9,500 to 10,000 GPM as indicated on FI-E11-1R603A(B) RHR A/C(B/D) FLOW. o Monitor Drywell pressure. o IF Suppression Chamber pressure drops to 0 psig, THEN Stop Suppression Chamber Sprays. o IF required, Place RHRSW in service to RHR HX per section 4.0. o AFTER Primary Containment parameters show a decreasing trend, IF DESIRED, Throttle HV-151-F016A(B) DRYWELL SPRAY OB ISO to establish a reduced flowrate. Recognizes / reports trip of HPCI. **Opens all ADS valves or initiates ADS.** Restores and maintains Reactor water level between +13" and +54" using LPCI, Core Spray, CRD, and/or SBLC. ▪

SCENARIO EVENT FORM

EVENTS	7, 8, 9 & 10
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Reactor Coolant Leak in Drywell, Trip of Condensate Pumps 1A and 1C, HPCI Trip

POSITION	TIME	STUDENT ACTIVITIES

ATC / BOP (cont)		<u>Possible actions to control LPCI (OP-149-001):</u>
		IF RHR Injection initiated and RPV pressure < 420 psig, Perform either of the following:
		• Throttle injection flow (45 second time delay):
		  o Throttle RHR INJ FLOW CTL HV-151-F017A(B) to achieve desired injection flow.
		  o Stop one RHR PUMP A or C (B or D) when loop flow is between 12000 gpm and 3000 gpm.
		  o Ensure RHR PP A/C (B/D) MIN FLOW HV-151-F007A(B) OPENS ≤ 30 seconds after system flow decreases below 3000 gpm.
		• Stop injection:
		  o Close RHR INJ FLOW CTL HV-151-F017A(B) (45 second time delay), OR
		  o Place pump control switches to STOP and then release.
		  o Observe white pump override lights ILLUMINATED, and NO RHR Pumps running.
		
		<u>Possible actions to control Core Spray (OP-151-001):</u>
		IF Core Spray initiated and injection with reactor pressure below 420 psig, Throttle OR Stop injection:
		• Throttle injection:
		  o To establish desired injection flow, Throttle CORE SPRAY LOOP A(B) IB INJ SHUTOFF HV-152F005A(B).
		  o AFTER system flow decreases below 635 gpm, Ensure CORE SPRAY LOOP A(B) MIN FLOW HV-152F031A(B) OPENS.
		• Stop injection:
		  o Close CORE SPRAY LOOP A(B) INJ SHUTOFF HV-152F005A(B), OR
		  o Shutdown pumps:
		    ▪ Place pump control switches to STOP AND Release.
		    ▪ Observe white pump override lights ILLUMINATED.
		    ▪ Observe no core spray pump running.

Facility: Susquehanna Scenario No.: NRC-3 Op-Test No.: 2013

Examiners: ______________ Operators: ______________

Initial Conditions: The plant is operating at approximately 90% power. Core Spray pump A is out of service for maintenance.

Turnover: Swap EHC pumps per OP-193-003 section 2.9. Then raise Reactor power with Recirculation flow per GO-100-012 section 5.4 and Reactivity Manipulation Package.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Swap EHC Pumps OP-193-003
2	N/A	R – ATC, SRO	Raise Reactor Power with Recirculation Flow GO-100-012
3	mfTC1930 03	C – ATC, SRO	EHC Oscillations ON-193-001
4	cmfRV04_ PSV141F1 3K	C – BOP, SRO	SRV Inadvertently Opens ON-183-001, Technical Specifications
5	cmfMV01_ HV151F02 4A(B)	C – BOP, SRO	Suppression Pool Cooling Valve Breaker Trip OP-149-005, Technical Specifications
6	mfMS1830 10K mfMS1830 13K	C – All	SRV Leaks with Cracked Tailpipe ON-100-101, EO-000-102, EO-000-103
7	mfRP1580 04A(B)(C)(D)	M – All	Electrical ATWS EO-000-102, EO-000-113
8	rfRD15502 2	C – BOP, SRO	CRD Pumps Trip on Low Suction Pressure EO-000-113
9	mfSL1530 01A(B) cmfPM03_ 1P208A(B)	C – BOP, SRO	SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips EO-000-113

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

Facility: **Susquehanna**	Scenario No.: **NRC-3**	Op-Test No.: **2013**
1. Total malfunctions (5-8) **Events 3, 4, 5, 6, 7, 8, 9**	7	
2. Malfunctions after EOP entry (1-2) **Events 8 & 9**	2	
3. Abnormal events (2-4) **Events 3, 4, 5, 6**	4	
4. Major transients (1-2) **Event 7**	1	
5. EOPs entered/requiring substantive actions (1-2) **EO-000-102**	1	
6. EOP contingencies requiring substantive actions (0-2) **EO-000-113**	1	
7. Critical tasks (2-3)	3	
CRITICAL TASK DESCRIPTIONS: **CT-1 – Closes the spuriously open SRV or initiates a manual Reactor scram before Suppression Pool water temperature reaches 110°F.** **CT-2 – Lowers RPV level less than -60" but greater than -161".** **CT-3 – Inserts control rods IAW EO-100-113, Sheet 2, Control Rod Insertion.**		

PPL–SUSQUEHANNA, LLC
LEARNING CENTER

SIMULATOR SCENARIO

TEAM SUSQUEHANNA Generating Excellence

Scenario Title:	**NRC 2013 Scenario #3**
Scenario Duration:	**1.5 hours**
Scenario Number:	**NRC 2013 Scenario #3**
Revision / Date:	**0 / March 27, 2013**
Course:	**Licensed Operator Initial**
Operational Activities:	

Prepared By:	Tom Hooper Instructor	03/27/2013 Date
Reviewed By:	Operations Training Supervisor	4/8/13 Date
Approved By:	Lonnie R. Crawford Jr Supervising Manager/Shift Manager	4/8/13 Date

TEAM SUSQUEHANNA Generating Excellence	**PPL–SUSQUEHANNA, LLC LEARNING CENTER**	
	SIMULATOR SCENARIO	
Scenario Title:	**NRC 2013 Scenario #3**	
Scenario Duration:	**1.5 hours**	
Scenario Number:	**NRC 2013 Scenario #3**	
Revision / Date:	**0 / May 30, 2013**	
Course:	**Licensed Operator Initial**	
Operational Activities:		
Prepared By:	Tom Hooper / Robert A. Thompson	05/30/2013
	Instructor	Date
Reviewed By:	R. Streeper	04/08/2013
	Operations Training Supervisor	Date
Approved By:	Lonnie L. Crawford, Jr.	04/08/2013
	Supervising Manager/Shift Manager	Date

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO SUMMARY

The crew assumes the shift with the plant operating at approximately 90% power. Core Spray pump A is out of service.

The crew will begin by starting EHC pump B and placing EHC pump A in standby per OP-193-003. Then the crew will begin raising Reactor power with Recirculation flow.

During the power ascension, the Reactor pressure regulator will begin to oscillate. Reactor power and pressure will oscillate. The crew will execute ON-156-001, Unanticipated Reactivity Change, ON-178-002, Core Flux Oscillations, and ON-193-001, Turbine EHC System Malfunction. The crew will lower Reactor power. This will suppress the oscillations some. The crew will then lower the load limit and swap pressure regulators to eliminate the oscillations.

Next, SRV K will spuriously open. The crew will execute ON-183-001, Stuck Open Safety Relief Valve. The SRV control switch will not close the valve, however pulling fuses will. Once the valve is closed, the crew will attempt to place Suppression Pool cooling in service. The Suppression Pool cooling valve breaker will trip immediately upon trying to open the valve on the first RHR loop attempted. The SRO will determine the Technical Specification impact. The crew will be able to place Suppression Pool cooling in service with the second loop of RHR.

