

Facility: PVNGS		Date of Examination: <u>April 2015</u>
Examination Level: RO X SRO		Operating Test Number: 2015 NRC
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R M	A1 – Determine Ability to Stand Shift (2.1.4 3.3/3.8)
Conduct of Operations	R M	A2 – Shutdown Margin Calculation (2.1.37 4.3/4.6; 2.1.20 4.6/4.6)
Equipment Control	R M	A3 – Technical Review of a Tag Assignment Sheet (2.2.13 4.1/4.3)
Radiation Control	R M	A4 – Perform RO Radiological Tasks (2.3.13 3.4/3.8)
Emergency Procedures/Plan	N/A	N/A - This Topic not selected for ROs
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

2015 NRC Exam RO Admin JPM Summary

A1, Determine ability to stand shift with training and license proficiency: This JPM requires the RO to determine if he/she meets the requirements for watchstanding proficiency, including participation in LOCT, in accordance with 40DP-9OP02, Conduct of Shift Operations. The JPM is modified from the original JPM (2012 NRC A-1) in that previous watchstanding dates and hours are changed and participation in training has also changed. In 2012, the reason for not being able to stand a watch was not meeting proficiency requirements. In 2015, the reason is not being current in training.

A2, Shutdown Margin Calculation: This JPM requires the RO to calculate a Shutdown Margin (SDM) in accordance with 72ST-9RX14, Shutdown Margin, Modes 3, 4 and 5; and the Unit 1 Core Data Book. This JPM is modified from the original JPM (from 2010 NRC Exam) in that parameters, such as current boron concentration and time in core life, have changed. Additionally, a planned cooldown to 500°F was added to the Initial Conditions, which now requires the applicant to determine, rather than be given, the Most Conservative Tcold. The number of stuck rods was increased from 1 to 2, which impacts the Acceptance Criteria for the Xenon Adjusted Required Boron Concentration from “met” to “not met.”

A3, Technical Review of a Tag Assignment Sheet: This JPM requires the RO to perform a technical review of a Tag Assignment Sheet and identify errors. This JPM is modified from the original JPM (2009 NRC Exam) in that the induced errors, such as positions of valves and required tags, have been changed.

A4, Perform RO Radiological Tasks: This JPM requires the RO to review given conditions and determine dose received for a task, required authorization for that dose, and posting requirements for the area where the task will be performed; in accordance with 75DP-9RP01, Radiation Exposure and Access Control, and 75DP-0RP01, Radiological Posting and Labeling. This JPM is modified from the original JPM (2013 NRC Exam) in that the exposures, the required approval, and the posting are all different.

Emergency Procedures/Plan Topic not selected for ROs

Facility: PVNGS Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Date of Examination: <u>April 2015</u> Operating Test Number: 2015 NRC
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R D P	A5 – Ensure Compliance with Fatigue Rule Program (2.1.5 2.9/3.9)
Conduct of Operations	R M	A6 – Review Shutdown Margin Calculation (2.1.37 4.3/4.6) (2.1.20 4.6/4.6)
Equipment Control	R M	A7 – Review Surveillance Test (2.2.12 3.7/4.1)
Radiation Control	R M	A8 – Perform SRO Radiological Tasks (2.3.13 3.4/3.8)
Emergency Procedures/Plan	R D	A9 – Classify Event and Make PARs (2.4.41 2.9/4.6) (2.4.44 2.4/4.4)
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: <div style="margin-left: 20px;"> (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1; randomly selected) </div>		

2015 NRC Exam SRO Admin JPM Summary

A5 – Ensure Compliance with Fatigue Rule Program: This JPM requires the SRO to determine if crew members can assume the shift while meeting the fatigue requirements outlined in 01DP-0AP17, Managing Personal Fatigue. The JPM was randomly selected from the previous two NRC exams (2013) at PVNGS.

A6 – Review Shutdown Margin Calculation: This JPM requires the SRO to review a Shutdown Margin (SDM) calculation for accuracy in accordance with 72ST-9RX14, Shutdown Margin, Modes 3, 4 and 5; and the Unit 2 Core Data Book. This JPM is modified from the original JPM (2010 NRC A-5) in that induced errors have changed.

A7 – Review Surveillance Test: This JPM requires the SRO to perform a technical review of a surveillance, Inoperable Power Sources Action Statement, and identify errors. This JPM is modified from the original JPM (2008 NRC SA3) in that the induced errors, such as transmission lines capable of power transmission, acceptance criteria, and operable redundant equipment, have been changed.

A8 – Perform SRO Radiological Tasks: This JPM requires the SRO to review given conditions and determine dose received for a task, required authorization for that dose, and determine who makes the entry; in accordance with 75DP-9RP01, Radiation Exposure and Access Control, and 75DP-0RP01, Radiological Posting and Labeling. This JPM is modified from the original JPM (2012 NRC A8) in that all of the dose values have changed and the individual to perform the task is different.

A9 – Classify Event and Make PARs: This JPM requires the SRO to review given conditions and determine the Emergency Action Level in accordance with EP-0900, Appendix L, and EP-0901, Classifications. It also requires the SRO to make Protective Action Recommendations in accordance with EP-0905, Protective Actions. This is modified Bank JPM EP008-CR-009. The modifications include requiring the use of Met Tower Data, requiring identification of Potentially Affected Sectors, and adding the Emergency Exposure Limit for Life-Saving.



RO ADMIN JPM A1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

JPM BASIS INFORMATION

TASK:	1290020301 Conduct of Shift Operations						
TASK STANDARD:	At the completion of this JPM the applicant will have determined that he IS current in training, he CAN assume RO duties on March 26, and he CANNOT assume RO duties on April 5 due to not being current (at that time) in training.						
K/A:	2.1.4	K/A RATING:	RO:	3.3	SRO:	3.8	
10 CFR 55:	45(b)(12)						
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	15 minutes				
REFERENCES:	40DP-9OP02, Conduct of Shift Operations, Rev 66						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X	

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **No**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Larry Burton Date: 10/14/2011

Revised By: Rusty Quick Date: 03/26/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



**RO ADMIN JPM A1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

1. SIMULATOR SETUP:

- N/A

2. SPECIAL TOOLS/EQUIPMENT:

- Copy of 40OP-9OP02 available

3. JPM PERFORMANCE:

- N/A



**RO ADMIN JPM A1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY**, **DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DO NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



**RO ADMIN JPM A1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- You are currently licensed at PVNGS.
- You have been assigned to work control for last 4 months.
- Today is March 26th.
- You attended LOCT training February 10th -13th but did not take the written exam.
- The LOCT cycle completed Friday, February 20st.
- Attached (next page) is a breakdown of shifts you covered in this quarter.
- You met all license maintenance requirements for the 4th quarter of the previous year.
- You have been asked to take the dayshift for 12 hours on March 26th and April 5th.

INITIATING CUE:

- You are to determine if you:
 1. are current in Training (as of today)
 2. meet requirements to assume RO duties on March 26th
 3. meet requirements to assume RO duties on April 5th (assuming you worked on March 26th and nothing else changes from the Initial Conditions)

Provide your answers on the attached sheet.



**RO ADMIN JPM A1
PVNGS JOB PERFORMANCE MEASURE
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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



**RO ADMIN JPM A1
PVNGS JOB PERFORMANCE MEASURE
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JPM START TIME:

	STEP	CUE	STANDARD
1. *	<p>4.2.1.1 of 40DP-9OP02</p> <p>An Operator's training is current when all required material in an LOCT Training Cycle is completed. If any LOCT material is missed during a training cycle, make-up training shall be completed no later than 6 weeks from the end of the training cycle that the training was part of.</p>		<p>Examinee determines that for the March 26th date, the training would be current.</p> <p>The training would not be current for the April 5th date because it was past the 6 week period.</p>
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
2. *	<p>4.2.2 of 40DP-9OP02</p> <p>ACTIVE NRC Operators License exists when an operator has a valid license and has “actively performed” the functions of an operator or senior operator on a minimum of five 12-hour shifts per calendar quarter.</p>		<p>Examinee determines that he would have enough time to work both days if he worked the March 26th date which would give him 5 12 hours days for the 1st quarter.</p>
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
3. *	<p>4.2.1.1 of 40DP-9OP02</p> <p>An Operator's training is current when all required material in an LOCT Training Cycle is completed. If any LOCT material is missed during a training cycle, make-up training shall be completed no later than 6 weeks from the end of the training cycle that the training was part of.</p>		<p>Applicant answers "NO" to Item 3. The training would not be current for the April 5th date because it was past the 6 week period.</p>
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



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ANSWER KEY

January 15th	12 hour day shift
January 16th	6 hour shift 1030 to 1630
February 24th	12 hour day shift
February 25th	12 hour day shift
March 11th	6.5 hours 1200 to 1830
March 21st	12 hour day shift

1. Are you current in Training? **YES** / NO

If **NO** what must be done to become current?

2. Can you assume RO duties on March 26th? **YES** / NO

If **NO** why not?

3. Can you assume RO duties on April 5th (assuming you worked 12 hours on March 26th)?
YES / **NO**

If **NO** why not?

Training would expire before this date due to 6 weeks past the
requel cycle

ANSWER KEY



**RO ADMIN JPM A1
PVNGS JOB PERFORMANCE MEASURE
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APPLICANT

INITIAL CONDITIONS:

- You are currently licensed at PVNGS.
- You have been assigned to work control for last 4 months.
- Today is March 26th.
- You attended LOCT training February 10th -13th but did not take the written exam.
- The LOCT cycle completed Friday, February 20st.
- Attached (next page) is a breakdown of shifts you covered in this quarter.
- You met all license maintenance requirements for the 4th quarter of the previous year.
- You have been asked to take the dayshift on March 26th and April 5th.

INITIATING CUE:

- You are to determine if you:
 1. are current in Training (as of today)
 2. meet requirements to assume RO duties on March 26th
 3. meet requirements to assume RO duties on April 5th (assuming you worked on March 26th and nothing else changes from the Initial Conditions)

Provide your answers on the attached sheet.

APPLICANT



**RO ADMIN JPM A1
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APPLICANT

January 15th	12 hour day shift
January 16th	6 hour shift 1030 to 1630
February 24th	12 hour day shift
February 25th	12 hour day shift
March 11th	6.5 hours 1200 to 1830
March 21st	12 hour day shift

1. Are you current in Training? **YES / NO**

If **NO**, what must be done to become current?

2. Can you assume RO duties on March 26th? **YES / NO**

If **NO**, why not?

3. Can you assume RO duties on April 5th (assuming you worked 12 hours on March 26th and nothing else changes from the Initial Conditions)?
YES / NO

If **NO**, why not?

APPLICANT

APPLICANT HANDOUT - 2015 PVNGS NRC EXAM JPM A1

January 2015						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

February 2015						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	29

March 2015						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

April 2015						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		



RO ADMIN JPM A2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

JPM BASIS INFORMATION

TASK:	1230050101 Perform a shutdown margin calculation						
TASK STANDARD:	Required boron concentration post trip determined and Shutdown margin acceptance criteria are determined for two CEAs not fully inserted into the core.						
K/A:	2.1.37		K/A RATING:	RO:	4.3	SRO:	4.6
10 CFR 55:	45(b)(5)						
APPLICABLE POSITION(S):	RO		VALIDATION TIME:	40 minutes			
REFERENCES:	72ST-9RX14, Shutdown Margin – Modes 3, 4, and 5, Revision 17, Core Data Book Unit 1 Cycle 19						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR			PLANT		OTHER	X

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **No**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Alan Malley Date: 10/08/2004

Revised By: Rusty Quick Date: 03/26/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



**RO ADMIN JPM A2
PVNGS JOB PERFORMANCE MEASURE
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1. SIMULATOR SETUP:

A. N/A

2. SPECIAL TOOLS/EQUIPMENT:

- Copy of 73ST-9RX14, Shutdown Margin - Modes 3, 4, and 5, Rev 17
- U1 Cycle 19 Core Data Book Revision 0

3. JPM PERFORMANCE:

- N/A



**RO ADMIN JPM A2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY**, **DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DO NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



**RO ADMIN JPM A2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- You are a Reactor Operator in Unit 1
- Unit 1 was manually tripped at 0100 today due to an RCP problem.
- ALL Reactor Trip breakers opened on the trip.
- Full Strength CEAs #12 and #13 did not insert on the trip.
- The crew is borating at 40 gpm.
- The plant has been stabilized at 565°F Tcold. (MODE 3)
- All RCPs are operating.
- The CRS has directed a cooldown to 500°F Tcold for this shift.
- Current boron concentration is 100 ppm from the latest chemistry sample taken 30 minutes ago (assume from present time).
- The Unit is at 500 EFPD.
- The crew is preparing to perform 72ST-9RX14, Shutdown Margin – Modes 3, 4, and 5.
 - This is not the first verification per 72ST-9RX14 after the trip.
 - This ST is to be completed for the next 12 hours.
 - Reactor Engineering has determined that the minimum (least negative) expected Xenon is from the XeRho V2 Code and is -2471 pcm.
 - A pre-job brief has been performed.
- We will NOT be entering Refueling Operations during this shift.

INITIATING CUE:

- The CRS has directed you to perform Shutdown Margin Calculation per 72ST-9RX14.
- Another operator will complete either Section 7.0 (Restoration) **OR** Section 8.0 (Contingencies) as applicable when you get to a step that directs that action.



**RO ADMIN JPM A2
PVNGS JOB PERFORMANCE MEASURE
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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step Number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



**RO ADMIN JPM A2
PVNGS JOB PERFORMANCE MEASURE
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JPM START TIME:

	STEP	CUE	STANDARD
1.	Step 6.2.1: IF this is the initial SDM verification following a reactor trip and any FSCEA is NOT Fully Inserted, THEN GO TO Section 8.0, Contingencies.		Examinee N/As this step since the Initial Conditions stated this was not the first performance after the trip.
SAT / UNSAT Comments (required for UNSAT):			

Note before Step 6.2.2

Line numbers (in parentheses) within action steps are in reference to individual line items in Appendix D.



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	STEP	CUE	STANDARD
2. *	<p>Step 6.2.2 and Step 6.2.2.1:</p> <p>Select the most conservative T_{Cold} for the surveillance period as follows:</p> <p>IF Reactor Coolant Pumps (RCP's) are in service or RCS natural circulation conditions exist, THEN select the most conservative T_{Cold} from ONE of the following:</p> <ul style="list-style-type: none"> • RCT115, RC COLD LEG 1B TEMP points from PMS or ERFDADS • RCT125, RC COLD LEG 2A TEMP points from PMS or ERFDADS • As directed by the SM/CRS. 		Examinee determines the most conservative T_{Cold} is the target temperature for the planned cooldown and enters "500°F."
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
3.	<p>Step 6.2.2.2 :</p> <p>IF RCP's are secured and Shutdown Cooling is in service,</p> <p>THEN select the most conservative T_{Cold} from ONE of the following:.....</p>		Examinee marks this step as "N/A" and proceeds with the procedure.
SAT / UNSAT Comments (required for UNSAT):			



**RO ADMIN JPM A2
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	STEP	CUE	STANDARD
4. *	Step 6.2.3: Record ALL of the following initial calculation data: Most Conservative T _{Cold} for Surveillance Period (Line D.1).		On Appendix D – Any FSCEA Not Fully Inserted with RTCBs Open - Data Collection, Examinee enters the following in the Value column: “ 500°F ” for the “Most Conservative T _{Cold} ” on Line D.1.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
5. *	Step 6.2.3 (cont): RCS Boron concentration from latest chemistry sample (Line D.2)		“ 100 ” ppm for “RCS Boron concentration from latest chemistry sample” on Line D.2.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
6.	Step 6.2.3 (cont): Date and Time of RCS Boron Sample (Line D.3).		Enters “(today’s date) and time one half hour ago ” for “Date and Time of RCS Boron Sample” on Line D.3. EXAMINER NOTE: The Date/Time of the latest Chemistry sample is NOT critical because this calculation is unaffected by the time of the sample.
SAT / UNSAT Comments (required for UNSAT):			



**RO ADMIN JPM A2
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	STEP	CUE	STANDARD
7. *	Step 6.2.3 (cont): Current Core Burnup (Line D.4).		Examinee enters “ 500 ” for the “Current Core Burnup” on Line D.4.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
8. *	Step 6.2.4 and Step 6.2.4.1: Determine Untrippable CEA Required RCS Boron Concentration as follows: Determine the Xenon Free Required RCS Boron Concentration from Core Data Book(CDB) Curves 3.1.X, using ALL the following data: <ul style="list-style-type: none"> • Most conservative TCold (Line D.1). • Current core burnup (Line D.4). 		Examinee determines that Curve 3.1.21 should be used since given time in core life is 500 EFPD. From Curve 3.1.21, examinee reads the graph and determines that the Minimum RCS Boron Concentration vs T-COLD is between “ 362 and 368 ” ppm. EXAMINER NOTE: “Exact” value for Minimum RCS Boron Concentration vs T-COLD is 365 ppm. The smallest increment on this graph is 5 ppm. Applying an industry standard tolerance of +/- ½ the smallest increment would yield a tolerance of +/- 2.5 ppm, for an overall range for this step of 362.5 to 367.5 ppm. To allow for rounding, 362.5 was rounded to 362 and 367.5 was rounded to 368.
SAT / UNSAT Comments (required for UNSAT):			