SRV K will continue to have significant leak-by even once the fuses are pulled. Additionally, the SRV tailpipe will crack. This results in rising Suppression Pool water temperature, air temperature, and pressure. Eventually, vacuum breakers will cycle, causing Drywell temperature and pressure to rise. The crew will execute ON-100-101, Scram, Scram Imminent, to lower Reactor power and attempt a manual scram prior to Drywell pressure exceeding 1.72 psig. Later in the scenario, the crew will mitigate degraded Containment parameters with Suppression Chamber sprays per EO-000-103, Primary Containment Control.

When the crew attempts to scram the Reactor, RPS will fail to de-energize and ARI will fail to function. The crew will enter EO-000-102, RPV Control, and transition to EO-000-113, Level/ Power Control. The crew will lower Reactor power by lowering Recirculation flow, tripping Recirculation pumps, lowering Reactor water level, attempting SLC injection, and inserting control rods. The response will be complicated by failures of SLC and CRD. Upon start of the first SLC pump, the squib valves will fail to fire. If the crew attempts another SLC pump start, the squib valves will fire, but the SLC pump will eventually trip. During the scram, the in-service CRD pump will trip on low suction pressure. The crew will be able to bypass the CRD suction filter, re-start a CRD pump, and drive control rods. After some control rods are driven in, the CRD pumps will trip again on low suction pressure and be lost for the remainder of the scenario.

The crew will be able to insert all control rods by either venting the scram air header or pulling RPS fuses. If the Main Generator is tripped with Drywell pressure above 1.72 psig, load shedding will cause a loss of all Condensate pumps unless the crew has taken action to reset the Main Generator lock-outs. The crew will take action to establish Reactor water level control with RCIC and/or HPCI.

The scenario will be terminated when all control rods are inserted and Reactor water level is being controlled in the assigned band above -161".

The highest expected EAL classification at scenario termination is expected to be Site Area Emergency MS3, based on failure to scram.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO OBJECTIVES

The objective of this scenario is to evaluate the Licensed Operator Candidate's ability to respond to the scenario events. These events will require each candidate to demonstrate the following:

- Knowledge of integrated plant operations
- Ability to diagnose abnormal plant conditions
- Ability to work together as a team
- Ability to mitigate plant transients that exercise their knowledge and use of ONs and EOPs
- Ability to utilize Technical Specifications (SRO Only)

To meet this objective, the Licensed Operator Candidates must demonstrate proficiency in the following competencies:

Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings.
2. Comply with and use procedures, references, and Technical Specifications.
3. Operate the control boards.
4. Communicate and interact with other crew members.

Senior Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings.
2. Comply with and use procedures and references.
3. Operate the control boards (N/A to upgrade candidates).
4. Communicate and interact with the crew and other personnel.
5. Direct shift operations.
6. Comply with and use Technical Specifications.

THIS PAGE IS INTENTIONALLY LEFT BLANK

CRITICAL TASKS

1. Critical Task 1

Closes the spuriously open SRV or initiates a manual Reactor scram before Suppression Pool water temperature reaches 110°F.

NOTE: In this scenario the SRV will remain slightly open after fuses are pulled. Getting the SRV mostly closed by pulling fuses will satisfy the critical task in this scenario, since this action significantly mitigates the malfunction.

Safety Significance

Suppression Pool water temperature must be maintained below 110°F (Boron Injection Initiation Temperature) during Reactor operation to ensure adequate margin is available in an ATWS to shutdown the Reactor before exceeding the Heat Capacity Temperature Limit.

Consequences for Failure to Perform Task

Failure to either close the SRV or initiate a manual Reactor scram before Suppression Pool water temperature reaches 110°F could result in a significant challenge to Primary Containment integrity during an ATWS.

Indications/Cues for Event Requiring Critical Task

SRV open with no valid initiation signal. Suppression Pool water temperature rising.

Performance Criteria

Close the spuriously open SRV by one of the following methods:

- Placing control switch to OFF.
- Cycling control switch to OPEN and then OFF.
- Dispatching a field operator to pull SRV fuses.

OR

Attempt to initiate a manual Reactor scram by one of the following methods:

- Placing the Mode Switch to SHUTDOWN.
- Arming and depressing the RPS manual scram pushbuttons.

Performance Feedback

SRV closure indicated by:

- Acoustic monitor noise lowering.
- Tailpipe temperature lowering.
- Reactor pressure rising.

Manual Reactor scram attempt indicated by:

- Mode Switch position.
- RPS status lights and alarms.
- Lowering Reactor power.

2. Critical Task 2

Lowers RPV level to <-60" but >-161".

Safety Significance

Core damage due to unstable operation can be prevented or at least mitigated by promptly reducing feedwater flow so that level is lowered below the feedwater spargers.

Consequences for Failure to Perform Task

A General Electric Company study (NEDO-32047) indicates that the major threat to fuel integrity from ATWS is caused by large-amplitude power/flow instabilities. The power oscillations can become large enough to cause melting of fuel in high-power bundles.

SSES EOP Basis for:

LQ/L-13 MAINTAIN LVL BETWEEN **-60"** AND **-161"**
USING TABLE 15 SYSTEMS
BYPASSING INTERLOCKS AS NECESSARY IAW ANY:

This step identifies the widest, acceptable water level control band. Although level fluctuations within this band are safe, it is very desirable to maintain level within the more restrictive target area of -110" to -60". The target area and expanded band are shown in Figure 8, Water Level Operation Guidance. The intent of this step is to remain within the target band at all times unless prohibited by system perturbations, and remain within the expanded band at all times.

Operation outside the target area has the following disadvantages:

The basis for an upper level of -60" is given in LQ/L-6.

A lower level of -110" is specified for the following reasons:

1. *Provides a margin for core coverage.*
2. *Avoids operation near TAF where core power is more responsive to RPV pressure fluctuations.*
3. *Makes level control easier by maintaining level above the narrow region of the downcomer.*

   Below -110" the downcomer free area reduces from 300 ft^2 to 88 ft^2 resulting in increased magnitude of indicated level oscillations.
4. *Maintains sufficient core flow to carry liquid boron from lower plenum upward into the core.*

   As level is decreased below -110", boron mixing efficiency is reduced because the natural circulation flow rate through the jet pumps is reduced and not as efficient at carrying the injected boron from the lower plenum upward into the core.

   At very low downcomer water levels near or below top of active fuel, there is little water available in the region above the jet pump throat for mixing with boron injected via RCIC. In this situation, there is concern that boron may accumulate in the stagnant region of the downcomer which is below the jet pump throat.
5. *Water level can be determined from wide range level instrumentation.*
6. *Avoids MSIV isolation setpoint of -129".*

RPV level below TAF is not, by itself, a determination of whether or not level can be maintained > -161". The determination that level cannot be maintained > -161" must be made based upon:

- *availability of high pressure injection systems, and,*
- *present level trend*

This decision must not be made prematurely since depressurization of a critical core results in destabilizing affects and has a potential to cause core damage.

Controlling reactor pressure, power and level with condensate and SRVs at 500 psig is difficult because all 3 parameters affect each other. Therefore, rapid depressurization is recommended when high pressure injection cannot be obtained.

The initial influence of reactor depressurization is stabilizing since the additional flashing of liquid phase required for depressurization introduces excess voids in the reactor core which can essentially terminate the fission process if the rate of depressurization is high enough. Once the depressurization is complete, however, the result is the immediate initiation of power excursions. Core damage is expected to occur from high clad stresses induced by: temperature excursions above the rewet temperature, PCI, cyclic fatigue, burnout or having the fuel enthalpy exceed the cladding failure threshold.

Indications/Cues for Event Requiring Critical Task

ATWS with initial reactor power level greater than 5% APRM power.

Performance Criteria

Lower reactor water level by manually controlling injection rate from Feedwater, HPCI and/or RCIC.

Performance Feedback

Lowering water level to –60 to –110 inches will result in power level lowering as indicated on the Average Power Range Monitors.

3. Critical Task 3

Inserts control rods IAW EO-100-113 Sheet 2.

Safety Significance

Control rod insertion initiates power reduction immediately

Consequences for Failure to Perform Task

Failure to insert control rods allows power to remain elevated with resultant power oscillations and potential core damage.

Indications/Cues for Event Requiring Critical Task

Exceeding a RPS scram setting with NO reactor scram signal, or RPS/ARI fail to fully insert all control rods.

Performance Criteria

Insert Control Rods by one or more of the following methods:
Maximize CRD to drift control rods.
Drive control rods after bypassing RWM and RSCS.
Reset and Scram again by performing ES-158-002 Bypass RPS logic trips.
De-energizing RPS solenoids by performing ES-158-001.
Local venting of Scram Air Header.

erformance Feedback

Successful insertion of control rods will be indicated by:

Rod position full in indication for manual insertion of control rods, venting scram air header or de-energizing RPS solenoids.

Rod position full in after resetting scram, draining scram discharge volume and re-scram.

SCENARIO MALFUNCTIONS

Malfunction	Description	Crew Response
1	EHC Oscillations	Lower Reactor power, lower load limit, place alternate pressure regulator in service
2	SRV Inadvertently Opens	Pull SRV fuses, attempt to place Suppression Pool cooling in service, determine Tech Spec impact
3	Suppression Pool Cooling Valve Breaker Trip	Place alternate loop of Suppression Pool cooling in service, determine Tech Spec impact
4	SRV Leaks with Cracked Tailpipe	Lower Reactor power, scram the Reactor , initiate Suppression Chamber spray
5	Electrical ATWS	Lower Recirculation flow, trip Recirculation pumps, lower Reactor water level, insert control rods
6	CRD Pumps Trip on Low Suction Pressure	Bypass CRD suction filter, re-start CRD pump
7	SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips	Attempt to start alternate SLC pump, lineup alternate boron injection, control Reactor power with alternate means

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO REFERENCES

1.	OP-193-003	MAIN TURBINE EHC OIL SYSTEM
2.	GO-100-012	POWER MANEUVERS
3.	ON-156-001	UNANTICIPATED REACTIVITY CHANGE
4.	ON-178-002	CORE FLUX OSCILLATIONS
5.	ON-193-001	TURBINE EHC SYSTEM MALFUNCTION
6.	TS 3.7.8	MAIN TURBINE PRESSURE REGULATION SYSTEM
7.	ON-183-001	STUCK OPEN SAFETY RELIEF VALVE
8.	TS 3.4.3	SAFETY/RELIEF VALVES (S/RVs)
9.	EO-000-103	PRIMARY CONTAINMENT CONTROL
10.	OP-149-005	RHR SUPPRESSION POOL COOLING
11.	OP-054-001	EMERGENCY SERVICE WATER SYSTEM
12.	OP-116-001	RHR SERVICE WATER
13.	ON-100-101	SCRAM, SCRAM IMMINENT
14.	EO-000-102	RPV CONTROL
15.	EO-000-113	LEVEL/POWER CONTROL
16.	OP-145-001	RFP AND RFP LUBE OIL SYSTEM
17.	OP-153-001	STANDBY LIQUID CONTROL SYSTEM
18.	OP-155-001	CONTROL ROD DRIVE HYDRAULIC SYSTEM
19.	OP-150-001	RCIC SYSTEM
20.	OP-152-001	HPCI SYSTEM
21.	OP-184-001	MAIN STEAM SYSTEM
22.	OP-160-001	DRYWELL VENTILATION SYSTEM
23.	OP-149-004	RHR CONTAINMENT COOLING

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO SPECIAL INSTRUCTIONS

1. Simulator setup
   a. **Initialize** to IC–378
   b. **Run** SCN file **n13scen3.scn**
2. **Place** the simulator in RUN
3. **Verify** the following malfunctions/overrides, event triggers and key assignments:

MF	RF	OR	SCN	ET	CONDITIONS	KEYS
10:10	**1:1**	**0:0**	**0**	**6:0**	**22**	**12**

4. **Prepare** the simulator for evaluation
   a. **Complete** a simulator exam checklist, NTP–QA–31.10 Attachment B
   b. **Place** a tag on Core Spray pump A.
   c. **Prepare** a Reactivity Manipulation Package for raising Reactor power from 90% to 100% with recirculation flow.
5. **Prepare** a Turnover Sheet including the following:
   a. Swap EHC pumps per OP-193-003.
   b. Then raise Reactor power with Recirculation flow to 100% per GO-100-012 section and Reactivity Manipulation Package.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO FILES

n13scen3.scn

```
; Monitored parameters
SCN rat_mp
SCN n13scen3mp

; Core Spray Pump A OOS
IRF crfPM13_1P206A

; Reactor power ~90%

; Crew swaps EHC pumps from A to B

; Crew begins raising power from 90% to 100%

; EHC oscillations
{Key[1]} SCN n13scen3_1

; Dampen oscillation when crew takes action to open TBV
{Key[11]} SCN n13scen3_1C

; Place EHC regulator B in service and delete oscillation
{Key[21]} IOR aiM2HHD702 r:30 f:.6

; SRV K inadvertently opens and control switch will not close it
{Key[2]} IMF cmfRV04_PSV141F13K f:100

; NPO pulls SRV K fuses in relay room, SRV K closes but leaks by
{Key[12]} IMF cmfRV08_PSV141F13K
{Key[12]} DMF cmfRV04_PSV141F13K
{Key[12]} IMF mfMS183010K f:8

; Suppression Pool cooling valve breaker trips on first loop attempted
aet n13scen3et3
aet n13scen3et13

; SRV K tailpipe cracks in Supp Chamber
{Key[22]} IMF mfMS183013K r:15 f:10

; Electrical ATWS
IMF mfRP158004A
IMF mfRP158004B
IMF mfRP158004C
IMF mfRP158004D
IMF mfRP158003
IMF cmfRL01_63X114725D1
IMF cmfRL01_63X214725D1

; CRD pumps trip on low suction pressure when CRD FCV is taken to MAN,
; due to "suction filter clogging"; also CRD FCV output is throttled to prevent
; drifting in control rods
aet n13scen3et1

; NPO bypasses CRD suction filter
{Key[5]} IRF rfRD155028 f:100

; CRD pumps trip on low suction pressure again
{Key[15]} IRF rfRD155028 f:5

; SLC squibs fail to fire with first pump started; second pump started allows
; squibs to fire, but pump has shaft shear; first pump will not restart
IMF mfSL153001A
IMF mfSL153001B
aet n13scen3et9
```

```
aet n13scen3et19

; NPO pulls RPS A fuses in upper relay room
{Key[10]} IMF cmfFU01_1C609F18C
{Key[10]} IMF cmfFU01_1C609F18G d:5
{Key[10]} IMF cmfFU01_1C609F18A d:15
{Key[10]} IMF cmfFU01_1C609F18E d:20

; NPO pulls RPS B fuses in lower relay room
{Key[20]} IMF cmfFU01_1C611F18D
{Key[20]} IMF cmfFU01_1C611F18H d:5
{Key[20]} IMF cmfFU01_1C611F18B d:15
{Key[20]} IMF cmfFU01_1C611F18F d:20

; NPO vents scram air header
{Key[30]} IRF rfRD155018 f:100
{Key[30]} IRF rfRD155025 d:5 f:0
{Key[30]} IRF rfRD155016 d:10 f:100

; NPO closes charging water header isolation
{Key[7]} IRF rfRD155017 f:0

; SRV tailpipe break gets worse once Supp Chamber sprays are in service
aet n13scen3et25
```

n13scen3_1.scn

```
IMF cmfTR03_PT10101A f:20
+10 MMF cmfTR03_PT10101A f:10
+10 MMF cmfTR03_PT10101A r:10 f:0
scn n13scen3_1A
```

n13scen3_1A.scn

```
10 MMF cmfTR03_PT10101A r:10 f:10
+10 MMF cmfTR03_PT10101A r:10 f:0
scn n13scen3_1B
```