**RO ADMIN JPM A2
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	STEP	CUE	STANDARD
9. *	Step 6.2.4.2: Record the Xenon Free Required RCS Boron Concentration (Line D.5).		Examinee records between “ 362 and 368 ” ppm for the Minimum RCS Boron Concentration vs T-COLD in Line D.5.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
10. *	Step 6.2.4.3: Determine the Worst Stuck CEA Pair Worth from the CDB Curve 2.16.X using ALL of the following: <ul style="list-style-type: none"> • Most conservative T_{Cold} (Line D.1) • CS Boron Concentration (Line D.2) • Current Core Burnup (Line D.4) 		Examinee determines that Curve 2.16.3 should be used since given time in core life is 500 EFPD. From Curve 2.16.3 or Table 2.16.3, examinee determines that the Worst Stuck CEA Pair Worth is between -6200 and -6233 pcm. EXAMINER NOTE: “Interpolated” value (from Table 2.16.3) for Worst Stuck CEA Pair Worth is -6212.5 pcm. From Curve 2.16.3, the “approximate” value is -6220. The smallest increment on the curve is 25 pcm. Applying an industry standard tolerance of $\pm \frac{1}{2}$ the smallest increment would yield a tolerance of ± 12.5 pcm from the lowest and highest number above, (6212.5 - 12.5= 6200) and (6220 + 12.5= 6232.5) for an overall range for this step of 6200 to 6232.5 pcm. To allow for rounding 6232.5 was rounded to 6233.
SAT / UNSAT Comments (required for UNSAT):			



**RO ADMIN JPM A2
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	STEP	CUE	STANDARD
11. *	Step 6.2.4.4: Record the Worst Stuck CEA Pair Worth (Line D.6).		Examinee records between “ -6200 and -6233 ” pcm for Worst Stuck CEA Pair Worth in Line D.6.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
12. *	Step 6.2.4.5: Determine the Worst Stuck CEA Worth from the CDB Curve 2.15.X using ALL of the following: <ul style="list-style-type: none"> • Most conservative TCold (Line D.1) • RCS Boron Concentration (Line D.2) • Current Core Burnup (Line D.4) 		Examinee determines that Curve 2.15.3 should be used since given time in core life is 500 EFPD. From Curve 2.15.3 or Table 2.15.3, examinee reads the graph or table and determines that the Worst Stuck CEA Worth is between -3780 and -3800 pcm. EXAMINER NOTE: “Interpolated” value (from Table 2.15.3) for Worst Stuck CEA Worth is -3779.4 pcm. From Curve 2.15.3, the “exact” value is -3790. The smallest increment on the curve is 20 pcm. Applying an industry standard tolerance of +/- ½ the smallest increment would yield a tolerance of +/- 10 ppm, for an overall range for this step of -3780 to -3800 pcm.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
13. *	Step 6.2.4.6: Record Worst Stuck CEA Worth (Line D.7).		Examinee records between “ -3780 to -3800 ” pcm for Worst Stuck CEA Pair Worth in Line D.7.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
14. *	Step 6.2.4.7: Subtract the Worst Stuck CEA Worth (Line D.7) from the Worst Stuck CEA Pair Worth (Line D.6) to determine the Worth Penalty for One Untrippable CEA (Line D.8).		Examinee subtracts the Worst Stuck CEA Worth from the Worst Stuck CEA Pair Worth and enter a value of “ -2400 to -2455 ” pcm. Examiner Note: These values were determined by subtracting the lowest value in Step 13 (-3780) from the highest value in Step 11 (-6235 pcm) and by subtracting the highest value in Step 13 (-3800) from the lowest value in Step 11 (-6200).
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
15. *	<p>Step 6.2.4.8:</p> <p>Determine the SDM Boron Worth from the CDB Curve 4.3.X using ALL of the following:</p> <ul style="list-style-type: none"> • Most conservative T_{Cold} (Line D.1) • RCS Boron Concentration (Line D.2) • Current Core Burnup (Line D.4) 		<p>Examinee determines that Curve 4.3.3 applies since 500 EFP is closest to the given core life of 501 EFPD.</p> <p>Reading the 600 ppm curves between 490 degrees F and 515 degrees F, Examinee determines the Boron Worth is between “-9.5 to -9.8” pcm/ppm.</p> <p>EXAMINER NOTE:</p> <p>From Table 4.3.3, the “Interpolated” value for SDM Boron Worth is -9.69 pcm/ppm. From Curve 4.3.3, the “interpolated” value is -9.6 pcm/ppm. The smallest increment on the curve is 0.1 pcm/ppm. Applying an industry standard tolerance of +/- ½ the smallest increment would yield a tolerance of +/- 0.05 ppm, for an overall range for this step of -9.55 to -9.74 pcm.</p> <p>Procedure calls for 1/10 increments, so for rounding, the band should be -9.5 to -9.8 pcm</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



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	STEP	CUE	STANDARD
16. *	Step 6.2.4.9: Record the SDM Boron Worth (Line D.9).		Examinee enters Boron Worth of between “-9.5 to -9.8” pcm/ ppm on Line D.9.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
17. *	Step 6.2.4.10: Divide Worth Penalty for one Untrippable CEA (Line D.8) by the SDM Boron Worth (Line D.9) to calculate the Boron Concentration Penalty for one Untrippable CEA (Line D.10).		Examinee divides “-2400 to -2455” pcm (Line D.7) by -9.5 to -9.8” pcm/ppm (Line D.9) for a Boron Concentration Penalty for one Untrippable CEA of “245-259” ppm). EXAMINER NOTE: These values were determined by dividing the lowest value in Step 14 (-2400) by the highest value in Step 15 (-9.8 pcm/ppm) and by dividing the highest value in Step 14 (-2455) by the lowest value in Step 15 (-9.5 pcm/ppm). To allow for rounding errors, 244.9 is rounded to 245 and 258.4 is rounded to 259, for a total range of 245-259 .
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
18. *	Step 6.2.4.11: Record the Boron Concentration Penalty for one Untrippable CEA (Line D.10).		Examinee enters between “ 245 and 259 ” on Line D.10.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
19. *	Step 6.2.4.12: Record the total number of Untrippable CEAs (Line D.11).		Examinee enters “2” on line D.11 because the Initial Conditions stated two CEAs were not inserted.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
20. *	Step 6.2.4.13: Determine the Total Untrippable CEA Boron Concentration Penalty (Line D.12) by multiplying the CEA Boron Concentration Penalty for one Untrippable CEA (Line D.10) by the number of Untrippable CEAs (Line D.11).		Examinee determines Total Untrippable CEA Boron Concentration Penalty by multiplying the value from D.10 between “ 245 and 259 ” by 2 and enters it in on Line D.12
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
21. *	Step 6.2.4.14: Record the Total Untrippable CEA Boron Concentration Penalty (Line D.12).		Examinee enters between “ 490 and 518 ” ppm on Line D.12.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
22. *	Step 6.2.4.15: Add the Xenon Free Required RCS Boron Concentration (Line D.5) to Total Untrippable CEA Boron Concentration Penalty (Line D.12) to determine the Untrippable CEA Xenon Free Required RCS Boron Concentration (Line D.13).		Examinee adds the number from Line D.5 (between “ 362 and 368 ” ppm) to the number from Line D.12 (between “ 490 and 518 ” ppm) and enters it on Line D.13. Adding the two lowest numbers (362 + 490) and the two highest numbers (368 + 518) results in a range between “ 852 and 886 ” ppm
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
23. *	Step 6.2.4.16: Record the Untrippable CEA Required RCS Boron Concentration (Line D.13).		The examinee enters a value between “ 852 and 886 ” ppm on Line D.13.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
24.	Step 6.2.5: Sign for performing the SDM calculation.		Examinee signs for calculations.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
25.	Step 6.2.6: Perform an Independent Verification the SDM calculation is correct.	IF REQUESTED CUE: Another Operator has Independently Verified the calculations.	
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
26. *	Step 6.2.7: Record the COLR Refueling Boron Concentration (Line D.17).		Examinee records 3000 ppm from the Initial Conditions.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
27.	Step 6.2.8: IF the value of the Untrippable CEA Required RCS Boron Concentration (Line D.13) is greater than or equal to the COLR Refueling Boron Concentration (Line D.17), THEN GO TO Section 6.5, RCS Borated to COLR Refueling Boron Concentration.		Examinee "N/As" this step since the Value in Line D.13 is < 3000 ppm.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
28. *	<p>Step 6.2.9 and 6.2.9.1:</p> <p>IF the current RCS Boron Concentration (Line D.2) is greater than or equal to the calculated Untrippable CEA Required RCS Boron Concentration (Line D.13), THEN perform the following:</p> <p>Evaluate the following SDM Technical Specification Acceptance Criteria: Current RCS Boron concentration (Line D2) is greater than or equal to the Untrippable CEA required RCS Boron Concentration (Line D.13)</p> <p>Acceptance Criteria Met? (Circle Result) YES/NO</p>		<p>Examinee determines current RCS Boron Concentration (Line D.2) is less than or equal to the Untrippable CEA Required RCS Boron Concentration (Line D.13) and "N/As" this step and goes to Step 6.2.10.</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



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	STEP	CUE	STANDARD
29.	Step 6.2.10 and 6.2.10.1: Determine the Xenon Adjusted Required Boron Concentration as follows: Determine the minimum (most conservative) expected Xenon reactivity from ONE of the following sources: <ul style="list-style-type: none"> • XeRho V2 Code considering the time period for which the SDM calculation will be valid. • Provided by Reactor Engineering using the SIMULATE-3 Code. • Other Reactor Engineering source as documented in the Surveillance Test Log. 		Examinee determines from Initial Conditions that Reactor Engineering has provided a Xenon reactivity of -2471 pcm.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
30. *	Step 6.2.10.2: Record Xenon reactivity (Line D.14). .		Examinee enters “-2471” on Line D.14.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
31. *	Step 6.2.10.3: Divide Xenon Reactivity (Line D.14) by the Boron Worth (Line D.9) to obtain a Xenon Reactivity Adjustment Term (Line D.15).		Examinee divides -2471 by (-9.5 to -9.8) to obtain a value between 252.1 and 260.1. To allow for rounding errors, 252.1 is rounded to 252 and 260.17 is rounded to 261, for a total range of 252-261.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
32. *	Step 6.2.10.4: Record Xenon Reactivity Adjustment Term (Line D.15).		Examinee enters between 252 and 261 ppm on Line D.15.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
33. *	Step 6.2.10.5: Subtract the Xenon Reactivity Adjustment Term (Line D.15) from the Untrippable CEA Xenon Free Required RCS Boron Concentration (Line D.13) to obtain a Xenon Adjusted Required Boron Concentration (Line D.16).		Examinee enters between 592 and 634 ppm on Line D.16. To obtain a range for this value, the highest value from Line D.15 (261) was subtracted from the lowest value from Line D.13 (852). $[852 - 261 = 591]$. Also, the lowest value from Line D.15 (252) was subtracted from the highest value from Line D.13 (886). $[886 - 252 = 634]$ This results in a total range between 591 and 634 .
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
34. *	Step 6.2.11: Record Xenon Adjusted Required Boron Concentration (Line D.16).		Examinee enters between 591 and 634 ppm on Line D.16.

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
35.	Step 6.2.12: Sign for performing the SDM calculation.		Examinee signs for calculations.

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
36.	Step 6.2.13: Perform an Independent Verification the SDM calculation is correct.	IF REQUESTED CUE: Another Operator has Independently Verified the calculations.	

SAT / UNSAT
Comments (required for UNSAT):



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	STEP	CUE	STANDARD
37. *	Step 6.2.14: Evaluate the following SDM Technical Specification Acceptance Criteria: Current RCS Boron concentration (Line D2) is greater than or equal to the Xenon Adjusted Required Boron Concentration (Line D.16) Acceptance Criteria Met? (Circle Result) YES/NO .		Examinee determines current RCS Boron Concentration (Line D.2) is less than or equal to the Xenon Adjusted Required Boron Concentration (Line D.16) and circles "NO."
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
38. *	Step 6.2.15: IF the SDM Technical Specification Acceptance Criteria is NOT met, THEN GO TO Section 8.0, Contingencies.	INFORM CUE: Per the Initial Conditions - Another operator will complete either Section 7.0 (Restoration) OR Section 8.0 (Contingencies) as applicable when you get to a step that directs that action.	Examinee goes to Section 8.0, Contingencies.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



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INITIAL CONDITIONS:

- You are a Reactor Operator in Unit 1
- Unit 1 was manually tripped at 0100 today due to an RCP problem.
- ALL Reactor Trip breakers opened on the trip.
- Full Strength CEAs #12 and #13 did not insert on the trip.
- The crew is borating at 40 gpm.
- The plant has been stabilized at 565°F Tcold. (MODE 3)
- All RCPs are operating.
- The CRS has directed a cooldown to 500°F Tcold for this shift.
- Current boron concentration is 100 ppm from the latest chemistry sample taken 30 minutes ago (assume from present time).
- The Unit is at 500 EFPD.
- The crew is preparing to perform 72ST-9RX14, Shutdown Margin – Modes 3, 4, and 5.
 - This is not the first verification per 72ST-9RX14 after the trip.
 - This ST is to be completed for the next 12 hours.
 - Reactor Engineering has determined that the minimum (least negative) expected Xenon is from the XeRho V2 Code and is -2471 pcm.
 - A pre-job brief has been performed.
- We will NOT be entering Refueling Operations during this shift.

INITIATING CUE:

- The CRS has directed you to perform Shutdown Margin Calculation per 72ST-9RX14.
- Another operator will complete either Section 7.0 (Restoration) **OR** Section 8.0 (Contingencies) as applicable when you get to a step that directs that action.

APPLICANT

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Appendix D - Any FSCEA Not Fully Inserted with RTCBs Open - Data Collection

Line	Procedure Step	Description	Value
D.1	6.2.3	Most Conservative T _{Cold} for Surveillance Period	<u>500</u> °F
D.2	6.2.3	RCS Boron concentration from latest chemistry sample	<u>100</u> ppm
D.3	6.2.3	Date and Time of RCS Boron Sample	<u>(today)</u>
D.4	6.2.3	Current Core Burnup	<u>500</u> EFPD
D.5	6.2.4.2	Xenon Free Required RCS Boron Concentration	<u>362-368</u> ppm
D.6	6.2.4.4	Worst Stuck CEA Pair Worth	<u>(-) 6200-6233</u> pcm
D.7	6.2.4.6	Worst Stuck CEA Worth	<u>(-) 3780-3800</u> pcm
Worth Penalty for One Untrippable CEA $\begin{array}{ccc} (6233) & (3780) & (2455) \\ 6200-6233 & \text{pcm} - & 3780-3800 & \text{pcm} = & 2400-2455 & \text{pcm} \end{array}$ <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div>Line D.6 (6200)</div> <div>Line D.7 (3800)</div> <div>Line D.8 (2400)</div> </div>			
D.8	Calculation	Worth Penalty for One Untrippable CEA	<u>(-) 2400-2455</u> pcm
D.9	6.2.4.9,	SDM Boron Worth	<u>(-) 9.5-9.8</u> pcm/ppm
Boron Concentration Penalty for One Untrippable CEA $\begin{array}{ccc} (2455) & (9.5) & (259) \\ (-) 2400-2455 & \text{pcm} / (-) & 9.5-9.8 & \text{pcm/ppm} = & 245-259 & \text{ppm} \end{array}$ <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div>Line D.8 (2400)</div> <div>Line D.9 (9.8)</div> <div>Line D.10 (245)</div> </div>			
D.10	Calculated Value	Boron Concentration Penalty for ONE Untrippable CEA	<u>245-259</u> ppm
D.11	6.2.4.12	Total number of Untrippable CEAs	<u>2</u> CEAs
Total Untrippable CEA Boron Concentration Penalty $\begin{array}{ccc} (259) & (2) & (518) \\ 245-259 & \text{ppm} \times & 2 & = & 490-518 & \text{ppm} \end{array}$ <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div>Line D.10 (245)</div> <div>Line D.11 (2)</div> <div>Line D.12 (490)</div> </div>			
D.12	Calculated Value	Total Untrippable CEA Boron Concentration Penalty	<u>490-518</u> ppm

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Line	Procedure Step	Description	Value
Untrippable CEA Required RCS Boron Concentration			
		$\begin{array}{ccc} \text{(368)} & \text{(518)} & \text{(886)} \\ 362-368 & \text{ppm} + & 490-518 & \text{ppm} = & 852-886 & \text{ppm} \end{array}$	
		$\begin{array}{ccc} \text{Line D.5} & \text{Line D.12} & \text{Line D.13} \\ \text{(362)} & \text{(490)} & \text{(852)} \end{array}$	
D.13	Calculated Value	Untrippable CEA Xenon Free Required RCS Boron Concentration	852-886 ppm
D.14	6.2.10.2	Xenon Reactivity (Check One) <input checked="" type="checkbox"/> Xerho V2 Value provided by reactor engineering using SIMULATE-3	-2471 pcm
Calculated Xenon Adjustment Term			
		$\begin{array}{ccc} \text{(2471)} & \text{(9.5)} & \text{(261)} \\ (-) 2471 & \text{pcm} / (-) & 9.5-9.8 & \text{pcm/ppm} = & 252-261 & \text{ppm} \end{array}$	
		$\begin{array}{ccc} \text{Line D.14} & \text{Line D.9} & \text{Line D.15} \\ \text{(2471)} & \text{(9.8)} & \text{(252)} \end{array}$	
D.15	Calculated Value	Xenon Reactivity Adjustment Term	(+) 252-261 ppm
Xenon Adjusted Required Boron Concentration			
		$\begin{array}{ccc} \text{(886)} & \text{(252)} & \text{(634)} \\ 852-886 & \text{ppm} - & 252-261 & \text{ppm} = & 591-634 & \text{ppm} \end{array}$	
		$\begin{array}{ccc} \text{Line D.13} & \text{Line D.15} & \text{Line D.16} \\ \text{(852)} & \text{(261)} & \text{(591)} \end{array}$	
D.16	Calculated Value	Xenon Adjusted Required Boron Concentration	591-634 ppm
D.17	6.2.7	COLR Refueling Boron Concentration	3000 ppm

End of Appendix D

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17**6.2 Any FSCEA Not Fully Inserted - RTCBs Open**

- ~~N/A~~ 6.2.1 IF this is the initial SDM verification following a reactor trip and any FSCEA is NOT Fully Inserted,
THEN GO TO Section 8.0, Contingencies.