n13scen3_1B.scn

```
+10 MMF cmfTR03_PT10101A r:10 f:10
+10 MMF cmfTR03_PT10101A r:10 f:0
scn n13scen3_1A
```

n13scen3_1C.scn

```
MMF cmfTR03_PT10101A r:10 f:6
+10 MMF cmfTR03_PT10101A r:10 f:0
scn n13scen3_1D
```

n13scen3_1D.scn

```
+10 MMF cmfTR03_PT10101A r:10 f:6
+10 MMF cmfTR03_PT10101A r:10 f:0
+10 scn n13scen3_1C
```

n13scen3et1.et

```
;SWITCH:CRD FLOW CONTROLLER  (MANUAL,AUTO)
diFCC121R600D.CurrValue = #OR.diFCC121R600D.MANUAL
```

n13scen3et1.scn

```
IRF rfRD155020 f:6
IRF rfRD155022 f:5
```

n13scen3et3.et

```
;SWITCH:SUPP POOL CLG/TEST CTL HV-1F024A (E11A-S12A)
 HS15124A.CurrValue = #OR.diHS15124A.OPEN
```

n13scen3et3.scn

```
IMF cmfMV01_HV151F024A
cet n13scen3et13
```

n13scen3et9.et
```
;SWITCH:SBLC MANUAL INITIATION
diHSS14804.CurrValue = #OR.diHSS14804.START_A
```

n13scen3et9.scn
```
aet n13scen3et29
```

n13scen3et13.et
```
;SWITCH:SUPP POOL CLG/TEST CTL HV-1F024B (E11A-S12B)
diHS15124B1.CurrValue = #OR.diHS15124B1.OPEN
```

n13scen3et13.scn
```
IMF cmfMV01_HV151F024B
cet n13scen3et3
```

n13scen3et19.et
```
;SWITCH:SBLC MANUAL INITIATION
diHSS14804.CurrValue = #OR.diHSS14804.START_B
```

n13scen3et19.scn
```
aet n13scen3et29
```

n13scen3et25.et
```
;METER:DRYWELL SUPP CHMB FLOW
aoFI15120AB.CurrValue >= 200 | aoFI15120BB.CurrValue >= 200
```

n13scen3et25.scn
```
IMF mfMS183013K r:60 f:20
```

n13scen3et29.et
```
;SWITCH:SBLC MANUAL INITIATION
diHSS14804.CurrValue = #OR.diHSS14804.STOP
```

n13scen3et29.scn
```
DMF mfSL153001A
DMF mfSL153001B
{Key[9]} imf cmfPM03_1P208A
{Key[19]} imf cmfPM03_1P208B
```

n13scen3mp.scn
```
insmp aoTRSB211R614C.CurrValue
changemp aoTRSB211R614C.CurrValue 0,600,DEG F,ADS VALVE 1F013KTAILPIPE TEMP
```

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT DESCRIPTION FORM

Initial Conditions: Ensure shift positions are assigned, have the Crew conduct the turnover and perform a panel walk down before the start of the scenario.

EVENT	OP EVENT / TASK	TIME	DESCRIPTION
N/A	N/A	0	Crew assumes shift
1	N/A	5	Swap EHC Pumps
2	N/A	10	Raise Reactor Power with Recirculation Flow
3	N/A	20	EHC Oscillations
4	N/A	30	SRV Inadvertently Opens
5	N/A	40	Suppression Pool Cooling Valve Breaker Trip
6	N/A	50	SRV Leaks with Cracked Tailpipe
7	N/A	60	Electrical ATWS
8	N/A	70	CRD Pumps Trip on Low Suction Pressure
9	N/A	70	SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips
N/A	N/A	90	Termination

SCENARIO EVENT FORM

EVENT	1
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Swap EHC Pumps

POSITION	TIME	STUDENT ACTIVITIES
SRO		Directs BOP to start EHC pump B and secure EHC pump A per OP-193-003 section 2.9.
ATC		Monitors plant parameters.
BOP		Starts EHC pump B and secures EHC pump A per OP-193-003 section 2.9: • Station an Operator locally to observe EHC Pump Discharge pressure at PI10180B. • Start 1P113B EHC HYD FLUID PUMP by Depressing RUN pushbutton. • Observe EHC Pump 1P113B discharge pressure on local gage PI10180B rises to ~ 1500-1700 psig. • WHEN EHC System pressure stabilizes, Stop EHC HYD FLUID PUMP 1P113A by Depressing AUTO pushbutton, AND then STOP pushbutton. • Place EHC HYD FLUID PUMP 1P113A in standby by Depressing AUTO pushbutton. • Verify discharge pressure using Computer Point TLP03 ≈ 1625 psig. • IF necessary, Adjust EHC Pump discharge pressure using procedure section titled "Adjusting EHC Pump Discharge Pressure."

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	1
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Swap EHC Pumps

INSTRUCTOR ACTIVITY

1. None

ROLE PLAY

If asked as **NPO** before the pump swap, immediately report that the area is clear of unnecessary personnel and you are ready for the swap.

If asked as **NPO** after the breaker swap, immediately report that you have a good start on EHC pump B and a good stop on EHC pump A. If asked, immediately report local discharge pressure reads approximately 1625 psig.

Role play any other directed actions as required.

EVALUATOR NOTES

1. None

SCENARIO EVENT FORM

EVENT	2
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Raise Reactor Power with Recirculation Flow

POSITION	TIME	STUDENT ACTIVITIES
SRO		Directs ATC to raise Reactor power to 100% with recirculation flow per GO-100-012 and the Reactivity Manipulation Package. Provides oversight for reactivity manipulation.
ATC		Raises recirculation flow by controlling two Reactor Recirc Pumps in MANUAL mode: <u>MANUAL mode:</u> • Slowly Adjust REACTOR RECIRC PUMP A(B) SPEED SY-B31-1R621A(B) Controller Demand with the applicable DEC pushbuttons as required. Monitors diverse indications: • APRMs • Core thermal power • Main Generator output • Reactor water level • Reactor pressure • Recirc pump speeds • Recirc pump flows • Total core flow Plots all Reactor power changes on Power/Flow Map.
BOP		Monitors plant parameters. Provides peer checks for reactivity manipulation.

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	2
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Raise Reactor Power with Recirculation Flow

INSTRUCTOR ACTIVITY

1. None

ROLE PLAY

Role play any directed actions as required.

EVALUATOR NOTES

1. Recirculation Loop Jet Pump mismatch shall be maintained ≤ 5 million lbm/hr when operating at ≥ 75 million lbm/hr total core flow.
2. OP-164-002 Attachment A provides the expectation that power ascensions above 60% power will be performed with two Recirculation pump in the MANUAL mode until Power Ramp is reached (per this scenario's reactivity instructions – 98%).
3. Once a sufficient power change has been observed, proceed to the next event (recommended by 95%).

SCENARIO EVENT FORM

EVENT	3
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	EHC Oscillations

POSITION	TIME	STUDENT ACTIVITIES
Team		Recognizes / reports: • Reactor power and pressure oscillating • Turbine Control Valves oscillating • Annunciator AR-105-001 (I06), Main Turbine Bypass Valves Open
SRO		May enter ON-156-001, Unanticipated Reactivity Change. May enter ON-178-002, Core Flux Oscillations. Enters ON-193-001, Turbine EHC System Malfunction. Provides oversight for power reduction. May reference Technical Specification 3.7.8 for thermal limits without a backup pressure regulator.

ATC		Executes ON-193-001, Turbine EHC System Malfunction:
		• Determine Turbine Control Valves are oscillating > 2% and proceed to section 3.4.
		• Reduce reactor power with recirculation flow until EITHER of following reached:
		  o Reactor power reduction of 5% (65 MWe)
		  OR
		  o Core flow reduced to value specified IAW RE Instructions in CRC Book.
		• Perform following to stop Control Valve oscillations:
		  o Note the Setpoint of the LOAD LIMIT SET potentiometer.
		  o Using LOAD LIMIT SET potentiometer, Unlock and Lower setting until LOAD LIMIT LIGHT ILLUMINATES.
		  o Continue to Slowly Lower LOAD LIMIT SET potentiometer setting until sufficient bypass valves are open to stop Control Valve oscillations.
		  o Check Control Valve oscillations STOP.
		  o Lock the LOAD LIMIT SET potentiometer.
		• Observe any of the following Main Turbine PRESSURE SET PT/MAIN STEAM PRESSURE A or B indications for evidence of oscillations.
		  o Main Turbine PRESSURE SET PT/MAIN STEAM PRESSURE A or B Meter(s) on 1C651.
		  o TRA Points 190(191) Pressure Regulator A(B) Setpoint.
		  o TRA Points 192(193) Pressure Regulator A(B) Sensed Pressure.

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	3
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	EHC Oscillations

INSTRUCTOR ACTIVITY

1. When directed by lead examiner, **depress KEY 1** to initiate event:

   {Key[1]} SCN n13scen3_1

2. When the crew initiates a power reduction, **ABORT n13scen3_1A or n13scen3_1B (whichever is currently active), then depress Key 11** to reduce the severity of the oscillations.

   {Key[11]} SCN n13scen3_1C

3. When the crew requests swapping pressure regulators, wait 2 minutes, **then depress KEY 21** to place pressure regulator B in service.

   {Key[21]} IOR aiM2HHD702 r:30 f:.6

ROLE PLAY

If dispatched as I&C to check EHC, wait 3 minutes, then report:

"It appears that the in-service pressure regulator is causing oscillations."

As **NPO/I&C** dispatched to swap pressure regulators, wait 2 minutes, then depress KEY 21 as stated above, and report:

"Pressure regulator B is now in service."

As **WWM** (or equivalent) contacted for assistance with troubleshooting/repairing pressure regulator A, acknowledge request and report that you will engage the organization.

Role play any other directed actions as required.

EVALUATOR NOTES

1. None

SCENARIO EVENT FORM

EVENT	3
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	EHC Oscillations

POSITION	TIME	STUDENT ACTIVITIES
ATC (cont)		• IF oscillations observed AND I&C NOT available, at Turbine EHC Cabinet 1C663, Place Pressure Regulator B or A in control performing Steps 3.4.5 or 3.4.6, as applicable. • Dispatches operator/I&C to place Pressure Regulator B in control. • Using LOAD LIMIT SET potentiometer, Raise setting until #1 BYPASS VALVE CLOSES. • Return LOAD LIMIT SET potentiometer to setting recorded previously.
BOP		Monitors plant parameters.

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT FORM

EVENT	4
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	SRV Inadvertently Opens

POSITION	TIME	STUDENT ACTIVITIES
★		**Closes the spuriously open SRV or initiates a manual Reactor scram before Suppression Pool water temperature reaches 110°F.**
Team		Recognizes / reports: • Annunciator AR-110-001 (E02), Main Steam Div 1 SRV Open • SRV K acoustic monitor in alarm • Reactor pressure lowers • Suppression Pool temperature rising
SRO		Enters ON-183-001, Stuck Open Safety Relief Valve. May enter EO-000-103, Primary Containment Control, on high Suppression Pool temperature. Declares SRV K inoperable for the relief function. Reviews SR 3.6.1.6.1 and 3.6.1.6.2 and determines 2 hour and 12 hour requirements, respectively, for closing SRV and testing functionality. Determines Technical Specification 3.4.3 is still met with only one SRV inop. Determines Technical Specification 3.5.1 is still met since ADS function of SRV K is still operable (pulling fuses only inops pressure relief function due to plant design). Determines Technical Specification 3.6.2.1 Condition A requires restoring Suppression Pool temperature less than 90°F within 24 hours.
ATC		Monitors plant parameters.

BOP		Executes ON-183-001, Stuck Open Safety Relief Valve:
		• Immediately Scram Reactor for ANY of the following:
		    o It is evident SRV WILL NOT close.
		    o SRV is open AND BEFORE suppression pool temperature reaches 110°F. (TS 3.6.2.1)
		• Determine SRV K is NOT open due to high pressure
		• Place SRV K control switch to OFF.

★ Denotes Critical Task

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	4
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	SRV Inadvertently Opens

INSTRUCTOR ACTIVITY

1. When directed by lead examiner, **depress KEY 2** to initiate event.

   {Key[2]} IMF cmfRV04_PSV141F13K f:100

2. When requested to pull SRV K fuses, wait 2 minutes, ensure the lead examiner is ready for the SRV to close (Suppression Pool temperature approaching or above 90°F), then **depress KEY 12 (also sticks SRV K 8% open)**.

   {Key[12]} IMF cmfRV08_PSV141F13K
   {Key[12]} DMF cmfRV04_PSV141F13K
   {Key[12]} IMF mfMS183010K f:8

ROLE PLAY

As **NPO** dispatched to pull fuses for SRV K, wait 2 minutes, then **depress KEY 12** as described above, and **report,**

> **"SRV K fuses have been pulled."**

As **WWM** (or equivalent) contacted for assistance with SRV K, acknowledge request.

Role play any other directed actions as required.

EVALUATOR NOTES

1. Placing the control switch in OFF and cycling it will not close SRV K. This drives the crew to pull fuses.
2. The SRV fuses should not be pulled until Suppression Pool temperature is approaching or above 90°F to ensure the crew is motivated to place Suppression Pool cooling in service.
3. The crew will discover the next event when they attempt to place Suppression Pool cooling in service.
4. While it satisfies the critical task, it is not expected that the crew will attempt a manual Reactor scram on this event prior to partially closing SRV K by pulling fuses.
5. When the SRV fuses are pulled, the SRV will partially close (to approximately 8% open). This will combine with a tail pipe crack during Event 6 to cause rising Suppression Chamber and Drywell pressure. If the crew quickly diagnoses failure of SRV K to fully close, they may scram prior to placing Suppression Pool cooling in service. Further Primary Containment control actions will then likely be performed following the ATWS response.

SCENARIO EVENT FORM

EVENT	4
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	SRV Inadvertently Opens

POSITION	TIME	STUDENT ACTIVITIES
BOP (cont)		• Determine SRV K did NOT close by evaluating following: o On Panel 1C601 vertical board, Check Acoustic Monitor red light EXTINGUISHED. o On Panel 1C690A(B), Check MSRVs Acoustic Monitor VISH-14180A1(B1) through VISH-14180A8(B8) green lights EXTINGUISHED. o On Panel 1C614, Check SRV/ADS Temp Recorder TRS-B21-1R614 for temperature decrease. o Check RPV pressure and pressure trend o Check generator MWE and reactor MWTH. o Check RPV level trend recorder, Panel 1C652, Recorder XR-10602, for indication of level shrink that shows SRV closing. • Perform the following: o Obtain concurrence from Shift Supervision, THEN Place the affected SRV control switch to OPEN. o Return SRV control switch to OFF. o Determine SRV K did NOT close. o As directed by Shift Supervision, Repeat steps 3.5.1 through 3.5.3 until evident SRV will not close, AND/OR Continue with next step. • IF SRV did NOT close when control switch was placed in OFF, attempt to Close SRV by removal of fuses per Attachment A for affected SRV as follows: o **Directs NPO to pull fuses at 1C628 (12/754') and Verify:** ▪ Check for SRV CLOSURE IAW Section 3.4 of this procedure. ▪ IF SRV closure successful, Leave fuses removed and Apply SCT. • Determines / reports SRV K closed by fuse removal. • IF NOT required for adequate core cooling, Place at least one loop of RHR in Suppression Pool Cooling Mode in accordance with OP-149-005. • WHEN all SRVs are closed, Comply with TS 3.6.1.6 by performing SO-159-002.