NOTE

~~6.2.1~~ Line numbers (in parentheses) within action steps are in reference to individual line items in Appendix D.

- ~~6.2.2~~ 6.2.2 Select the most conservative T_{Cold} for the surveillance period as follows:

- ~~6.2.2.1~~ 6.2.2.1 IF Reactor Coolant Pumps (RCP's) are in service or RCS natural circulation conditions exist,
THEN select the most conservative T_{Cold} from ONE of the following:

- RCT115, RC COLD LEG 1B TEMP points from PMS or ERFDADS
- (500°F) • RCT125, RC COLD LEG 2A TEMP points from PMS or ERFDADS
- • As directed by the SM/CRS

- ~~N/A~~ 6.2.2.2 IF RCP's are secured and Shutdown Cooling is in service,
THEN select the most conservative T_{Cold} from ONE of the following:

- ~~N/A~~ • SIA-TT-351Y, HX TO LOOPS on SIA-TR-351, Shutdown Cooling Train A
- • ERFDADS point SIT351Y, Shutdown Cooling Loop A
- • SIB-TT-352Y, HX TO LOOPS on SIB-TR-352, Shutdown Cooling Train B
- • ERFDADS point SIT352Y, Shutdown Cooling Loop B
- ✓ • As directed by the SM/CRS

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Bo 6.2.3 Record ALL of the following initial calculation data:

- Bo • Most Conservative T_{Cold} for Surveillance Period (Line D.1).
- Bo • RCS Boron concentration from latest chemistry sample (Line D.2).
- Bo • Date and Time of RCS Boron Sample (Line D.3).
- Bo • Current Core Burnup (Line D.4).

Bo 6.2.4 Determine Untrippable CEA Required RCS Boron Concentration as follows:

Bo 6.2.4.1 Determine the Xenon Free Required RCS Boron Concentration from Core Data Book(CDB) Curves 3.1.X, using ALL the following data:

- Bo • Most conservative T_{Cold} (Line D.1).
- Bo • Current core burnup (Line D.4).

Bo 6.2.4.2 Record the Xenon Free Required RCS Boron Concentration (Line D.5).

Bo 6.2.4.3 Determine the Worst Stuck CEA Pair Worth from the CDB Curve 2.16.X using ALL of the following:

- Bo • Most conservative T_{Cold} (Line D.1)
- Bo • RCS Boron Concentration (Line D.2)
- Bo • Current Core Burnup (Line D.4)

Bo 6.2.4.4 Record the Worst Stuck CEA Pair Worth (Line D.6).

Bo 6.2.4.5 Determine the Worst Stuck CEA Worth from the CDB Curve 2.15.X using ALL of the following:

- Bo • Most conservative T_{Cold} (Line D.1)
- Bo • RCS Boron Concentration (Line D.2)
- Bo • Current Core Burnup (Line D.4)

Bo 6.2.4.6 Record Worst Stuck CEA Worth (Line D.7).

Bo 6.2.4.7 Subtract the Worst Stuck CEA Worth (Line D.7) from the Worst Stuck CEA Pair Worth (Line D.6) to determine the Worth Penalty for One Untrippable CEA (Line D.8).

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to 6.2.4.8 Determine the SDM Boron Worth from the CDB Curve 4.3.X using ALL of the following:

- to • Most conservative T_{Cold} (Line D.1)
- to • RCS Boron Concentration (Line D.2)
- to • Current Core Burnup (Line D.4)

to 6.2.4.9 Record the SDM Boron Worth (Line D.9).

to 6.2.4.10 Divide Worth Penalty for one Untrippable CEA (Line D.8) by the SDM Boron Worth (Line D.9) to calculate the Boron Concentration Penalty for one Untrippable CEA (Line D.10).

to 6.2.4.11 Record the Boron Concentration Penalty for one Untrippable CEA (Line D.10).

to 6.2.4.12 Record the total number of Untrippable CEAs (Line D.11).

to 6.2.4.13 Determine the Total Untrippable CEA Boron Concentration Penalty (Line D.12) by multiplying the CEA Boron Concentration Penalty for one Untrippable CEA (Line D.10) by the number of Untrippable CEAs (Line D.11).

to 6.2.4.14 Record the Total Untrippable CEA Boron Concentration Penalty (Line D.12).

to 6.2.4.15 Add the Xenon Free Required RCS Boron Concentration (Line D.5) to Total Untrippable CEA Boron Concentration Penalty (Line D.12) to determine the Untrippable CEA Xenon Free Required RCS Boron Concentration (Line D.13).

to 6.2.4.16 Record the Untrippable CEA Required RCS Boron Concentration (Line D.13).

to 6.2.5 Sign for performing the SDM calculation.

Signature

Performer

Date

(today)

to 6.2.6 Perform an Independent Verification the SDM calculation is correct.

Signature

Independent Verifier

Date

(today)

to 6.2.7 Record the COLR Refueling Boron Concentration (Line D.17).

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~~N/A~~ 6.2.8 IF the value of the Untrippable CEA Required RCS Boron Concentration (Line D.13) is greater than or equal to the COLR Refueling Boron Concentration (Line D.17),
THEN GO TO Section 6.5, RCS Borated to COLR Refueling Boron Concentration.

~~N/A~~ 6.2.9 IF the current RCS Boron Concentration (Line D.2) is greater than or equal to the calculated Untrippable CEA Required RCS Boron Concentration (Line D.13),
THEN perform the following:

~~N/A~~ 6.2.9.1 Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria - SR 3.1.1.1		
(NO credit for Xenon)		
Current RCS Boron concentration (Line D.2) is greater than or equal to the Untrippable CEA Required RCS Boron Concentration (Line D.13).		
Acceptance Criteria Met?	(Circle Result)	YES / NO

~~N/A~~ 6.2.9.2 GO TO Section 7.0, Restoration.

~~P~~ 6.2.10 Determine the Xenon Adjusted Required Boron Concentration as follows:

~~P~~ 6.2.10.1 Determine the minimum (most conservative) expected Xenon reactivity from ONE of the following sources:

~~P~~ • XeRho V2 Code considering the time period for which the SDM calculation will be valid.

~~N/A~~ • Provided by Reactor Engineering using the SIMULATE-3 Code.

~~N/A~~ • Other Reactor Engineering source as documented in the Surveillance Test Log.

~~P~~ 6.2.10.2 Record Xenon reactivity (Line D.14).

~~P~~ 6.2.10.3 Divide Xenon Reactivity (Line D.14) by the Boron Worth (Line D.9) to obtain a Xenon Reactivity Adjustment Term (Line D.15).

~~P~~ 6.2.10.4 Record Xenon Reactivity Adjustment Term (Line D.15).

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To 6.2.10.5 Subtract the Xenon Reactivity Adjustment Term (Line D.15) from the Untrippable CEA Xenon Free Required RCS Boron Concentration (Line D.13) to obtain a Xenon Adjusted Required Boron Concentration (Line D.16).

To 6.2.11 Record Xenon Adjusted Required Boron Concentration (Line D.16).

To 6.2.12 Sign for performing the SDM calculation.

Signature

Performer

Date

(today)

To 6.2.13 Perform an Independent Verification the SDM calculation is correct.

Signature

Independent Verifier

Date

(today)

To 6.2.14 Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria - SR 3.1.1.1**(Credit for Xenon)**

Current RCS Boron concentration (Line D.2) is greater than or equal to the Xenon Adjusted Required Boron Concentration (Line D.16).

Acceptance Criteria Met?

(Circle Result)

YES

NO

To 6.2.15 **IF** the SDM Technical Specification Acceptance Criteria is NOT met, **THEN** GO TO Section 8.0, Contingencies.

End of Section 6.2

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Procedure Preparer: John Gunn

Procedure Owner: Robert P. Neville

Procedure Usage Requirements

Sections

Continuous Use:

Refer To 01DP-0AP09,
Procedure and Work Instruction Use and Adherence.

All

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1.0 PURPOSE AND SCOPE

1.1 Purpose

- 1.1.1 The purpose of this surveillance test is to verify compliance with the SHUTDOWN MARGIN (SDM) requirements specified in PVNGS Technical Specifications (TS) for MODEs 3, 4, or 5.

1.2 Scope

- 1.2.1 This procedure is used to evaluate adherence to BOTH of the following TS Limiting Conditions for Operation (LCO):
- LCO 3.1.1, SDM - Reactor Trip Breakers Open
 - LCO 3.1.2, SDM - Reactor Trip Breakers Closed
- 1.2.2 This Surveillance test satisfies ALL of the following surveillance requirements:
- S.R. 3.1.1.1, Verification that SDM is greater than or equal to the value specified in the Core Operating Limits Report (COLR) - Reactor Trip Breakers Open.
 - S.R. 3.1.2.1, Verification that SDM is greater than or equal to the value specified in the COLR - Reactor Trip Breakers Closed.
 - S.R. 3.1.2.2, Verification that K_{N-1} is less than 0.99 - Reactor Trip Breakers Closed when T_{Cold} is less than or equal to 500 deg °F.
 - S.R. 3.1.2.3, Verification that criticality cannot be achieved with Shutdown Group Control Element Assembly (CEA) movement.
 - Surveillance test frequency is per the Surveillance Frequency Control Program.
- 1.2.3 TRM 3.1.200 is implemented by 40OP-9ZZ02, Initial Reactor Startup Following Refuelings and 40OP-9ZZ03, Reactor Startup.

End of Section 1.0



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2.0 RESPONSIBILITIES

- 2.1 The Reactor Engineering Section Leader is responsible for overall control and implementation of this procedure.
- 2.2 The Shift Manager (SM)/Control Room Supervisor (CRS) is responsible for authorizing performance of this surveillance and for taking required actions if the SDM verification does not meet acceptance criteria.
- 2.3 Senior Reactor Operators (SROs), Reactor Operators (ROs), Shift Technical Advisors (STAs) and Reactor Engineers are responsible for the following:
 - 2.3.1 Performing the Shutdown Margin (SDM) determinations of this procedure, as directed by the SM/CRS.
 - 2.3.2 Comparing the results of SDM determinations to acceptance criteria.
 - 2.3.3 Reporting the results of SDM determinations to the SM/CRS.
 - 2.3.4 Implementing contingency actions, as approved by the SM/CRS, if SDM determination results do not comply with acceptance criteria.

End of Section 2.0

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Precautions

- 3.1.1 A non-conservative SDM calculation could result, if the Selected T_{Cold} Value is NOT from the most conservative temperature instrument.
- 3.1.2 A non-conservative Xenon Reactivity Adjustment Term could result, if the minimum Xenon concentration that will be present during the surveillance test is NOT used.

3.2 Limitations

- 3.2.1 SDM will NOT be met immediately following a reactor trip in which one or more FSCEAs fail to fully insert.
- 3.2.2 All references to CEA position and/or trippability in this surveillance test procedure include FSCEAs only. PSCEA worths are NOT credited for SDM.



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- 3.2.3 The SHUTDOWN MARGIN requirement is met for any mode or plant condition if the current RCS Boron Concentration is greater than or equal to the Boron concentration for LCO 3.9.1 - Refueling Boron Concentration specified in the COLR.
- 3.2.4 As the Xenon concentration decreases, the SHUTDOWN MARGIN will decrease. Therefore, calculation of the Xenon reactivity term must consider the minimum Xenon concentration that will be present during the period that the surveillance is valid. For this reason, if it is necessary to account for Xenon, it may be desirable to perform the surveillance at a more frequent interval.
- 3.2.5 The SDM evaluation may be performed based on current or planned conditions as applicable.
- 3.2.6 Rounding of calculation input variables shall be as follows:
- 3.2.6.1 Boron concentration values (PPM) to whole numbers
 - 3.2.6.2 Reactivity values (PCM) to whole numbers
 - 3.2.6.3 Boron Worth (PCM/PPM) to 1 decimal point

End of Section 3.0**4.0 DEFINITIONS**

- 4.1 **COLR** — Core Operating Limits Report
- 4.2 **CDB** — Core Data Book
- 4.3 **ERFDADS** — Emergency Response Facilities Data Acquisition and Display System
- 4.4 **FSCEA** — Full Strength Control Element Assembly

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4.5 **Fully Inserted CEA** — A CEA that meets one or more of the following criteria:

- 1) Rod Bottom Light is illuminated
- 2) Lower Electrical Limit (LEL) light is illuminated
- 3) Rod Bottom Light and LEL indications are no longer available (possibly due to electrical issues) but the CEA has previously been verified fully inserted and no interim actions have been taken that could have re-positioned the CEA.
- 4) Following installation of the Upper Guide Structure (UGS) in the Reactor Vessel, the CEAs may be verified to be fully inserted by notification from the SRO or LSRO in containment that all CEAs have been verified to be unlatched from the UGS Lift Rig per the requirements of 31MT-9RC33, Reactor Vessel Upper Guide Structure Removal and Installation.

4.6 **Fully Withdrawn Shutdown CEA** — A Shutdown CEA that meets one or more of the following criteria:

- 1) Pulse Counter is greater than or equal to 147.75 inches and at least one Reed Switch Position Transmitter (RSPT) is greater than or equal to 145.25 inches.
- 2) Upper Electrical Limit (UEL) position is indicated

4.7 **Fully Withdrawn Regulating CEA** — A Regulating CEA that meets BOTH of the following criteria:

- 1) Pulse Counter Indication is greater than or equal to 147.75 inches
- 2) At least one Reed Switch Position Transmitter (RSPT) indicates greater than or equal to 145.25 inches

4.8 **Minimum Xenon Reactivity** — Least negative reactivity for the 72ST-9RX14 surveillance period.

4.9 **Most Conservative Temperature** — The T_{cold} value chosen for SHUTDOWN MARGIN determination that yields the highest required Boron Concentration for the duration of 72ST-9RX14.

4.10 **PSCEA** — Part Strength Control Element Assembly

4.11 **RCS** — Reactor Coolant System

4.12 **RO** — Reactor Operator

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4.13 **RTCB** — Reactor Trip Circuit Breaker

4.14 **RTCB Status** — The reactor trip breakers are considered open if the CEA drive system is not capable of withdrawing CEAs.

4.15 **SEATS** — Software Error and Activity Tracking System

4.16 **Selected Tcold Value** — T_{cold} value selected at the SM/CRS discretion.

4.17 **SHUTDOWN MARGIN (SDM)** — The instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming BOTH of the following:

1) All FSCEAs (shutdown and regulating) are Fully Inserted except for the single CEA of highest reactivity worth, which is assumed to be fully withdrawn. With any FSCEAs not capable of being Fully Inserted, the withdrawn reactivity worth of these CEAs must be accounted for in the determination of SDM.

2) There is no change in PSCEA position

4.18 **SM/CRS** — Shift Manager/Control Room Supervisor

4.19 **SRO** — Senior Reactor Operator

4.20 **STA** — Shift Technical Advisor

4.21 **SWMS** — Site Work Management System

End of Section 4.0

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5.0 PREREQUISITES AND INITIAL CONDITIONS

5.1 Prerequisites

___ 5.1.1 Personnel performing this procedure are qualified as ANY of the following:

- ___ • Licensed SROs and ROs
- ___ • STAs
- ___ • Reactor Engineers qualified per RX ENG - UNIT OPERATIONS SUPPORT (ESP05-xx-014)

5.2 Initial Conditions

___ 5.2.1 This procedure has been verified current by checking SWMS-DMX or eProc.

Date _____ Time _____

___ 5.2.2 The Unit and current Mode has been selected in the following table:

Date:				
Unit (Circle):	1	2	3	
Current Mode (Circle):	3	4	5	6

___ 5.2.3 Section 2.0, Responsibilities has been read and understood by all test personnel.

___ 5.2.4 Section 3.0, Precautions and Limitations has been read and understood by all test personnel.

___ 5.2.5 The SM/CRS has reviewed the affected Technical Specification(s) or Technical Requirements Manual.

___ 5.2.6 A pre-job brief has been performed.

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___ 5.2.7 ONE of the following sections has been selected for performance:

- ___ • Section 6.1, All FSCEAs Fully Inserted
- ___ • Section 6.2, Any FSCEA Not Fully Inserted - RTCBs Open
- ___ • Section 6.3, Any FSCEA Not Fully Inserted - RTCBs Closed
- ___ • Section 6.4, Appendix J - RCS Boron Concentrations from 40OP-9ZZ23 "Outage GOP" or 40OP-9ZZ24 "SNOW Outage."
- ___ • Section 6.5, RCS Borated to COLR Refueling Boron Concentration.

___ 5.2.8 Permission to perform this test has been granted by the SM/CRS.

End of Section 5.0

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6.0 INSTRUCTIONS

6.1 All FSCEAs Fully Inserted

___ 6.1.1 Check BOTH of the following Initial Conditions met:

- ___ • All FSCEA's fully inserted
- ___ • CEA movement will NOT be performed during the surveillance interval.

NOTE

___ Line numbers (in parentheses) within action steps are in reference to individual line items in Appendix C.

___ 6.1.2 Select the most conservative T_{Cold} for the surveillance period as follows:

___ 6.1.2.1 **IF** Reactor Coolant Pumps (RCP's) are in service or RCS natural circulation conditions exist,
THEN select the most conservative T_{Cold} from ONE of the following:

- ___ • RCT115, RC COLD LEG 1B TEMP points from PMS or ERFDADS
- ___ • RCT125, RC COLD LEG 2A TEMP points from PMS or ERFDADS
- ___ • As directed by the SM/CRS

___ 6.1.2.2 **IF** RCP's are secured and Shutdown Cooling is in service,
THEN select the most conservative T_{Cold} from ONE of the following:

- ___ • SIA-TT-351Y, HX TO LOOPS on SIA-TR-351, Shutdown Cooling Train A
- ___ • ERFDADS point SIT351Y, Shutdown Cooling Loop A
- ___ • SIB-TT-352Y, HX TO LOOPS on SIB-TR-352, Shutdown Cooling Train B
- ___ • ERFDADS point SIT352Y, Shutdown Cooling Loop B
- ___ • As directed by the SM/CRS

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___ 6.1.3 Record ALL of the following initial calculation data:

- ___ • Most Conservative T_{Cold} for Surveillance Period (Line C.1).
- ___ • RCS Boron concentration from latest chemistry sample (Line C.2)
- ___ • Date and Time of RCS Boron Sample (Line C.3).
- ___ • Current Core Burnup (Line C.4).

___ 6.1.4 **IF** RTCBs are OPEN,
THEN perform the following:

___ 6.1.4.1 Determine the Xenon Free Required RCS Boron Concentration from Core Data Book(CDB) Curves 3.1.X, using ALL of the following data:

- ___ • Most conservative T_{Cold} (Line C.1).
- ___ • Current core burnup (Line C.4).

___ 6.1.4.2 Record the Xenon Free Required RCS Boron Concentration (Line C.5).

___ 6.1.4.3 **IF** the RCS Boron concentration (Line C.2) is greater than or equal to the Required Boron Concentration (Line C.5),
THEN GO TO Step 6.1.17.

___ 6.1.4.4 **IF** the RCS Boron concentration (Line C.2) is less than the Required Boron Concentration (Line C.5),
THEN GO TO Step 6.1.6 to verify SDM with credit for Xenon.

___ 6.1.5 **IF** RTCBs are CLOSED,
THEN perform the following:

___ 6.1.5.1 Determine the Xenon Free Required RCS Boron Concentration from CDB Curves 3.2.X, using ALL of the following data:

- ___ • Most conservative T_{Cold} (Line C.1).
- ___ • Current core burnup (Line C.4).

___ 6.1.5.2 Record the Xenon Free Required RCS Boron Concentration (Line C.6).

___ 6.1.5.3 **IF** the RCS Boron concentration (Line C.2) is greater than or equal to the Xenon Free Required Boron Concentration (Line C.6),
THEN GO TO Step 6.1.18.

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___ 6.1.5.4 **IF** the RCS Boron concentration (Line C.2) is less than the Xenon Free Required Boron Concentration (Line C.6),
THEN GO TO Step 6.1.6 to verify SDM with credit for Xenon.

___ 6.1.6 Determine the minimum (least negative) expected Xenon reactivity from ONE of the following sources:

- ___ • XeRho V2 Code (considering the time period for which the SDM calculation will be valid).
- ___ • Reactor Engineering (using the SIMULATE-3 Code).
- ___ • Other Reactor Engineering source as documented in the Surveillance Test Log.

___ 6.1.7 Record Xenon reactivity (Line C.7).

___ 6.1.8 Determine Boron Worth from CDB Curve 4.3.X using ALL of the following:

- ___ • Most conservative T_{Cold} (Line C.1)
- ___ • RCS Boron Concentration (Line C.2)
- ___ • Current Core Burnup (Line C.4)

___ 6.1.9 Record Boron Worth (Line C.8).

___ 6.1.10 Divide Xenon Reactivity (Line C.7) by the Boron Worth (Line C.8) to obtain a Xenon Reactivity Adjustment Term (Line C.9).

___ 6.1.11 Subtract the Xenon Adjustment Term (Line C.9) from the Required Boron Concentration (Line C.5) (RTCBs Open) **OR** (Line C.6) (RTCBs-Closed) to obtain a Xenon Adjusted Required Boron Concentration (Line C.10).

___ 6.1.12 Record the Xenon Adjusted Required RCS Boron Concentration (Line C.10).

___ 6.1.13 Sign for performing the SDM calculation.

Signature _____ Date _____
Performer

___ 6.1.14 Perform an Independent Verification the SDM calculation is correct

Signature _____ Date _____
Independent Verifier



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- ___ 6.1.15 IF the Current RCS Boron Concentration (Line C.2) is greater than or equal to the Xenon Adjusted Required Boron Concentration (Line C.10),
THEN perform the following:
- ___ 6.1.15.1 IF RTCB's are OPEN,
THEN GO TO Step 6.1.17.
- ___ 6.1.15.2 IF RTCB's are CLOSED,
THEN GO TO Step 6.1.18.
- ___ 6.1.16 IF the Current RCS Boron Concentration (Line C.2) is less than the Xenon Adjusted Required Boron Concentration (Line C.10),
THEN GO TO Section 8.0, Contingencies.
- ___ 6.1.17 IF RTCB's are OPEN,
THEN evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria - SR 3.1.1.1

Current RCS Boron concentration (Line C.2) is greater than or equal to ONE of the following:

- Xenon Free Required RCS Boron Concentration (Line C.5)
- Xenon adjusted Required RCS Boron Concentration (Line C.10)

Acceptance Criteria Met? (Circle Result) YES / NO

- ___ 6.1.18 IF RTCB's are CLOSED,
THEN evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria - SR 3.1.2.1

Current RCS Boron concentration (Line C.2) is greater than or equal to ONE of the following:

- Xenon Free Required RCS Boron Concentration (Line C.6)
- Xenon adjusted Required RCS Boron Concentration (Line C.10)

Acceptance Criteria Met? (Circle Result) YES / NO

End of Section 6.1

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- ___ 6.2.1 **IF** this is the initial SDM verification following a reactor trip and any FSCEA is NOT Fully Inserted,
THEN GO TO Section 8.0, Contingencies.

NOTE

___ Line numbers (in parentheses) within action steps are in reference to individual line items in Appendix D.

- ___ 6.2.2 **Select** the most conservative T_{Cold} for the surveillance period as follows:

- ___ 6.2.2.1 **IF** Reactor Coolant Pumps (RCP's) are in service or RCS natural circulation conditions exist,
THEN select the most conservative T_{Cold} from ONE of the following:

- ___ • RCT115, RC COLD LEG 1B TEMP points from PMS or ERFDADS
- ___ • RCT125, RC COLD LEG 2A TEMP points from PMS or ERFDADS
- ___ • As directed by the SM/CRS

- ___ 6.2.2.2 **IF** RCP's are secured and Shutdown Cooling is in service,
THEN select the most conservative T_{Cold} from ONE of the following:

- ___ • SIA-TT-351Y, HX TO LOOPS on SIA-TR-351, Shutdown Cooling Train A
- ___ • ERFDADS point SIT351Y, Shutdown Cooling Loop A
- ___ • SIB-TT-352Y, HX TO LOOPS on SIB-TR-352, Shutdown Cooling Train B
- ___ • ERFDADS point SIT352Y, Shutdown Cooling Loop B
- ___ • As directed by the SM/CRS

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___ 6.2.3 Record ALL of the following initial calculation data:

- ___ • Most Conservative T_{Cold} for Surveillance Period (Line D.1).
- ___ • RCS Boron concentration from latest chemistry sample (Line D.2).
- ___ • Date and Time of RCS Boron Sample (Line D.3).
- ___ • Current Core Burnup (Line D.4).

___ 6.2.4 Determine Untrippable CEA Required RCS Boron Concentration as follows:

___ 6.2.4.1 Determine the Xenon Free Required RCS Boron Concentration from Core Data Book(CDB) Curves 3.1.X, using ALL the following data:

- ___ • Most conservative T_{Cold} (Line D.1).
- ___ • Current core burnup (Line D.4).

___ 6.2.4.2 Record the Xenon Free Required RCS Boron Concentration (Line D.5).

___ 6.2.4.3 Determine the Worst Stuck CEA Pair Worth from the CDB Curve 2.16.X using ALL of the following:

- ___ • Most conservative T_{Cold} (Line D.1)
- ___ • RCS Boron Concentration (Line D.2)
- ___ • Current Core Burnup (Line D.4)

___ 6.2.4.4 Record the Worst Stuck CEA Pair Worth (Line D.6).

___ 6.2.4.5 Determine the Worst Stuck CEA Worth from the CDB Curve 2.15.X using ALL of the following:

- ___ • Most conservative T_{Cold} (Line D.1)
- ___ • RCS Boron Concentration (Line D.2)
- ___ • Current Core Burnup (Line D.4)

___ 6.2.4.6 Record Worst Stuck CEA Worth (Line D.7).

___ 6.2.4.7 Subtract the Worst Stuck CEA Worth (Line D.7) from the Worst Stuck CEA Pair Worth (Line D.6) to determine the Worth Penalty for One Untrippable CEA (Line D.8).

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___ 6.2.4.8 Determine the SDM Boron Worth from the CDB Curve 4.3.X using ALL of the following:

- ___ • Most conservative T_{Cold} (Line D.1)
- ___ • RCS Boron Concentration (Line D.2)
- ___ • Current Core Burnup (Line D.4)

___ 6.2.4.9 Record the SDM Boron Worth (Line D.9).

___ 6.2.4.10 Divide Worth Penalty for one Untrippable CEA (Line D.8) by the SDM Boron Worth (Line D.9) to calculate the Boron Concentration Penalty for one Untrippable CEA (Line D.10).

___ 6.2.4.11 Record the Boron Concentration Penalty for one Untrippable CEA (Line D.10).

___ 6.2.4.12 Record the total number of Untrippable CEAs (Line D.11).

___ 6.2.4.13 Determine the Total Untrippable CEA Boron Concentration Penalty (Line D.12) by multiplying the CEA Boron Concentration Penalty for one Untrippable CEA (Line D.10) by the number of Untrippable CEAs (Line D.11).

___ 6.2.4.14 Record the Total Untrippable CEA Boron Concentration Penalty (Line D.12).

___ 6.2.4.15 Add the Xenon Free Required RCS Boron Concentration (Line D.5) to Total Untrippable CEA Boron Concentration Penalty (Line D.12) to determine the Untrippable CEA Xenon Free Required RCS Boron Concentration (Line D.13).

___ 6.2.4.16 Record the Untrippable CEA Required RCS Boron Concentration (Line D.13).

___ 6.2.5 Sign for performing the SDM calculation.

Signature _____ Date _____
Performer

___ 6.2.6 Perform an Independent Verification the SDM calculation is correct.

Signature _____ Date _____
Independent Verifier

___ 6.2.7 Record the COLR Refueling Boron Concentration (Line D.17).

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- ___ 6.2.8 **IF** the value of the Untrippable CEA Required RCS Boron Concentration (Line D.13) is greater than or equal to the COLR Refueling Boron Concentration (Line D.17),
THEN GO TO Section 6.5, RCS Borated to COLR Refueling Boron Concentration.
- ___ 6.2.9 **IF** the current RCS Boron Concentration (Line D.2) is greater than or equal to the calculated Untrippable CEA Required RCS Boron Concentration (Line D.13),
THEN perform the following:

- ___ 6.2.9.1 Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria - SR 3.1.1.1		
(NO credit for Xenon)		
Current RCS Boron concentration (Line D.2) is greater than or equal to the Untrippable CEA Required RCS Boron Concentration (Line D.13).		
Acceptance Criteria Met?	(Circle Result)	YES / NO

- ___ 6.2.9.2 GO TO Section 7.0, Restoration.
- ___ 6.2.10 Determine the Xenon Adjusted Required Boron Concentration as follows:
- ___ 6.2.10.1 Determine the minimum (most conservative) expected Xenon reactivity from ONE of the following sources:
- ___ • XeRho V2 Code considering the time period for which the SDM calculation will be valid.
 - ___ • Provided by Reactor Engineering using the SIMULATE-3 Code.
 - ___ • Other Reactor Engineering source as documented in the Surveillance Test Log.
- ___ 6.2.10.2 Record Xenon reactivity (Line D.14).
- ___ 6.2.10.3 Divide Xenon Reactivity (Line D.14) by the Boron Worth (Line D.9) to obtain a Xenon Reactivity Adjustment Term (Line D.15).
- ___ 6.2.10.4 Record Xenon Reactivity Adjustment Term (Line D.15).



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___ 6.2.10.5 Subtract the Xenon Reactivity Adjustment Term (Line D.15) from the Untrippable CEA Xenon Free Required RCS Boron Concentration (Line D.13) to obtain a Xenon Adjusted Required Boron Concentration (Line D.16).

___ 6.2.11 Record Xenon Adjusted Required Boron Concentration (Line D.16).

___ 6.2.12 Sign for performing the SDM calculation.

Signature _____ Date _____
Performer

___ 6.2.13 Perform an Independent Verification the SDM calculation is correct.

Signature _____ Date _____
Independent Verifier

___ 6.2.14 Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria - SR 3.1.1.1**(Credit for Xenon)**

Current RCS Boron concentration (Line D.2) is greater than or equal to the Xenon Adjusted Required Boron Concentration (Line D.16).

Acceptance Criteria Met? (Circle Result) YES / NO

___ 6.2.15 **IF** the SDM Technical Specification Acceptance Criteria is NOT met, **THEN GO TO** Section 8.0, Contingencies.

End of Section 6.2

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17**6.3 Any FSCEA Not Fully Inserted - RTCBs Closed****NOTE**

____ Line numbers (in parentheses) within action steps are in reference to individual line items in Appendix E.

____ 6.3.1 Select the most conservative T_{Cold} for the surveillance period as follows:

____ 6.3.1.1 **IF** Reactor Coolant Pumps (RCP's) are in service or RCS natural circulation conditions exist,
THEN select the most conservative T_{Cold} from ONE of the following:

- ____ • RCT115, RC COLD LEG 1B TEMP points from PMS or ERFDADS
- ____ • RCT125, RC COLD LEG 2A TEMP points from PMS or ERFDADS
- ____ • As directed by the SM/CRS

____ 6.3.1.2 **IF** RCP's are secured and Shutdown Cooling is in service,
THEN select the most conservative T_{Cold} from ONE of the following:

- ____ • SIA-TT-351Y, HX TO LOOPS on SIA-TR-351, Shutdown Cooling Train A
- ____ • ERFDADS point SIT351Y, Shutdown Cooling Loop A
- ____ • SIB-TT-352Y, HX TO LOOPS on SIB-TR-352, Shutdown Cooling Train B
- ____ • ERFDADS point SIT352Y, Shutdown Cooling Loop B
- ____ • As directed by the SM/CRS

____ 6.3.1.3 Record ALL of the following initial calculation data:

- ____ • Most Conservative T_{Cold} for Surveillance Period (Line E.1).
- ____ • RCS Boron concentration from latest chemistry sample (Line E.2).
- ____ • Date and Time of RCS Boron Sample (Line E.3).
- ____ • Current Core Burnup (Line E.4).