NOTES	

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT FORM

EVENT	5
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Suppression Pool Cooling Valve Breaker Trip

POSITION	TIME	STUDENT ACTIVITIES
SRO		Acknowledges failure of Suppression Pool cooling valve(s) HV-151-F024A(B). Determines one or both subsystems of Suppression Pool cooling is inoperable. When informed of one subsystem of Suppression Pooling cooling inoperable, determines Technical Specification 3.6.2.3 Condition A requires restoring operability within 7 days.
ATC		Monitors plant parameters.
BOP		Attempts to place Suppression Pool cooling in service per OP-149-005: • May contact Radwaste regarding ability to take water. • Place Emergency Service Water System in operation in accordance with OP-054-001 supplying RHR Room Cooler and RHR Pump to be placed in service: o Place ESW Loop A(B) in service by depressing ESW Pump 0P504A(C)(0P504B(D)) RUN pushbutton. o Ensure OPEN: ▪ HV-01222A(B) ESW Pond Spr Bpv A(B). OR ▪ HV-01224A1(B1) ESW Pond Spr In A1(B1). AND/OR ▪ HV-01224A2(B2) ESW Pond Spr In A2(B2). o On Panel 0C681, Ensure ESW Pp Supply Fan 0V521A(C)(0V521B(D)) STARTS. o Ensure ventilation damper alignment in accordance with OP-128-001. o May start additional pumps as required.

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	5
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Suppression Pool Cooling Valve Breaker Trip

INSTRUCTOR ACTIVITY

1. If RHR loop A is attempted first, verify automatic event trigger n13scen3et3 initiates to trip breaker for RHR A Suppression Pool cooling breaker and clear the automatic event trigger for RHR loop B.

2. If RHR loop B is attempted first, verify automatic event trigger n13scen3et13 initiates to trip breaker for RHR B Suppression Pool cooling breaker and clear the automatic event trigger for RHR loop A.

ROLE PLAY

As **NPO** dispatched to investigate valve failure, wait 2 minutes and **report**,

"The valve breaker is tripped and the valve appears to be closed."

As **NPO** dispatched manually open valve, wait 2 minutes and **report**,

"The valve is stuck closed."

If asked as **Radwaste** about capacity to take on water, **report**,

"There is not enough capacity in Radwaste tanks right now."

As **WWM** (or equivalent) contacted for assistance with valve failure(s), acknowledge request.

Role play any other directed actions as required.

EVALUATOR NOTES

1. Only the first RHR loop attempted will have the Suppression Pool cooling valve breaker trip. The second loop can be successfully placed in Suppression Pool cooling.
2. The next event should be inserted once a loop of Suppression Pool cooling is successfully in service.

SCENARIO EVENT FORM

EVENT	5
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Suppression Pool Cooling Valve Breaker Trip

POSITION	TIME	STUDENT ACTIVITIES

BOP (cont)		• Place RHR Service Water System in service to RHR Heat Exchanger A(B) in accordance with OP-116-001:
		  o Inform SRO to comply with TRO 3.8.2.1.
		  o At 0C697 Motor Overload Bypass Control Panel, Place HS-11210A1 (HS-11210B3) RHRSW Sys Unit 1 Div 1(2) to TEST.
		  o Ensure HV-21210A(B) Unit 2 RHRSW Hx A(B) Inlet CLOSED.
		  o Open HV-11210A(B) Unit 1 RHRSW Hx A(B) Inlet to 10% OPEN.
		  o Open HV-11215A(B) Unit 1 RHRSW Hx A(B) Outlet.
		  o Ensure OPEN
		    ▪ HV-01222A(B) ESW Pond Spr Bpv A(B)
		    OR
		    ▪ HV-01224A1(B1) ESW Pond Spr In A1(B1)
		    AND/OR
		    ▪ HV-01224A2(B2) ESW Pond Spr In A2(B2).
		  o Start 1P506A(B) RHRSW Pump A(B).
		  o Throttle HV-11210A(B) Unit 1 RHRSW Hx A(B) Inlet to establish 6000 to 9000 gpm on FI-1R602A(B) RHRSW Hx A(B) Inlet Flow.
		  o Ensure proper operation of the A(B) RHRSW Rad Monitor by observing the following alarms not ANNUNCIATED:
		    ▪ AR109(F01) (AR113(F01))
		    ▪ AR109(F02) (AR113(F02))
		  o IF Unit 1 LOCA signal not present:
		    ▪ Place HS-11202A3(B3) RHRSW Pump A(B) Loca Trip to ENABLE.
		    ▪ Observe White Indicating Light ILLUMINATED.
		
		• Ensure TRO 3.8.2.1 entered before placing MOV OL BYPS keyswitch to test in the next step.
		• Place HS-E11-1S62A(B) RHR LOOP A(B) MOV OL BYPS keyswitch to TEST.
		  o Confirm BIS Status Light RHR LOOP A(B) MOVS IN TEST ILLUMINATES.
		  o Confirm RHR LOOP A(B) OUT OF SERVICE ANNUNCIATOR ALARMS.
		• Open HV-151-F028A(B) SUPP CHMBR SPR TEST SHUTOFF.
		• Check RHR System filled and vented in accordance with OP-149-001.
		• Start RHR PUMP 1P202A(B)(C)(D).
		• To adjust RHR flow, Throttle As Necessary HV-151-F024A(B) TEST LINE CTL to maintain < 10,000 gpm as indicated on RHR A/C(B/D)FLOW FI-E11-1R603A(B).

SCENARIO EVENT FORM

EVENT	5
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Suppression Pool Cooling Valve Breaker Trip

POSITION	TIME	STUDENT ACTIVITIES
BOP (cont)		Recognizes / reports Suppression Pool cooling valve(s) HV-151-F024A(B) failed to open and lights de-energized. Dispatches NPO to investigate HV-151-F024A(B) failure and check breaker 1B237-034 (1B247-05). May attempt to place other loop of Suppression Pool cooling in service, as time allows.

SCENARIO EVENT FORM

EVENT	6
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	SRV Leaks with Cracked Tailpipe

POSITION	TIME	STUDENT ACTIVITIES
TEAM		Recognizes / reports: • Suppression Chamber water temperature rises. • Suppression Chamber pressure rises. • Suppression Chamber to Drywell vacuum breakers cycle. • Drywell temperature and pressure rise.
SRO		Enters ON-100-101, Scram, Scram Imminent. Directs Scram Imminent actions. Provides oversight for reactivity manipulation. May enter / re-enter EO-000-103, Primary Containment Control, on high Drywell temperature and/or pressure. Directs manual Reactor scram. Acknowledges failure to scram.
ATC		Executes Scram Imminent actions of ON-100-101, Scram, Scram Imminent: • Reduce Reactor Power in accordance with RE Instructions in CRC Book. o When required, Reduce Rx Core Flow as follows: ▪ IF not in the Manual Mode, on the RRP DUAL SCRN HMI screen, Touch the Rx Recirc Pump A & B EXIT TO MANUAL buttons. ▪ Initiate the required flow/power reduction by performing either of the following: • Initiate a Manual Rx Recirc Limiter #2 Runback in accordance with OP-164-001. OR • Adjust the double chevron DEC buttons on the REACTOR RECIRC PUMP A(B) SPEED controllers SY-B31-1R621A & B as required to establish the final Core Flow value stated in the CRC Book.

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENT	6
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	SRV Leaks with Cracked Tailpipe

INSTRUCTOR ACTIVITY

1. When directed by lead examiner, **depress KEY 22** to initiate event.

   {Key[22]} IMF mfMS183013K r:15 f:10

ROLE PLAY

As **WWM** (or equivalent) contacted for assistance, acknowledge request.

Role play any other directed actions as required.

EVALUATOR NOTES

1. Additional BOP actions for this event are scripted in the following events, as the failure to scram will divert crew resources for a period of time.