____ 6.3.2 **IF** there are NO untrippable CEAs,
THEN GO TO Step 6.3.5.

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___ 6.3.3 **IF** there is ONE Untrippable CEA,
THEN GO TO Step 6.3.11.

___ 6.3.4 **IF** there is More Than ONE Untrippable CEA,
THEN GO TO Step 6.3.17.

___ 6.3.5 Perform the following to evaluate SDM with NO Untrippable CEA

___ 6.3.5.1 Determine the Xenon Free Required RCS Boron Concentration from Core Data Book(CDB) Curves 3.2.X, using ALL the following data:

- ___ • Most conservative T_{cold} (Line E.1)
- ___ • Current Core Burnup (Line E.4)

___ 6.3.5.2 Record the Xenon Free Required RCS Boron Concentration (Line E.5).

___ 6.3.5.3 **IF** the Current RCS Boron Concentration (Line E.2) is greater than or equal to the Xenon Adjusted Required Boron Concentration (Line E.5),
THEN perform the following:

- ___ a. Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria

SR 3.1.2.1 and SR 3.1.2.2: SDM - RTCBs Closed

(NO credit for Xenon AND NO Untrippable CEA)

Current RCS Boron concentration (Line E.2) is greater than or equal to the Xenon Adjusted Required Boron Concentration (Line E.5).

Acceptance Criteria Met?

(Circle Result)

YES / NO

- ___ b. GO TO Step 6.3.22 to check SR 3.1.2.3 requirements are met.

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___ 6.3.6 Calculate a Xenon Adjusted Required Boron Concentration as follows:

___ 6.3.6.1 Determine the minimum (most conservative) expected Xenon reactivity from ONE of the following sources:

- ___ • XeRho V2 Code (considering the time period for which the SDM calculation will be valid).
- ___ • Reactor Engineering (using the SIMULATE-3 Code).
- ___ • Other Reactor Engineering source as documented in the Surveillance Test Log.

___ 6.3.6.2 Record Xenon reactivity (Line E.16).

___ 6.3.6.3 Determine Boron Worth from CDB Curve 4.3.X using ALL of the following:

- ___ • Most conservative Tcold (Line E.1)
- ___ • RCS Boron Concentration (Line E.2)
- ___ • Current Core Burnup (Line E.4)

___ 6.3.6.4 Record Boron Worth (Line E.10).

___ 6.3.6.5 Calculate a Xenon Reactivity Adjustment Term.

- ___ a. Divide Xenon Reactivity (Line E.16) by the Boron Worth of (Line E.10) to obtain a Xenon Reactivity Adjustment Term.
- ___ b. Record Xenon Reactivity Adjustment Term (Line E.17).

___ 6.3.6.6 Subtract Xenon Reactivity Adjustment Term (Line E.17) from the Xenon Free Required RCS Boron Concentration for NO Untrippable CEAs (Line E.5) to obtain a Xenon Adjusted Required Boron Concentration.

___ 6.3.6.7 Record Xenon Adjusted Required Boron Concentration - No Untrippable CEAs (Line E.18).

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___ 6.3.7 Sign for performing the SDM calculation.

Signature _____ Date _____
Performer

___ 6.3.8 Perform an Independent Verification the SDM calculation is correct.

Signature _____ Date _____
Independent Verifier

___ 6.3.9 **IF** (Line E.2) is greater than or equal to (Line E.18),
THEN perform the following:

___ 6.3.9.1 Evaluate the SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria

SR 3.1.2.1 and SR 3.1.2.2: SDM - RTCBs Closed

(Credit for Xenon AND NO Untrippable CEA)

Current RCS Boron concentration (Line E.2) is greater than or equal to the Xenon Adjusted Required Boron Concentration- No Untrippable CEAs (Line E.18).

Acceptance Criteria Met? (Circle Result) YES / NO

___ 6.3.9.2 GO TO Step 6.3.22 to check SR 3.1.2.3 requirements are met.

___ 6.3.10 **IF** Technical Specification Acceptance Criteria is NOT met,
THEN GO TO Section 8.0, Contingencies.

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___ 6.3.11 Perform the following to evaluate SDM with ONE Untrippable CEA:

___ 6.3.11.1 Determine Xenon Free Required RCS Boron Concentration from CDB Curves 3.3.X, from the following data:

- ___ • Most conservative T_{cold} (Line E.1)
- ___ • Current Core Burnup (Line E.4)

___ 6.3.11.2 Record the Xenon Free Required RCS Boron Concentration (Line E.6).

___ 6.3.11.3 **IF** (Line E.2) is greater than or equal to (Line E.6),
THEN perform the following:

- ___ a. Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria

SR 3.1.2.1 and SR 3.1.2.2: SDM - RTCBs Closed

(NO credit for Xenon AND One Untrippable CEA)

Current RCS Boron concentration (Line E.2) is greater than or equal to the Xenon Free Required Boron Concentration (Line E.6).

Acceptance Criteria Met?

(Circle Result)

YES / NO

- ___ b. GO TO Step 6.3.22 to check SR 3.1.2.3 requirements are met.

___ 6.3.12 Calculate a Xenon Adjusted Required Boron Concentration as follows:

___ 6.3.12.1 Determine the minimum (most conservative) expected Xenon reactivity from ONE of the following sources:

- ___ • XeRho V2 Code (considering the time period for which the SDM calculation will be valid).
- ___ • Reactor Engineering (using the SIMULATE-3 Code).
- ___ • Other Reactor Engineering source as documented in the Surveillance Test Log.

___ 6.3.12.2 Record Xenon reactivity (Line E.16).

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___ 6.3.12.3 Determine Boron Worth from CDB Curve 4.3.X using ALL of the following:

- ___ • Most conservative Tcold (Line E.1)
- ___ • RCS Boron Concentration (Line E.2)
- ___ • Current Core Burnup (Line E.4)

___ 6.3.12.4 Record Boron Worth (Line E.10).

___ 6.3.12.5 Calculate Xenon Reactivity Adjustment Term.

- ___ a. Divide Xenon Reactivity (Line E.16) by the Boron Worth of (Line E.10) to obtain a Xenon Reactivity Adjustment Term.
- ___ b. Record Xenon Reactivity Adjustment Term (Line E.17).

___ 6.3.12.6 Subtract the Xenon Reactivity Adjustment Term (Line E.17) from the Required Boron Concentration (Line E.6) to obtain a Xenon Adjusted Required Boron Concentration.

___ 6.3.12.7 Record Xenon Adjusted Required Boron Concentration- One Untrippable CEA (Line E.19).

___ 6.3.13 Sign for performing the SDM calculation.

Signature _____ Date _____
Performer

___ 6.3.14 Perform an Independent Verification the SDM calculation is correct.

Signature _____ Date _____
Independent Verifier

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___ 6.3.15 **IF** Line E.2 is greater than or equal to Line E.19,
THEN perform the following:

___ 6.3.15.1 Evaluate the following SDM Technical Specification Acceptance Criteria:

<p align="center">Technical Specification Acceptance Criteria SR 3.1.2.1 and SR 3.1.2.2; SDM - RTCBs Closed (Credit for Xenon AND ONE Untrippable CEA)</p>		
<p>Current RCS Boron concentration (Line E.2) is greater than or equal to the Xenon Adjusted Required Boron Concentration- One Untrippable CEA (Line E.19)</p>		
Acceptance Criteria Met?	(Circle Result)	YES / NO

___ 6.3.15.2 GO TO Step 6.3.22 to check SR 3.1.2.3 requirements are met.

___ 6.3.16 **IF** Technical Specification Acceptance Criteria is NOT met,
THEN GO TO Section 8.0, Contingencies.

___ 6.3.17 Perform the following to evaluate SDM with More Than One Untrippable CEA:

___ 6.3.17.1 Determine Xenon Free Required RCS Boron Concentration from CDB Curves 3.3.X, using from the following data:

- ___ • Most conservative T_{cold} (Line E.1)
- ___ • Current Core Burnup (Line E.4)

___ 6.3.17.2 Record the Xenon Free Required RCS Boron Concentration (Line E.6).

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___ 6.3.17.3 Determine the Worth Penalty for One Untrippable CEAs as follows:

- ___ a. Determine the Worst Stuck CEA Pair Worth from CDB Curve 2.16.X using ALL of the following:
- ___ • Most conservative Tcold (Line E.1)
 - ___ • RCS Boron Concentration (Line E.2)
 - ___ • Current Core Burnup (Line E.4)
- ___ b. Record the Worst Stuck CEA Pair Worth (Line E.7).
- ___ c. Determine the Worst Stuck CEA Worth from the CDB Curve 2.15.X using ALL of the following:
- ___ • Most conservative Tcold (Line E.1)
 - ___ • RCS Boron Concentration (Line E.2)
 - ___ • Current Core Burnup (Line E.4)
- ___ d. Record Worst Stuck CEA Worth (Line E.8).
- ___ e. Subtract the worst Stuck CEA Worth (Line E.8) from the Worst Stuck CEA Pair Worth (Line E.7) to determine the Worth Penalty for One Untrippable CEA (Line E.9).

___ 6.3.17.4 Determine the Boron Worth from CDB Curve 4.3.X using ALL of the following:

- ___ • Most conservative Tcold (Line E.1)
- ___ • RCS Boron Concentration (Line E.2)
- ___ • Current Core Burnup (Line E.4)

___ 6.3.17.5 Record Boron Worth (Line E.10).

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- ___ 6.3.17.6 Determine the Boron Concentration Penalty for Untrippable CEAs as follows:
- ___ a. Divide the Worth Penalty for One Untrippable CEA (Line E.9) by the Boron Worth (Line E.10).
 - ___ b. Record Boron Concentration Penalty for ONE Untrippable CEA (Line E.11)
 - ___ c. Record the total number of Untrippable CEAs (Line E.12).
 - ___ d. Subtract one from the total number of Untrippable CEAs (Line E.12) to obtain N-1.
 - ___ e. Determine the Total Untrippable CEA Boron Concentration Penalty (Line E.14) by multiplying the Boron Concentration Penalty for ONE Untrippable CEA (Line E.11) by N-1 (Line E.13).
 - ___ f. Record Total Untrippable CEA Boron Concentration Penalty (Line E.14).
- ___ 6.3.17.7 Add the Xenon Free Required RCS Boron Concentration (Line E.6) to Total Untrippable CEA Boron Concentration Penalty (Line E.14) to determine the Untrippable CEA Required RCS Boron Concentration (Line E.15).
- ___ 6.3.17.8 Record the Untrippable CEA Required RCS Boron Concentration (Line E-15).
- ___ 6.3.17.9 Record the COLR Refueling Boron Concentration (Line E.22).
- ___ 6.3.17.10 Sign for performing the SDM calculation.
- Signature _____ Date _____
Performer
- ___ 6.3.17.11 Perform an Independent Verification the SDM calculation is correct.
- Signature _____ Date _____
Independent Verifier
- ___ 6.3.17.12 **IF** (Line E.15) is greater than or equal to the COLR Refueling Boron concentration (Line E.22),
THEN GO TO Section 6.5, RCS Borated to COLR Refueling Boron Concentration.

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___ 6.3.18 **IF** (Line E.2) is greater than or equal to (Line E.15),
THEN perform the following:

___ 6.3.18.1 Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria		
SR 3.1.2.1 and SR 3.1.2.2: SDM - RTCBs Closed		
(No Credit for Xenon AND More Than One Untrippable CEA)		
Current RCS Boron concentration (Line E.2) is greater than or equal to the Untrippable CEA Required RCS Boron Concentration (Line E.15)		
Acceptance Criteria Met?	(Circle Result)	YES / NO

___ 6.3.18.2 GO TO Step 6.3.22 to check SR 3.1.2.3 requirements are met.

___ 6.3.19 Calculate a Xenon Adjusted Required Boron Concentration as follows:

___ 6.3.19.1 Determine the minimum (most conservative) expected Xenon reactivity from ONE of the following sources:

- ___ • XeRho V2 Code (considering the time period for which the SDM calculation will be valid).
- ___ • Reactor Engineering (using the SIMULATE-3 Code).
- ___ • Other Reactor Engineering source as documented in the Surveillance Test Log.

___ 6.3.19.2 Record Xenon reactivity (Line E.16).

___ 6.3.19.3 Calculate Xenon Reactivity Adjustment Term.

- ___ a. Divide Xenon Reactivity (Line E.16) by the Boron Worth of (Line E.10) to obtain a Xenon Reactivity Adjustment Term.
- ___ b. Record Xenon Reactivity Adjustment Term (Line E.17).



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___ 6.3.19.4 Subtract the Xenon Reactivity Adjustment Term (Line E.17) from the Required Boron Concentration (Line E.15) to obtain a Xenon Adjusted Required Boron Concentration (Line E.20).

___ 6.3.19.5 Record Xenon Adjusted Required Boron Concentration- More Than One Untrippable CEA (Line E.20).

___ 6.3.19.6 Sign for performing the SDM calculation.

Signature _____ Date _____
Performer

___ 6.3.19.7 Perform an Independent Verification the SDM calculation is correct.

Signature _____ Date _____
Independent Verifier

___ 6.3.20 **IF** (Line E.2)is greater than or equal to (Line E.20),
THEN perform the following:

___ 6.3.20.1 Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria SR 3.1.2.1 and SR 3.1.2.2: SDM - RTCBs Closed (Credit for Xenon AND More Than One Untrippable CEA)		
Current RCS Boron concentration (Line E.2) is greater than or equal to the Xenon Adjusted Required Boron Concentration- More Than ONE Untrippable CEA (Line E.20).		
Acceptance Criteria Met?	(Circle Result)	YES / NO

___ 6.3.20.2 GO TO Step 6.3.22 to check SR 3.1.2.3 requirements are met.

___ 6.3.21 **IF** Technical Specification Acceptance Criteria is NOT met,
THEN GO TO Section 8.0, Contingencies.

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17**NOTE**

____ Step 6.3.22 verifies that criticality cannot be achieved with Shutdown CEA Movement.

____ 6.3.22 **IF** RTCBs are CLOSED,
THEN perform ONE of the following to verify SR 3.1.2.3 requirements are met:

____ 6.3.22.1 **IF** all Shutdown CEAs are Fully Withdrawn,
THEN evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria**SR 3.1.2.3**

ALL Shutdown CEAs are Fully Withdrawn.

Acceptance Criteria Met?

(Circle Result)

YES / NO



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___ 6.3.22.2 **IF** ALL Regulating CEAs are Fully Inserted,
THEN verify that SR 3.1.2.1 AND SR 3.1.2.2 are satisfied in the
 Acceptance Criteria evaluation of ONE of the following procedure steps:

- ___ • Step 6.3.5.3.a.
- ___ • Step 6.3.9.1
- ___ • Step 6.3.11.3.a.
- ___ • Step 6.3.15.1
- ___ • Step 6.3.18.1
- ___ • Step 6.3.20.1

___ a. Evaluate the following SDM Technical Specification Acceptance
 Criteria:

Technical Specification Acceptance Criteria

SR 3.1.2.3

BOTH of the following SDM Acceptance Criteria are met:

- ___ • ALL Regulating CEAs are Fully Inserted
- ___ • SR 3.1.2.1 AND SR 3.1.2.2 Acceptance Criteria have been verified
 satisfied in ONE of the following procedure steps:
 - ___ • Step 6.3.5.3.a.
 - ___ • Step 6.3.9.1
 - ___ • Step 6.3.11.3.a.
 - ___ • Step 6.3.15.1
 - ___ • Step 6.3.18.1
 - ___ • Step 6.3.20.1

Acceptance Criteria Met?

(Circle Result)

YES / NO

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- ___ b. **IF** SDM criteria of Step 6.3.22.2 are NOT satisfied,
THEN ensure that Section 8.0, Contingencies actions have been initiated.

- ___ 6.3.22.3 **IF** any Regulating CEA is NOT Fully Inserted **AND** any Shutdown CEA NOT Fully Withdrawn,
THEN perform one of the following:

- ___ a. Determine Determine the Hot Zero Power (HZP) All Rods Out (ARO) Critical Boron Concentration as follows:
- ___ 1) Determine HZP ARO Critical Boron Concentration for the current EFPD using Depleted data from CDB Table 4.1.2.
- ___ 2) Record HZP ARO Critical Boron Concentration (Line E.21).
- ___ 3) Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria**SR 3.1.2.3**

RCS Boron Concentration (Line E.2) is greater than or equal to the HZP ARO Critical Boron Concentration (Line E.21).

Acceptance Criteria Met? (Circle Result) YES / NO

- ___ b. **IF** Shutdown Group CEAs are to be verified disabled to satisfy SR 3.1.2.3 requirements,
THEN perform the following:
- ___ 1) Perform Appendix A - Verification That Shutdown Group CEAs are Disabled
- ___ 2) Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria**SR 3.1.2.3**

Shutdown Group CEAs have been verified disabled.

Acceptance Criteria Met? (Circle Result) YES / NO

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___ 6.3.22.4 **IF** Technical Specification Acceptance Criteria are NOT met,
THEN GO TO ONE of the following:

- ___ • Other Step 6.3.22 Acceptance Criteria
- ___ • Section 8.0, Contingencies

End of Section 6.3

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17**6.4 Appendix J - RCS Boron Concentrations from 40OP-9ZZ23 "Outage GOP" or 40OP-9ZZ24 "SNOW Outage."**

___ 6.4.1 Select the most conservative T_{Cold} for the surveillance period as follows:

___ 6.4.1.1 **IF** Reactor Coolant Pumps (RCP's) are in service or RCS natural circulation conditions exist,
THEN select the most conservative T_{Cold} from ONE of the following:

- ___ • RCT115, RC COLD LEG 1B TEMP points from PMS or ERFDADS
- ___ • RCT125, RC COLD LEG 2A TEMP points from PMS or ERFDADS
- ___ • As directed by the SM/CRS

___ 6.4.1.2 **IF** RCP's are secured and Shutdown Cooling is in service,
THEN select the most conservative T_{Cold} from ONE of the following:

- ___ • SIA-TT-351Y, HX TO LOOPS on SIA-TR-351, Shutdown Cooling Train A
- ___ • ERFDADS point SIT351Y, Shutdown Cooling Loop A
- ___ • SIB-TT-352Y, HX TO LOOPS on SIB-TR-352, Shutdown Cooling Train B
- ___ • ERFDADS point SIT352Y, Shutdown Cooling Loop B
- ___ • As directed by the SM/CRS

___ 6.4.1.3 Record ALL of the following data in Table 1:

- ___ • Most Conservative T_{Cold} for Surveillance Period (Line 1).
- ___ • RCS Boron concentration from latest chemistry sample (Line 2).
- ___ • Date and Time of RCS Boron Sample (Line 3).
- ___ • Current Core Burnup (Line 4).
- ___ • CEA configuration (Line 5)

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___ 6.4.2 Record data in Table 1: SDM Calculation Data - No Credit for Xenon as directed by applicable procedure steps:

Table 1: SDM Calculation Data - No Credit for Xenon

Line	Procedure Step	Description	Value
1	6.4.1.3	Most Conservative T _{Cold} for Surveillance Period	
2	6.4.1.3	RCS Boron concentration from latest chemistry sample	_____ ppm
3	6.4.1.3	Date / Time of RCS Boron Sample	_____/____
4	6.4.1.3	Current Core Burnup	
5	6.4.1.3	CEA Configuration (Check 1) _____ ALL FSCEAS Fully Inserted _____ ONE FSCEA NOT Fully inserted _____ MORE than ONE FSCEA NOT Fully Inserted	
6	6.4.3.1	Required RCS Boron Concentration	RTCBs -Open (TS 3.1.1) _____ ppm
7	6.4.4.1	Required RCS Boron Concentration	RTCBs - Closed (TS 3.1.2) _____ ppm
8	6.4.5.4.a.	HZP ARO Critical Boron Concentration for the current EFPD using Depleted data from CDB Table 4.1.2.	_____ ppm

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___ 6.4.3 **IF** RTCBs are Open,
 THEN perform the following:

___ 6.4.3.1 Record the required RCS Boron concentration from ONE of the following into Table 1 (Line 6):

- ___ • 40OP-9ZZ23, Appendix J RCS Boron, Outage GOP
- ___ • 40OP-9ZZ24, Appendix J RCS Boron, SNOW OUTAGE

___ 6.4.3.2 Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria		
SR 3.1.1.1: SDM - RTCBs Open		
RCS Boron concentration of Table 1 (Line 2) is greater than or equal to the required Boron concentration of Table 1 (Line 6) - RTCBs are Open.		
Acceptance Criteria Met?	(Circle Result)	YES / NO

___ 6.4.3.3 **IF** Technical Specification Acceptance Criteria are NOT met,
 THEN GO TO Section 8.0, Contingencies.

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___ 6.4.4 **IF** RTCBs are Closed,
THEN perform the following:

___ 6.4.4.1 Record the required RCS Boron concentration from ONE of the following into Table 1 (Line 7):

- ___ • 40OP-9ZZ23, Appendix J RCS Boron, Outage GOP
- ___ • 40OP-9ZZ24, Appendix J RCS Boron, SNOW OUTAGE

___ 6.4.4.2 Evaluate the following Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria		
SR 3.1.2.1 and SR 3.1.2.2: SDM - RTCBs Closed		
RCS Boron concentration Table 1 (Line 2) is greater than or equal to the required Boron concentration of Table 1 (Line 7).		
Acceptance Criteria Met?	(Circle Result)	YES / NO

___ 6.4.4.3 **IF** Technical Specification Acceptance Criteria are met,
THEN GO TO Step 6.4.5.

___ 6.4.4.4 **IF** Technical Specification Acceptance Criteria are NOT met,
THEN GO TO Section 8.0, Contingencies.

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17**NOTE**

Step 6.4.5 verifies that criticality cannot be achieved with Shutdown CEA Movement.



6.4.5 IF RTCBs are CLOSED,
THEN perform one of the following to verify SR 3.1.2.3 requirements are met:

6.4.5.1 IF all Shutdown CEAs are Fully Withdrawn,
THEN evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria**SR 3.1.2.3**

ALL Shutdown CEAs are Fully Withdrawn.

Acceptance Criteria Met?

(Circle Result)

YES / NO

6.4.5.2 IF ALL Regulating CEAs are Fully Inserted,
THEN verify that SR 3.1.2.1 AND SR 3.1.2.2 are satisfied in the Acceptance Criteria evaluation of Step 6.4.4.2.

Technical Specification Acceptance Criteria**SR 3.1.2.3**

BOTH of the following SDM Acceptance Criteria are met:

- ALL Regulating CEAs are Fully Inserted
- SR 3.1.2.1 AND SR 3.1.2.2 Acceptance Criteria have been verified satisfied in Step 6.4.4.2.

Acceptance Criteria Met?

(Circle Result)

YES / NO

6.4.5.3 IF SDM criteria of Step 6.4.5.2 is NOT satisfied,
THEN ensure that Section 8.0, Contingencies actions have been initiated.

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- ___ 6.4.5.4 **IF** any Regulating CEA is NOT Fully Inserted **AND** any Shutdown CEA NOT Fully Withdrawn,
THEN perform one of the following:
- ___ a. Determine Determine the Hot Zero Power (HZP) All Rods Out (ARO) Critical Boron Concentration as follows:
- ___ 1) Determine HZP ARO Critical Boron Concentration for the current EFPD using Depleted data from CDB Table 4.1.2.
- ___ 2) Record HZP ARO Critical Boron Concentration (Line 8).
- ___ 3) Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria**SR 3.1.2.3**

RCS Boron Concentration (Line 2) is greater than or equal to the HZP ARO Critical Boron Concentration (Line 8).

Acceptance Criteria Met?

(Circle Result)

YES / NO

- ___ b. **IF** Shutdown Group CEAs are to be verified disabled to satisfy SR 3.1.2.3 requirements,
THEN perform the following:
- ___ 1) Perform Appendix A - Verification That Shutdown Group CEAs are Disabled
- ___ 2) Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria**SR 3.1.2.3**

Shutdown Group CEAs have been verified disabled.

Acceptance Criteria Met?

(Circle Result)

YES / NO

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___ 6.4.5.5 **IF** Technical Specification Acceptance Criteria are NOT met,
 THEN GO TO ONE of the following:

- ___ • Other Step 6.4.5 Acceptance Criteria
- ___ • Section 8.0, Contingencies

End of Section 6.4

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17**6.5 RCS Borated to COLR Refueling Boron Concentration.**

___ 6.5.1 Record ALL of the following data in Table 2:

- RCS Boron concentration from latest chemistry sample (Line 1)
- Date and Time of RCS Boron Sample (Line 2)
- COLR Required RCS Boron Concentration (Line 3)

Table 2: SDM Calculation Data

Line	Procedure Step	Description	Value
1	6.5.1	RCS Boron concentration from latest chemistry sample	_____ppm
2	6.5.1	Date / Time of RCS Boron Sample	_____/____
3	6.5.1	COLR Required RCS Boron Concentration for LCO 3.9.1	_____ ppm

___ 6.5.2 Evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria		
SR 3.1.1.1, SR 3.1.2.1, SR 3.1.2.2., SR 3.1.2.3		
RCS Boron concentration (Line 1) is greater than or equal to the COLR required RCS Boron concentration (Line 3).		
Acceptance Criteria Met?	(Circle Result)	YES / NO

___ 6.5.3 **IF** Technical Specification Acceptance Criteria is NOT met,
THEN GO TO Section 8.0, Contingencies.

End of Section 6.5**End of Section 6.0**

Shutdown Margin - Modes 3, 4, and 5

72ST-9RX14

Revision
17**7.0 RESTORATION**

- ___ 7.1 **IF** the SM/CRS directs,
THEN perform Appendix B - Verification That Shutdown Group CEA's are Restored.
- ___ 7.2 **IF** XeRho V2 was used to determine Xenon reactivity,
THEN complete a XeRho "Use Log" entry in SEATS with the following information in the "Description of Use" field:
- ___ • Unit/Cycle
 - ___ • 72ST-9RX14
 - ___ • Date and Time Completed
- ___ 7.3 **IF** SEATS is unavailable for logging use of XeRho V2,
THEN send an E-mail to "rxeng" with the "Description of Use" information.
- ___ 7.4 Ensure BOTH of the following are logged per 40DP-9OP22, Operations Logkeeping:
- ___ • Completion of this procedure
 - ___ • Procedure section(s) performed
- ___ 7.5 **IF** desired by the CRS to track time significant variables that could require additional surveillance test intervals of 72ST-9RX14,
THEN set a CORA AutoLog timer to alert the CRS of the need to perform additional surveillances.

End of Section 7.0

Shutdown Margin - Modes 3, 4, and 5

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8.0 CONTINGENCIES

___ 8.1 **IF** ANY Technical Specification Surveillance requirement is NOT satisfied,
THEN perform the following:

___ 8.1.1 Notify the SM/CRS that SDM requirements are NOT Satisfied.

___ 8.1.2 Borate the RCS at greater than or equal to 26 gpm with a solution containing greater than 4000 ppm Boron or equivalent until the required SHUTDOWN MARGIN is restored.

___ 8.1.3 Continue boration of the RCS until an RCS boron sample demonstrates the surveillance requirement is satisfied.

___ 8.1.4 Notify Reactor Engineering as soon as possible.

___ 8.1.5 Initiate a PVAR per 01DP-0AP12, Palo Verde Action Request Processing.

End of Section 8.0

9.0 REFERENCES

9.1 Implementing References

9.1.1 Core Data Book

9.1.2 Core Operating Limits Report

9.1.3 73DP-9ZZ14, Surveillance Testing

9.2 Developmental References

9.2.1 Developmental References are listed in the Basis Document.

End of Section 9.0



Shutdown Margin - Modes 3, 4, and 5

72ST-9RX14

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Appendix A Page 1 of 1

Appendix A - Verification That Shutdown Group CEAs are Disabled

___ A.1 Obtain SM/CRS permission to disable Shutdown Group CEAs

___ A.2 Open each of the following Shutdown Group CEA Breakers.

Subgroup	CEA Ckt Bkrs	Location	Required Position	Performed By
2	CB-3002	xJ-SFN-C01A Bay 1	Open	
3	CB-3003	xJ-SFN-C01A Bay 2	Open	
6	CB-3006	xJ-SFN-C01A Bay 3	Open	
7	CB-3007	xJ-SFN-C01A Bay 4	Open	
9	CB-3009	xJ-SFN-C01A Bay 5	Open	
10	CB-3010	xJ-SFN-C01A Bay 5	Open	
16	CB-3016	xJ-SFN-C01A Bay 1	Open	
19	CB-3019	xJ-SFN-C01A Bay 3	Open	
20	CB-3020	xJ-SFN-C01A Bay 3	Open	

___ A.3 Initiate a Technical Specification Component Condition Record (TSCCR) to track Shutdown CEA Subgroup status.

___ A.4 GO TO Step 6.3.22.3.b. or Step 6.4.5.4.b. to evaluate Technical Specification Acceptance Criteria.

End of Appendix A

Shutdown Margin - Modes 3, 4, and 5

72ST-9RX14

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Appendix B Page 1 of 1

Appendix B - Verification That Shutdown Group CEA's are Restored

___ B.1 Obtain SM/CRS permission to perform Shutdown Groups Restoration

___ B.2 Close each of the following Shutdown Group Breakers.

Subgroup	CEA Ckt Bkrs	Location	Required Position	Performed By
2	CB-3002	xJ-SFN-C01A Bay 1	Closed	
3	CB-3003	xJ-SFN-C01A Bay 2	Closed	
6	CB-3006	xJ-SFN-C01A Bay 3	Closed	
7	CB-3007	xJ-SFN-C01A Bay 4	Closed	
9	CB-3009	xJ-SFN-C01A Bay 5	Closed	
10	CB-3010	xJ-SFN-C01A Bay 5	Closed	
16	CB-3016	xJ-SFN-C01A Bay 1	Closed	
19	CB-3019	xJ-SFN-C01A Bay 3	Closed	
20	CB-3020	xJ-SFN-C01A Bay 3	Closed	

___ B.3 Perform an update of the Technical Specification Condition Record (TSCCR).

End of Appendix B

Shutdown Margin - Modes 3, 4, and 5

72ST-9RX14

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Appendix C Page 1 of 1

Appendix C - All FSCEA's Fully Inserted - Data Collection

Line	Procedure Step	Description	Value
C.1	6.1.3	Most Conservative T _{Cold} for Surveillance Period	_____ °F
C.2	6.1.3	RCS Boron concentration from latest chemistry sample	_____ ppm
C.3	6.1.3	Date and Time of RCS Boron Sample	_____/____/____
C.4	6.1.3	Current Core Burnup	_____ EFPD
C.5	6.1.4.2	Xenon Free Required RCS Boron Concentration	RTCBs -Open (TS 3.1.1) _____ ppm
C.6	6.1.5.2	Xenon Free Required RCS Boron Concentration	RTCBs- Closed (TS 3.1.2) _____ ppm
C.7	6.1.7	Xenon Reactivity (Check One)	<input type="checkbox"/> Xerho V2 <input type="checkbox"/> Value provided by reactor engineering using SIMULATE-3 _____ pcm
C.8	6.1.9	Boron Worth	_____ (-) pcm/ppm
Calculated Xenon Adjustment Term			
(-) _____ pcm / (-) _____ pcm/ppm = _____ ppm <div style="display: flex; justify-content: space-around;"> Line C.7 Line C.8 Line C.9 </div>			
C.9	Calculated Value	Xenon Adjustment Term	_____ ppm
Xenon Adjusted Required Boron Concentration			
_____ ppm - _____ ppm = _____ ppm <div style="display: flex; justify-content: space-around;"> Lines C.5 or C.6 Line C.9 Line C.10 </div>			
C.10	Calculated Value	Xenon Adjusted Required RCS Boron Concentration	_____ ppm

End of Appendix C

Shutdown Margin - Modes 3, 4, and 5

72ST-9RX14

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Appendix D Page 1 of 2

Appendix D - Any FSCEA Not Fully Inserted with RTCBs Open - Data Collection

Line	Procedure Step	Description	Value
D.1	6.2.3	Most Conservative T_{Cold} for Surveillance Period	_____ °F
D.2	6.2.3	RCS Boron concentration from latest chemistry sample	_____ ppm
D.3	6.2.3	Date and Time of RCS Boron Sample	
D.4	6.2.3	Current Core Burnup	_____ EFPD
D.5	6.2.4.2	Xenon Free Required RCS Boron Concentration	_____ ppm
D.6	6.2.4.4	Worst Stuck CEA Pair Worth	(-) _____ pcm
D.7	6.2.4.6	Worst Stuck CEA Worth	(-) _____ pcm
Worth Penalty for One Untrippable CEA			
<div> <div>_____ pcm - _____ pcm = _____ pcm</div> <div>Line D.6 Line D.7 Line D.8</div> </div>			
D.8	Calculation	Worth Penalty for One Untrippable CEA	(-) _____ pcm
D.9	6.2.4.9,	SDM Boron Worth	(-) _____ pcm/ppm
Boron Concentration Penalty for One Untrippable CEA			
<div> <div>(-) _____ pcm / (-) _____ pcm/ppm = _____ ppm</div> <div>Line D.8 Line D.9 Line D.10</div> </div>			
D.10	Calculated Value	Boron Concentration Penalty for ONE Untrippable CEA	_____ ppm
D.11	6.2.4.12	Total number of Untrippable CEAs	_____ CEAs
Total Untrippable CEA Boron Concentration Penalty			
<div> <div>_____ ppm x _____ = _____ ppm</div> <div>Line D.10 Line D.11 Line D.12</div> </div>			
D.12	Calculated Value	Total Untrippable CEA Boron Concentration Penalty	_____ ppm