SCENARIO EVENT FORM

EVENT	6
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	SRV Leaks with Cracked Tailpipe

POSITION	TIME	STUDENT ACTIVITIES
ATC (cont)		Executes scram actions of ON-100-101, Scram, Scram Imminent: • Place Mode Switch in SHUTDOWN. • Arm and depress manual scram pushbuttons (4). Recognize / report failure to scram.
BOP		Monitors plant parameters. Initiate ARI by arming and depressing: • ARI DIV 1 MAN TRIP HS-147103A1 TRIP • ARI DIV 2 MAN TRIP HS-147103B1 TRIP

IOTES	

THIS PAGE IS INTENTIONALLY LEFT BLANK

SCENARIO EVENT FORM

EVENTS	7, 8, & 9
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Electrical ATWS, CRD Pumps Trip on Low Suction Pressure, SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips

POSITION	TIME	STUDENT ACTIVITIES
★		**Lowers RPV level less than -60" but greater than -161".** **Insert control rods IAW EO-100-113 Sheet 2.**
Team		Recognizes / reports failure to scram.

SRO		Enters EO-000-102, RPV Control, on high power and/or high Drywell pressure.
		
		Exits EO-000-102 and enters EO-000-113, Level/Power Control:
		• Directs ARI initiated.
		• Records initial ATWS power level.
		• Executes Power Leg:
		  o Answers, "Is initial ATWS pwr >5% or cannot be determined?" Yes
		  o Directs SLC injection.
		  o Directs ADS inhibited.
		  o Ensures RWCU isolated.
		  o Ensures SRMs and IRMs inserted.
		  o Directs Recirc run back to minimum.
		  o Directs Recirc pumps tripped.
		  o Direct CRD maximized.
		  o Enters EO-000-113 sheet 2 for control rod insertion:
		    ▪ Answers, "Is more than 1 control rod >00?" Yes.
		    ▪ Determines ATWS is electrical.
		    ▪ **Directs control rod insertion by pulling RPS fuses and/or venting scram air header.**
		• Executes Level Leg:
		  o Directs verification of isolations and initiations.
		  o Answers, "Is initial ATWS pwr >5% or cannot be determined?" Yes
		  o Directs overriding RCIC and HPCI injection
		  o **Directs injection throttled and prevented until level between -60" and -110".**
		  o Directs bypassing of MSIV and CIG interlocks.
		  o **Directs Reactor water level controlled -60" to -161" using Table 15 systems (SLC, FW, Cond, CRD, HPCI, RCIC, LPCI).**
		• Executes Pressure Leg:
		  o Directs Reactor pressure controlled 800-1050 psig using Turbine Bypass Valves.

★ Denotes Critical Task

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENTS	7, 8, & 9
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Electrical ATWS, CRD Pumps Trip on Low Suction Pressure, SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips

INSTRUCTOR ACTIVITY

1. When Suppression Chamber spray is placed in service, verify automatic event trigger n13scen3et25 initiates and ramps up the SRV tailpipe crack severity to 20% over 1 minute.

2. When CRD flow control valve is placed in MAN, verify automatic event trigger n13scen3et1 initiates and causes CRD pump trip on low suction pressure.

3. When requested to bypass CRD suction filter, wait 3 minutes, then depress Key 5:

   {Key[5]} IRF rfRD155028 f:100

4. When crew has restarted CRD pump(s) and directed by lead examiner, depress Key 15 to trip CRD pumps again on low suction pressure:

   {Key[15]} IRF rfRD155028 f:5

5. When the first SLC pump is started, verify automatic event trigger 9 or 19 initiates. Then when the SLC keylock is taken to OFF, verify automatic event trigger 29 initiates and sets up Keys 9 and 19.

6. When the crew subsequently starts another SLC pump and directed by lead examiner, depress Key 9 or 19, as required, to trip the running SLC pump:

   {Key[9]} imf cmfPM03_1P208A
   {Key[19]} imf cmfPM03_1P208B

7. When requested to pull RPS fuses, wait until given permission from lead examiner, then **depress Keys 10 and 20** as described in role play below (and when directed to re-install fuses, immediately delete these malfunctions):

   {Key[10]} IMF cmfFU01_1C609F18C / {Key[10]} IMF cmfFU01_1C609F18G d:5
   {Key[10]} IMF cmfFU01_1C609F18A d:15 / {Key[10]} IMF cmfFU01_1C609F18E e:20
   {Key[20]} IMF cmfFU01_1C611F18D / {Key[20]} IMF cmfFU01_1C611F18H d:5
   {Key[20]} IMF cmfFU01_1C611F18B d:15 / {Key[20]} IMF cmfFU01_1C611F18F d:20

8. When requested to vent scram air header, wait until given permission from lead examiner, then **depress Key 30**:

   {Key[30]} IRF rfRD155018 f:100 / {Key[30]} IRF rfRD155025 d:5 f:0
   {Key[30]} IRF rfRD155016 d:10 f:100

9. If requested to close CRD charging water header isolation valve, wait 2 minutes, depress Key 7, then report task completion:

   {Key[7]} IRF rfRD155017 f:0

INSTRUCTOR ACTIVITIES / ROLE PLAY / NOTES

EVENTS	7, 8, & 9
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Electrical ATWS, CRD Pumps Trip on Low Suction Pressure, SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips

ROLE PLAY

As **NPO** dispatched to bypass the CRD suction filter, wait 3 minutes, then **depress Key 5** as described earlier and report:

> **"146F116, CRD suction filter bypass valve, is open."**

As **NPO** dispatched to pull RPS fuses, wait at least 2 minutes and obtain lead examiner permission, then report,

> **"I am about to pull RPS Channel A fuses, expect BACKUP/GROUP SYSTEM A POWER FAILURE alarms on 1C651."**
>
> Then **depress Key 10** as described above. Wait one minute, then report,
>
> **"I am about to pull RPS Channel B fuses, expect BACKUP/GROUP SYSTEM B POWER FAILURE alarms on 1C651."**
>
> Then **depress Key 20** as described above and report,
>
> **"The RPS fuses have been pulled per ES-158-001."**

As **NPO** dispatched vent scram air header, wait at least 3 minutes and obtain lead examiner permission. Contact the crew and report you are ready to vent the scram air header. When given permission **depress Key 30** as described above and report,

> **"The scram air header has been depressurized."**

Role play any other directed actions as required.

EVALUATOR NOTES

1. CRD Flow Control Valve outlet flow is throttled to prevent the crew from being able to drift in control rods and end the ATWS early. This also lowers drive water differential pressure, which may limit ability to drive control rods manually.
2. Once the crew has bypassed the CRD pump suction filter and restarted CRD pump(s), the pumps may be re-tripped at the discretion of the lead examiner.
3. Once the crew successfully injects with SLC, the lead examiner should direct tripping the running SLC pump to prevent lowering power with boron.
4. It is recommended to delay pulling RPS fuses and venting the scram air header for a short amount of time only if necessary to see the crew lower Reactor water level.
5. The final Reactor water level control band is likely to be +20" to +45".
6. Recommended termination criteria: (1) All control rods inserted, and (2) Reactor water level controlled in assigned band above -161".

SCENARIO EVENT FORM

EVENTS	7, 8, & 9
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Electrical ATWS, CRD Pumps Trip on Low Suction Pressure, SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips

POSITION	TIME	STUDENT ACTIVITIES
SRO (cont)		Acknowledges failure of CRD pumps. • Directs bypassing CRD suction filter. • Directs re-starting CRD pump(s). Acknowledges failure of SLC to inject. Directs boron injection using RCIC per ES-150-002. Acknowledges all control rods are inserted. Directs stopping boron injection. Exits EO-000-103 and enters EO-000-102, RPV Control. Directs Reactor water level restored and maintained +13" to +54". May direct reset of Main Generator lockouts. Directs initiation of Suppression Chamber spray.

ATC		Inserts SRMs/IRMs.
		
		Runs Recirc to minimum From any RRP HMI screen by:
		• Selects MANUAL FLOW REDUCTION INITIATION.
		• Selects RRP SPEED TO MINIMUM.
		• Selects INITIATE RRP FLOW REDUCTION.
		
		Trips Recirculation pumps A and B one at a time.
		
		Throttles and prevents RPV injection from FW and Cond until level is between -60" and -110" per OP-145-001 hard card:
		• IF RFP A(B)(C) is in DPM, or transfer to DPM is in progress:
		    o Control level in MANUAL via LV-10641 FW Startup Control Vlv controller LIC-C32-1R602.
		    o As required, Adjust INC/DEC button on feeding RFP A(B)(C) SPD CTL/DEMAND SIGNAL controller SIC C32 1R601A(B)(C) in MANUAL to establish and maintain assigned level band. (2.19.9b)
		• Stop Condensate pumps as necessary to leave 2 pumps in operation.

SCENARIO EVENT FORM

EVENTS	7, 8, & 9
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Electrical ATWS, CRD Pumps Trip on Low Suction Pressure, SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips

POSITION	TIME	STUDENT ACTIVITIES

ATC (cont)		**Maintains Reactor water level between -60" and -161" using Table 15 systems (SLC, FW, Cond, CRD, RCIC, HPCI, LPCI).**
		
		May insert control rods using RMCS per EO-000-113 Sheet 2 hard card:
		• Bypass RWM.
		• Establish approximately (if obtainable) (closing Charging Water Iso 146F034 as necessary):
		    o 63 gpm cooling water flow.
		    o 350 psid drive water pressure.
		• Select rod.
		• Depress continuous insert pushbutton.
		
		Dispatch NPO to pull RPS fuses.
		
		Dispatch NPO to vent scram air header.
		
		Once all control rods are inserted, slowly raises injection to restore and maintain Reactor water level -60" to -161" using Table 15 systems (SLC, FW, Cond, CRD, HPCI, LPCI).
		
		Recognizes / reports all control rods inserted.
		
		May reset Main Generator lockouts.
		
		May recognize / report loss of Condensate pumps due to Main Generator lockout with Drywell pressure > 1.72 psig.
		
		Restores and maintains Reactor water level +13" to +54" using Condensate (if available), HPCI and/or RCIC.

BOP		Injects SLC per OP-153-001: • Place HS-14804 SBLC MANUAL INITIATION keylock control switch to A(B) START. • Observe SBLC PUMPS 1P208A(B) STARTS Recognizes / reports SLC not injecting. • May attempt to start/re-start SLC pump. • Recognizes / reports trip of SLC pump(s). Dispatches operator to inject boron using RCIC. Inhibits ADS by placing ADS A and ADS B LOGIC CONTROL switches in INHIBIT.

SCENARIO EVENT FORM

EVENTS	7, 8, & 9
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Electrical ATWS, CRD Pumps Trip on Low Suction Pressure, SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips

POSITION	TIME	STUDENT ACTIVITIES

BOP (cont)		Maximizes CRD per OP-155-001:
		• Place control switch CRD Pump 1P132B(A) to RUN, to start 1P132B(A), Ctl Rod Drive Water Pump B(A).
		• Using FC-C12-1R600, CRD Flow Controller, in MANUAL, fully Opens FV-146-F002A(B), CRD Flo Ctl.
		• Fully Open THTLG PV-146-F003, DRIVE WTR PRESS THTLG valve.
		
		Recognize / report CRD pump trip on low suction pressure.
		• May enter ON-155-007, Loss of CRD System Flow.
		  o Dispatches NPO to open CRD suction filter bypass valve, 146F116.
		  o Closes CRD Flow Control Valve.
		  o Starts CRD pump(s).
		  o Opens CRD Flow Control Valve.
		
		Later, recognizes / reports subsequent CRD pump trip on low suction pressure.
		
		Overrides RCIC per OP-150-001:
		• To prevent Auto Injection if RCIC NOT initiated, Close RCIC TURBINE TRIP AND THROTTLING HV-15012.
		
		Overrides HPCI per OP-152-001:
		• To prevent auto injection if HPCI not initiated, Place HPCI TURBINE FLOW CONTROL FC-E41-1R600 in MANUAL AND Reduce demand to zero (0).
		
		Bypasses MSIV and CIG interlocks per OP-184-001:
		• Bypass MSIV Low Water Level 1 Isolation at 1C645 by Placing the following to BYPASS:
		  o HS-B21-S38A Rx Wtr Lvl 1 MSIV Bypass Logic A.
		  o HS-B21-S38C Rx Wtr Lvl 1 MSIV Bypass Logic C.
		• Bypass CIG Low Water Level 1 and High Drywell Pressure Isolation by Placing the following to BYPASS:
		  o At 1C645, HS-12694 Low Lvl 1/Hi Drywell Press CIG Bypass (HV-12603)
		  o At 1C645, HS-12695 Low Lvl 1/Hi Drywell Press CIG Bypass (SV-12651)
		  o At 1C644, HS-12696 Low Lvl 1/Hi Drywell Press CIG Bypass (SV-12605)
		• IF 1.72# High Drywell Pressure isolation has occurred, Restore CIG as follows:
		  o Open Instr Gas Cmp Suct Iso HV-12603.
		  o Open Instr Gas To Contn Iso SV-12651.
		  o Open Instr Gas Cmp OB Suct ISO SV-12605.

SCENARIO EVENT FORM

EVENTS	7, 8, & 9
OP EVENT / TASK	N/A
BRIEF DESCRIPTION	Electrical ATWS, CRD Pumps Trip on Low Suction Pressure, SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips

POSITION	TIME	STUDENT ACTIVITIES

BOP (cont)		May initiate Suppression Chamber spray per OP-149-004:
		• IF available, Place Emergency Service Water System in operation supplying RHR Room Cooler and RHR Pump to be placed in service.
		• IF LOCA signal present, Place HS-E11-1S17A(B) LOCA ISOLATION MANUAL OVERRIDE Switch to OVERRIDE.
		• Observe White Indicating Light ILLUMINATED above HS-E11-1S17A(B) LOCA ISOLATION MANUAL OVERRIDE.
		• Observe LOCA ISO SWITCH LOOP (A)B MANUAL OVERRIDE (AR-109(113)-C5) Annunciator alarms.
		• Open HV-151-F028A(B) SUPP CHMBR SPR TEST SHUTOFF.
		• Close HV-151-F017A(B)RHR INJ FLOW CTL.
		• IF a RHR Pump not in service, Start 1P202A(B)(C)(D)RHR PUMP.
		• Throttle Open HV-151-F027A(B) SUPP POOL SPRAY CTL, as necessary, to maintain ≤ 500 GPM as indicated on FI-15120A(B) CONTN SPRAY DIV 1(2) AND maintain total loop flowrate ≤ 10,000 gpm.
		• Monitor Suppression Chamber pressure.
		• IF Suppression Chamber pressure drops to 0 psig, THEN Stop Suppression Chamber Sprays.
		• IF required, Place RHRSW in service to RHR HX per section 4.0:
		  o Place RHR Service Water in service to the RHR Heat Exchanger per OP-116-001 OR as follows:
		    ▪ Ensure Closed Unit 2 HV-21210A(B) RHRSW Hx A(B) INLET.
		    ▪ Open HV-11210A(B) Unit 1 RHRSW Hx A(B) INLET to 10% Open.
		    ▪ OPEN HV-11215A(B) Unit 1 RHRSW Hx A(B) OUTLET.
		    ▪ IF required, Place HS-11202A3(B3) RHRSW PUMP A(B) LOCA TRIP switch to RESET.
		    ▪ Start 1P506A(B) RHRSW Pump A(B).
		    ▪ Throttle HV-11210A(B) Unit 1 RHRSW Hx A(B) INLET to establish 8000 to 9000 gpm on FI-E11-1R602A(B) RHRSW HX A(B) INLET FLOW.
		  o Place HV-151-F048A(B) HX A(B) SHELL SIDE BYPS Control Switch to OFF/LOCA RESET position.
		  o Observe White Indicating Light ILLUMINATED above HV-151-F048A(B) Control Switch.
		  o Close HV-151-F048A(B) HX A(B) SHELL SIDE BYPS.