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Page 2 of 2

Line	Procedure Step	Description	Value
Untrippable CEA Required RCS Boron Concentration			
<div> <div>_____ ppm + _____ ppm = _____ ppm</div> <div>Line D.5 Line D.12 Line D.13</div> </div>			
D.13	Calculated Value	Untrippable CEA Xenon Free Required RCS Boron Concentration	_____ ppm
D.14	6.2.10.2	Xenon Reactivity (Check One) _____ Xerho V2 <div>Value provided by reactor engineering using SIMULATE-3</div>	_____ pcm
Calculated Xenon Adjustment Term			
<div> <div>(-) _____ pcm / (-) _____ pcm/ppm = _____ ppm</div> <div>Line D.14 Line D.9 Line D.15</div> </div>			
D.15	Calculated Value	Xenon Reactivity Adjustment Term	(+) _____ ppm
Xenon Adjusted Required Boron Concentration			
<div> <div>_____ ppm - _____ ppm = _____ ppm</div> <div>Line D.13 Line D.15 Line D.16</div> </div>			
D.16	Calculated Value	Xenon Adjusted Required Boron Concentration	_____ ppm
D.17	6.2.7	COLR Refueling Boron Concentration	_____ ppm

End of Appendix D

Shutdown Margin - Modes 3, 4, and 5

72ST-9RX14

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Appendix E Page 1 of 3

Appendix E - Any FSCEA Not Fully Inserted with RTCBs Closed - Data Collection

Line	Procedure Step	Description	Value
E.1	6.3.1.3	Most Conservative T _{Cold} for Surveillance Period	_____ °F
E.2	6.3.1.3	RCS Boron concentration from latest chemistry sample	_____ ppm
E.3	6.3.1.3	Date and Time of RCS Boron Sample	
E.4	6.3.1.3	Current Core Burnup	_____ EFPD
E.5	6.3.5.2	Xenon Free Required RCS Boron Concentration for NO Untrippable CEAs	_____ ppm
E.6	6.3.11.2	Xenon Free Required RCS Boron Concentration for ONE Untrippable CEA	_____ ppm
E.7	6.3.17.3.b.	Worst Stuck CEA Pair Worth	(-) _____ pcm
E.8	6.3.17.3.d.	Worst Stuck CEA Worth	(-) _____ pcm

Worth Penalty for One Untrippable CEA

_____ pcm - _____ pcm = _____ pcm

Line E.7 Line E.8 Line E.9

E.9	Calculated Value	Worth Penalty for One Untrippable CEA	(-) _____ pcm
E.10	6.3.6.4, 6.3.17.5,	SDM Boron Worth	(-) _____ pcm/ppm

Boron Concentration Penalty for ONE Untrippable CEA

(-) _____ pcm / (-) _____ pcm/ppm = _____ ppm

Line E.9 Line E.10 Line E.11

E.11	Calculated Value	Boron Concentration Penalty for ONE Untrippable CEA	_____ ppm
E.12	6.3.17.6.c.	Total number of Untrippable CEAs	_____ CEAs

Calculation of N-1

_____ CEAs - 1 = _____ CEAs

Line E.12 Line E.13

Shutdown Margin - Modes 3, 4, and 5

72ST-9RX14

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Appendix E Page 3 of 3

Line	Procedure Step	Description	Value
E.18	Calculated Value	Xenon Adjusted Required RCS Boron Concentration-No Untrippable CEA	_____ ppm
Xenon Adjusted Required Boron Concentration - One Untrippable CEA			
<p>_____ ppm - _____ ppm = _____ ppm</p> <p>Line E.6 Line E.17 Line E.19</p>			
E.19	Calculated Value	Xenon Adjusted Required RCS Boron Concentration-One Untrippable CEA	_____ ppm
Xenon Adjusted Required Boron Concentration - More Than One Untrippable CEA			
<p>_____ ppm - _____ ppm = _____ ppm</p> <p>Line E.15 Line E.17 Line E.20</p>			
E.20	Calculated Value	Xenon Adjusted Required RCS Boron Concentration-More Than One Untrippable CEA	_____ ppm
E.21	6.3.22.3.a.2)	HZP ARO Critical Boron Concentration	_____ ppm
E.22	6.3.17.9	COLR Refueling Boron Concentration	_____ ppm

End of Appendix E

Electronic Procedure Change Record

Procedure No.: (1)		Revision No.: (2)	Category: (3)	Expedite? (4)
Title: (5)				
Procedure Action: (6)	Full Basis Check? (7)	NAD Review: (8)	PRG Review: (9)	Upgraded Procedures: (10)
EOP? (11)	Dry Cask? (12)		Decommissioning Doc? (13)	
AD Review: (14)	10CFR50.59/72.48 Required? (15)	50.59/72.48 Doc Number:		
<div style="background-color: #f0f0f0; padding: 2px;">Text does not automatically roll to continuation page.</div> AD Review - Continuation (16) <input type="checkbox"/> Yes				
Applicability Determination performed by: (17)				
Is Environmental Screening Required?: (18) <input type="checkbox"/> No (done) <input type="checkbox"/> Yes ⇒		Env. Reg./Permit Review req'd? (19) <input type="checkbox"/> No <input type="checkbox"/> Yes ⇒ (Use 91DP-0EN02, App. A) Screening performed by:		
		If "Yes" send 91DP-0EN02, Appendix A to Environmental (20) Scrn Log Number:		
Procedure Preparer: (21)		IQR Approval Recommendation: (22)		
NAD Concurs (if required): (23)		PRG Concurs (if required): (24)		
Approval: (25)		Effective Date (Time Optional): (26)		
Summary of Change (include list of all PCRs incorporated): (27)				
<div style="background-color: #f0f0f0; padding: 2px;">Text does not automatically roll to continuation page.</div> Change Summary - Continuation (28) <input type="checkbox"/> Yes				



RO ADMIN JPM A3
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

JPM BASIS INFORMATION

TASK:	1290310301 Perform a Tech Review of a Permit						
TASK STANDARD:	Tech Review a Tag Assignment Sheet and identify three (3) errors						
K/A:	2.2.13		K/A RATING:	RO:	4.1	SRO:	4.3
10 CFR 55:	45(12)						
APPLICABLE POSITION(S):	RO		VALIDATION TIME:	20 minutes			
REFERENCES:	40DP-9OP29, Power Block Clearance and Tagging, Revision 58 Drawing 01-E-DWF-0001 , Drawing 01-E-DWB-0001 Drawing 01-M-DWP-0002						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR			PLANT		OTHER	X

JPM TYPE

Time Critical? (Yes/No) **No** Alternative Path? (Yes/No) **No**
PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Tom Stahler Date: 5/03/2003

Revised By: Rusty Quick Date: 04/15/15

Technical Review Operations Approval

Training Approval

(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: Date:

Evaluator Name:

Time to complete: Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR #

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Planning organization for resolution.



RO ADMIN JPM A3
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1. SIMULATOR SETUP:

- A. IC#: N/A (May be performed in the simulator or classroom, NO setup required)
- B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

- C. SPECIAL INSTRUCTIONS:
 - None
- D. REQUIRED CONDITIONS:
 - None
- E. SIMULATOR EVALUATION PRE-CHECK
 - ☐ Correct IC
 - ☐ Alarm Silence Off
 - ☐ Procedures available, page checked, and clean
 - ☐ For JPMs administered during transients, another instructor available to control plant parameters.
 - ☐ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- 40DP-9OP29, Power Block Clearance and Tagging, Revision **58**,
- Drawing 01-E-DWF-0001
- Drawing 01-E-DWB-0001
- Drawing 01-M-DWP-0002



**RO ADMIN JPM A3
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

ALL JPMs

- You may use any source of information normally available.

INITIAL CONDITIONS:

- Unit 1 is 100% power.
- The 'B' Demineralized Water Pump (DWN-P05B) has a severe seal leak on the pump. The CRS has directed that the pump be isolated and a clearance hung to prevent spilling water.
- Clearance **X-XXXX-X** was generated manually due to the Site Work Management System (SWMS) being down.

INITIATING CUE:

- The CRS has directed you to perform a Technical Review of the Tag Assignment Sheet for Clearance **X-XXXX-X**.
- Identify errors on the permit.

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) following a JPM Step number denotes a Critical Step.
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.



RO ADMIN JPM A3
PVNGS JOB PERFORMANCE MEASURE
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JPM START TIME:

	STEP	CUE	STANDARD
1. *	<p>Identifies one (1) error on the Tag Assignment Sheet.</p> <p>Tag 2 has the wrong circuit breaker identified.</p>	<p>EXAMINER NOTE:</p> <p>The order of identification of the errors in steps 1, 2, and 3 of this JPM is not critical.</p>	<p>Examinee determines the following discrepancy:</p> <p>Tag 2 is the wrong circuit breaker (breaker is for the “A” pump) (should be 1E-NHN-M1523).</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			

	STEP	CUE	STANDARD
2. *	<p>Identifies one (1) error on the Tag Assignment Sheet.</p> <p>Tag 5 has the wrong position (OPEN) for the discharge valve.</p>		<p>Examinee determines the following discrepancy:</p> <p>Tag 5 has wrong position (OPEN) for the discharge valve (should be CLOSED).</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



RO ADMIN JPM A3
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	STEP	CUE	STANDARD
3. *	Identifies one (1) error on the Tag Assignment Sheet. Tag 3 has the wrong suction valve identified.		Examinee determines the following discrepancy: Tag 3 has the wrong suction valve. (Should be V042 vs V045)
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



RO ADMIN JPM A3
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APPLICANT

INITIAL CONDITIONS:

- Unit 1 is 100% power.
- The 'B' Demineralized Water Pump (DWN-P05B) has a severe seal leak on the pump. The CRS has directed that the pump be isolated and a clearance hung to prevent spilling water.
- Clearance **X-XXXX-X** was generated manually due to the Site Work Management System (SWMS) being down.

INITIATING CUE:

- The CRS has directed you to perform a Technical Review of Clearance **X-XXXX-X**.
- Identify errors on the permit.

APPLICANT

Palo Verde

2015 NRC EXAM RO A3 – KEY (Rev. 1)

Nuclear Generating Station

Tag Assignment Sheet

Page 1 of 1

Unit No: <u>1</u>			Clearance No: <u>X-XXXX-X</u>					
Tag No.	Equipment ID.	Tag Color	Tag Placement				Tag Removal	
			Hang Sequence	Component Position	Placed By	Verified By	Restore Sequence	Restore Position
1	1J-DWN-HS29B, Handswitch for DWN-P05B	Yellow	1	* Breaker tagged	Error #1: Wrong breaker. Should be M1523.			
2	1E-NHN-M1318, 480VAC Breaker for DWN-P05B	Red	2	OPEN				
3	1P-DWN-V045 DWN-P05B Suct Valve	Red	3	CLOSED	Error #2: Wrong valve. Should be V042.			
4	1P-DWN-V043 DWN-P05B Recirc Valve	Red	3	CLOSED				
5	1P-DWN-V051 DWN-P05B Disch Valve	Red	3	OPEN	Error #1: Wrong valve position. Should be CLOSED.			
6	1P-DWN-V353 DWN-P05B Vent Valve	Yellow	4	* Open as needed to vent OSHA DESIGNATED VENT/DRAIN VALVE				
7	1P-DWN-V355 DWN-P05B Drain Valve	Yellow	4	* Open as needed to drain OSHA DESIGNATED VENT/DRAIN VALVE				

Palo Verde

Nuclear Generating Station

2015 NRC EXAM RO A3 – APPLICANT (Rev. 1)

Tag Assignment Sheet

Page 1 of 1

Unit No: <u>1</u>			Clearance No: <u>X-XXXX-X</u>					
Tag No.	Equipment ID.	Tag Color	Tag Placement				Tag Removal	
			Hang Sequence	Component Position	Placed By	Verified By	Restore Sequence	Restore Position
1	1J-DWN-HS29B, Handswitch for DWN-P05B	Yellow	1	* Breaker tagged				
2	1E-NHN-M1318, 480VAC Breaker for DWN-P05B	Red	2	OPEN				
3	1P-DWN-V045 DWN-P05B Suct Valve	Red	3	CLOSED				
4	1P-DWN-V043 DWN-P05B Recirc Valve	Red	3	CLOSED				
5	1P-DWN-V051 DWN-P05B Disch Valve	Red	3	OPEN				
6	1P-DWN-V353 DWN-P05B Vent Valve	Yellow	4	* Open as needed to vent OSHA DESIGNATED VENT/DRAIN VALVE				
7	1P-DWN-V355 DWN-P05B Drain Valve	Yellow	4	* Open as needed to drain OSHA DESIGNATED VENT/DRAIN VALVE				



RO ADMIN JPM A4
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

JPM BASIS INFORMATION

TASK:	1290020301 Conduct On Shift Operations IAW Conduct of Shift Operations						
TASK STANDARD:	Determine total dose, authorization needed to receive dose, and area posting level						
K/A:	2.3.13		K/A RATING:	RO:	3.4	SRO:	3.8
10 CFR 55:	43.4, 45.9, 45.10						
APPLICABLE POSITION(S):	RO		VALIDATION TIME:	20 minutes			
REFERENCES:	75DP-9RP01, Radiation Exposure and Access Control, Revision 20 and 75RP-0RP01, Radiological Posting and Labeling, Revision 30						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X	

JPM TYPE

Time Critical? (Yes/No) **No** Alternative Path? (Yes/No) **No**
PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Alan Malley Date: 05/18/2010
Revised By: Rusty Quick Date: 04/15/2015

Technical Review Operations Approval
Training Approval
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: Date:

Evaluator Name:

Time to complete: Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR #

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Planning organization for resolution.



RO ADMIN JPM A4
PVNGS JOB PERFORMANCE MEASURE
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1. SIMULATOR SETUP:

N/A

2. SPECIAL TOOLS/EQUIPMENT:

- Calculator
- 75DP-9RP01, Radiation Exposure and Access Control
- 75RP-0RP01, Radiological Posting and Labeling



RO ADMIN JPM A4
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam
TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- When applicable comply with the REP. **IF** it is not possible to enter an area **THEN** it may be permissible to discuss the equipment to be operated. **DO NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.



RO ADMIN JPM A4
PVNGS JOB PERFORMANCE MEASURE
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INITIAL CONDITIONS:

- The CRS directs you to enter the Radiation Control Area (RCA) to perform a task which you are the only qualified person on site to perform this task.
- You are **55** years old.
- Your lifetime cumulative exposure is **37.45** Rem.
- Your **5** year cumulative exposure to date is **6455** mrem.
- Your total dose exposure this year has been **1990** mrem.
- The radiation dose rate in the immediate work area (including transit path) is **750** mrem/hr.
- The highest dose rate in the room is **900** mrem/hr.
- The task will take **2** hours.

INITIATING CUE:

- Based on the information in the Initial Conditions, determine the following:
 1. What is your total dose for the year upon completion of this task?
 2. What is the highest approval necessary to receive this dose?
 3. Should this area be posted as a Radiation area, High Radiation area, Locked High Radiation area, or Very High Radiation area?

Record your answers in the area provided below:

- Total dose for the year upon completion of this task
- List whose approval (highest level of management) would be necessary for any hold points that would be exceeded. (Assume authorization for current dose levels have already been obtained.)
- This area should be posted as a _____ area



RO ADMIN JPM A4
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) following a JPM Step number denotes a Critical Step.
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- **IF** this is the first JPM of the set, **THEN** ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify unit Shift Manager of in-plant JPM performance.
- Performance of this JPM will require entry into areas with alarmed doors. Security requirements must be observed.
- Locked components (breakers, valves, etc.) may be involved. No attempt will be made to actually operate any components.



RO ADMIN JPM A4
PVNGS JOB PERFORMANCE MEASURE
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JPM START TIME:

	STEP	CUE	STANDARD
1. *	Examinee determines total dose after completion of this task.	EXAMINER NOTE: $1990 + (750 \text{ mr/hr} \times 2\text{hrs}) = 3490 \text{ mrem.}$	Examinee determines total dose is 3490 mrem.
SAT / UNSAT Comments (required for UNSAT):			



RO ADMIN JPM A4
PVNGS JOB PERFORMANCE MEASURE
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	STEP	CUE	STANDARD
2. *	Examinee determines whose permission is required to exceed receive this dose.	<p>EXAMINER NOTE:</p> <p>75DP-9RP01, Step 4.11.2.2 (and Appendix F):</p> <p>In addition to the following approvals, any request for a higher administrative exposure hold point which would allow a worker's cumulative lifetime exposure (in rem) to exceed the worker's age (in years) are reviewed and approved by the ALARA Committee Chairman.</p> <p>(a) For a Hold Point higher than 1500 mrem/year, RP Department Leader approval required.</p> <p>(b) For a Hold point higher than 2000 mrem/year Radiation Protection Manager approval required.</p> <p>(c) For a Hold Point higher than 2500 mrem/year up to 4000 mrem/year, the ALARA Committee review and approval is required (as signified by the signature of an ALARA Committee Chairman).</p> <p>EXAMINER NOTE:</p> <p>1990 + (750 mr/hr x 2hrs) = 3490 mrem.</p>	Examinee determines that a ALARA Committee Chairman approval is required to receive this dose since the total dose would exceed the 2500 mrem/yr administrative exposure limit.
<p>SAT / UNSAT</p> <p>Comments (required for UNSAT):</p>			



RO ADMIN JPM A4
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	STEP	CUE	STANDARD
3. *	Examinee determines the posting for the area.	EXAMINER NOTE: Per 75RP-0RP01, Step 3.9: High Radiation Area Posting Areas in which the intensity of radiation is ≥ 100 mrem/hr but < 1000 mrem/hr shall be barricaded and conspicuously posted as a high radiation area with radiation warning sign(s) bearing the following words:	Examinee should determine that this area should be posted as a High Radiation Area since it is ≥ 100 mrem/hr and < 1000 mrem/hr.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using EP-0800, ERO Comment form, and forwarded to Emergency Planning organization for resolution.

NORMAL TERMINATION POINT



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ANSWER KEY

1. Total dose for the year upon completion of this task - 3490
2. Whose permission is required to receive this dose - ALARA Committee Chairman
3. This area should be posted as a: High Radiation Area (HRA)

ANSWER KEY



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APPLICANT

INITIAL CONDITIONS:

- The CRS directs you to enter the Radiation Control Area (RCA) to perform a task which you are the only qualified person on site to perform this task.
- You are **55** years old.
- Your lifetime cumulative exposure is **37.45** Rem.
- Your **5** year cumulative exposure to date is **6455** mrem.
- Your total dose exposure this year has been **1990** mrem.
- The radiation dose rate in the immediate work area (including transit path) is **750** mrem/hr.
- The highest dose rate in the room is **900** mrem/hr.
- The task will take **2** hours.

INITIATING CUE:

Based on the information in the Initial Conditions, determine the following:

1. What is your total dose for the year upon completion of this task?
2. What is the highest approval necessary to receive this dose?
3. Should this area be posted as a Radiation area, High Radiation area, Locked High Radiation area, or Very High Radiation area?

Record your answers in the area provided below:

Total dose for the year upon completion of this task is _____.

Whose permission is required to receive this dose? _____

This area should be posted as a _____ area.

APPLICANT



SRO ADMIN JPM A5
PVNGS JOB PERFORMANCE MEASURE
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JPM BASIS INFORMATION

TASK:	1290020301 Conduct of Shift Operations							
TASK STANDARD:	Determined which Reactor Operator(s) is(are) available to take the shift without exceeding Fatigue Rule requirements AND determined which Reactor Operator(s) have exceeded Fatigue Rule requirements.							
K/A:	2.1.5			K/A RATING:	RO:	2.9	SRO:	3.9
10 CFR 55:	45(b)(12)							
APPLICABLE POSITION(S):	SRO		VALIDATION TIME:	20 minutes				
REFERENCES:	01DP-0AP17, Managing Personnel Fatigue 10 CFR Part 26 Subpart I							
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X		

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **No**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Adam Rasmussen Date: 10/10/2013

Revised By: Rusty Quick Date: 03/30/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



**SRO ADMIN JPM A5
PVNGS JOB PERFORMANCE MEASURE
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1. SIMULATOR SETUP:

N/A

2. SPECIAL TOOLS/EQUIPMENT:

- 01DP-0AP17, Managing Personnel Fatigue, available
- JPM was written using Revision 8 of 01DP-0AP17, Managing Personnel Fatigue. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.
- PVNGS Standards and Expectations, Rev 6 available
- Calculator
- Pen and Paper

3. JPM PERFORMANCE:

N/A



**SRO ADMIN JPM A5
PVNGS JOB PERFORMANCE MEASURE
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TASK CONDITIONS**

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.



**SRO ADMIN JPM A5
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- You are the CRS on Unit 1 on night shift.
- A Reactor Operator just called in on short notice PTO for tomorrow (Tuesday dayshift).
- This will put the manning at below minimum allowed.
- EmCenter Fatigue Management software is not available while a software patch is being installed.
- You have accumulated the previous week's work hours of four Reactor Operators (located on following page).
- All four Reactor Operators have averaged 3 days off per week in the previous 5 week period.
- Assume all hours are day shift non-outage hours.

INITIATING CUE:

You have been directed to:

- Determine which of the following Reactor Operators (if any) can be called in to fill the vacant position for 12 hours.
- Determine if any of the operators have exceeded the Fatigue Rule requirements during the past week.

Provide your answers in the spaces below.

Operator #1 CAN / CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)
Operator #2 CAN / CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)
Operator #3 CAN / CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)
Operator #4 CAN / CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)
Have any of the operators exceeded the Fatigue Rule requirements during the past week? If yes, which operator(s)? <div style="display: flex; justify-content: space-between; margin-top: 10px;"><div style="text-align: center;">YES / NO (CIRCLE ONE)</div><div style="text-align: center;">If YES: Reactor Operator(s) (CIRCLE) #1 #2 #3 #4</div></div>

Continued on next page



**SRO ADMIN JPM A5
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	Reactor Operator #1 Schedule	Reactor Operator #2 Schedule	Reactor Operator #3 Schedule	Reactor Operator #4 Schedule
Saturday 10/24/2010	Off	Off	Off	On Shift – 12 hours
Sunday 10/25/2010	Off	On Shift – 12 hours	Off	Off
Monday 10/26/2010	On Shift – 12 hours	Off	On Shift – 12 hours	Off
Tuesday 10/27/2010	Off	Off	On Shift – 12 hours	On Shift – 12 hours
Wednesday 10/28/2010	Tagging Office – 10 hours	On Shift – 12 hours	On Shift – 12 hours	On Shift – 12 hours
Thursday 10/29/2010	Tagging Office – 10 hours	On Shift – 12 hours	On Shift – 12 hours	On Shift – 12 hours
Friday 10/30/2010	Tagging Office – 10 hours (Called out for emergent work)	On Shift – 12 hours	Participated in Unannounced E-Plan Drill – 8 hours	On Shift – 12 hours
Saturday 10/31/2010	On Shift – 12 hours	On Shift – 12 hours	Off	On Shift – 12 hours
Sunday 11/01/2010	Tagging Office – 10 hours (Called out for emergent work)	Off	On Shift – 12 hours	On Shift – 14 hours (Called in early for pre- shift briefing for special evolution)
Monday 11/02/2010	Just In Time Training (JITT) for upcoming plant shutdown – 10 hours	On Shift – 14.5 hours (held over 2.5 hours due to his relief being late)	Off	Off
Tuesday 11/03/2010	Operator needed to work this day 12 hours			



**SRO ADMIN JPM A5
PVNGS JOB PERFORMANCE MEASURE
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INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) following a JPM Step number denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.



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ANSWER KEY

Operator #1 CAN CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)
Operator #2 CAN CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)
Operator #3 CAN CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)
Operator #4 CAN CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)
Have any of the operators exceeded the Fatigue Rule requirements during the past week? If yes, which operator(s)? YES NO (CIRCLE ONE) If YES: Reactor Operator(s) (CIRCLE) #1 #2 #3 #4

ANSWER KEY



SRO ADMIN JPM A5
PVNGS JOB PERFORMANCE MEASURE
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JPM START TIME:

	STEP	CUE	STANDARD
1. *	Examinee reviews the work schedule for Reactor Operator #1 to determine if that operator can be called in to fill the position on Tuesday.	EVALUATOR NOTE: Operator #1 cannot because he would exceed 72 hours in a 7 day period.	Examinee determined that Operator #1 CANNOT be called in to fill the position for Tuesday.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
2. *	Examinee reviews the work schedule for Reactor Operator #2 to determine if that operator can be called in to fill the position on Tuesday.	EVALUATOR NOTE: Operator #2 cannot because he would exceed the following: 72 hours in a 7 day period 26 hours in a 48 hour period	Examinee determined that Operator #2 CANNOT be called in to fill the position for Tuesday.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
3. *	Examinee reviews the work schedule for Reactor Operator #3 to determine if that operator can be called in to fill the position on Tuesday.		Examinee determined that Operator #3 CAN be called in to fill the position for Tuesday.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
4. *	Examinee reviews the work schedule for Reactor Operator #4 to determine if that operator can be called in to fill the position on Tuesday.	EVALUATOR NOTE: Operator #4 cannot because he would exceed 72 hours in a 7 day period.	Examinee determined that Operator #4 CANNOT be called in to fill the position for Tuesday.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
5. *	Examinee reviews the work schedule for Reactor Operators to determine if any operator has exceeded the Fatigue Rule requirements.		Examinee determined that Operator #4 HAS exceeded the requirements for Fatigue Rule due to working 74 hours in a 7 day period.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT



SRO ADMIN JPM A5
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

APPLICANT

INITIAL CONDITIONS:

- You are the CRS on Unit 1 on night shift
- A Reactor Operator just called in on short notice PTO for tomorrow (Tuesday dayshift)
- This will put the manning at below minimum allowed
- EmpCenter Fatigue Management software is not available while a software patch is being installed
- You have accumulated the previous week's work hours of four Reactor Operators (located on following page)
- All four Reactor Operators have averaged 3 days off per week in the previous 5 week period
- Assume all hours are day shift non-outage hours

INITIATING CUE:

You have been directed to:

1. Determine which of the following Reactor Operators (if any) can be called in to fill the vacant position for 12 hours.
2. Determine if any of the operators have exceeded the Fatigue Rule requirements during the past week.

Provide your answers in the spaces below:

Operator #1 CAN / CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)

Operator #2 CAN / CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)

Operator #3 CAN / CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)

Operator #4 CAN / CANNOT fill the position on Tuesday for 12 hours. (CIRCLE ONE)

Have any of the operators exceeded the Fatigue Rule requirements during the past week?

If yes, which operator(s)?

YES / NO (CIRCLE ONE)

If YES: Reactor Operator(s) (CIRCLE)

#1 #2 #3 #4

Continued on next page

APPLICANT



APPLICANT

SRO ADMIN JPM A5
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	Reactor Operator #1 Schedule	Reactor Operator #2 Schedule	Reactor Operator #3 Schedule	Reactor Operator #4 Schedule
Saturday 10/24/2010	Off	Off	Off	On Shift – 12 hours
Sunday 10/25/2010	Off	On Shift – 12 hours	Off	Off
Monday 10/26/2010	On Shift – 12 hours	Off	On Shift – 12 hours	Off
Tuesday 10/27/2010	Off	Off	On Shift – 12 hours	On Shift – 12 hours
Wednesday 10/28/2010	Tagging Office – 10 hours	On Shift – 12 hours	On Shift – 12 hours	On Shift – 12 hours
Thursday 10/29/2010	Tagging Office – 10 hours	On Shift – 12 hours	On Shift – 12 hours	On Shift – 12 hours
Friday 10/30/2010	Tagging Office – 10 hours (Called out for emergent work)	On Shift – 12 hours	Participated in Unannounced E-Plan Drill – 8 hours	On Shift – 12 hours
Saturday 10/31/2010	On Shift – 12 hours	On Shift – 12 hours	Off	On Shift – 12 hours
Sunday 11/01/2010	Tagging Office – 10 hours (Called out for emergent work)	Off	On Shift – 12 hours	On Shift – 14 hours (Called in early for pre- shift briefing for special evolution)
Monday 11/02/2010	Just In Time Training (JITT) for upcoming plant shutdown – 10 hours	On Shift – 14.5 hours (held over 2.5 hours due to his relief being late)	Off	Off
Tuesday 11/03/2010	Operator needed to work this day 12 hours			

APPLICANT



SRO ADMIN JPM A6
PVNGS JOB PERFORMANCE MEASURE
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JPM BASIS INFORMATION

TASK:	1230050101 Perform a Shutdown Margin Calculation						
TASK STANDARD:	Review a Shutdown Margin Calculation, identify 4 errors, annotate corrections						
K/A:	2.1.37	K/A RATING:	RO:	4.3	SRO:	4.6	
10CFR55:	45(b)(12)						
APPLICABLE POSITION(S):	SRO	VALIDATION TIME:	20 minutes				
REFERENCES:	72ST-9RX14, Shutdown Margin – Modes 3, 4, and 5; Revision 17 Core Data Book Unit 1 Cycle 19						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X	

JPM TYPE

Time Critical? (Yes/No) **No** Alternative Path? (Yes/No) **No**
PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Phil Capehart Date: 06/08/2005

Revised By: Rusty Quick Date: 03/27/2015

Technical Review Operations Approval

Training Approval

(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: Date:

Evaluator Name:

Time to complete: Minutes GRADE (Circle One) SAT / UNSAT *

A grade of UNSAT for E-Plan JPMs requires a PVAR to be written, remediation, and re-evaluation. PVAR #

Issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form EP-0800 and forwarded to the Emergency Preparedness organization for resolution.



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1. SPECIAL TOOLS/EQUIPMENT:

- Copy of completed Shutdown Margin Calculation, 72ST-9RX14, with induced errors.
- Copy available of Unit 1 Cycle 19 Core Data Book
- Calculator



**SRO ADMIN JPM A6
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- When applicable comply with the REP. **IF** it is not possible to enter an area **THEN** it may be permissible to discuss the equipment to be operated. **DO NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.



SRO ADMIN JPM A6
PVNGS JOB PERFORMANCE MEASURE
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INITIAL CONDITIONS:

- You are the CRS in Unit 1.
- Unit 1 was manually tripped at **0700** today due to a feedwater problem.
- ALL Reactor Trip breakers opened on the trip.
- ALL Full Strength CEA inserted on the trip.
- The plant has been stabilized at **565°F**.
- Current boron concentration is **900 ppm** from the latest chemistry sample taken at **0815** today.
- The Unit is at **180** EFPD.
- No cool down is planned.
- 72ST-9RX14, Shutdown Margin – Modes 3, 4, and 5 is complete.
 - This ST was completed for the next **24** hours.
 - The Shift Manager directed the crew to use **565°F** as the Most Conservative Tcold for the surveillance period.
 - Reactor Engineering has provided the following data for Xenon Worth:
 - From the XeRho V2 Code: **-2332** pcm.
 - From SIMULATE-3: **-2375** pcm

INITIATING CUE:

Your tasks are to:

1. Review the given shutdown margin calculation.
2. Identify any errors (non-clerical, non-typos)
3. Provide the correct information for the errors on the following page (the number of lines on the answer sheet is not indicative of the number of errors).

Interpolation between different graphs of the Core Data book is not required. Choose the graph(s) that is/are closest to the given conditions.



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INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) following a JPM Step number denotes a Critical Step.
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- **IF** this is the first JPM of the set, **THEN** ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify unit Shift Manager of in-plant JPM performance.
- Performance of this JPM will require entry into areas with alarmed doors. Security requirements must be observed.
- Locked components (breakers, valves, etc.) may be involved. No attempt will be made to actually operate any components.



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PVNGS JOB PERFORMANCE MEASURE
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ANSWER KEY

Step Number*:	Error:
Step 6.1.4.2 or Appendix C Line C.5	The value entered on Line C.5 of Appendix C is not correct. Value should be between “ 1132 and 1158 ”, versus 1335.
Steps 6.1.6 and 6.1.7 or Appendix C Line C.6	Examinee determines that for Line C.7, the most (-2375 pcm), versus the least (-2332 pcm), negative value for Xenon Reactivity was used.
Step 6.1.10 or Appendix C Line C.9	Examinee determines that for Line C.9, a math error occurred. The quotient should be “ 305 ” versus 30.5.
Step 6.1.16 or Appendix C Line C.10	Examinee determines that the result incorrectly shows that Current RCS Boron Concentration (line C.2) is less than the Xenon Adjusted Required Boron Concentration (Line C.10) and that the crew is required to GO TO Section 8.0, Contingencies. Correct result is that Line C.2 is greater than Line C.10 and Step 6.17 applies with Acceptance Criteria Met.
* Identification of the step numbers is not critical	

ANSWER KEY



**SRO ADMIN JPM A6
PVNGS JOB PERFORMANCE MEASURE
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JPM START TIME:

	STEP	CUE	STANDARD
1. *	Step 6.1.4.2 Examinee reviews Shutdown Margin Calculation.	EXAMINER NOTE: The value entered on Line C.5 is from Curve 3.1.4 (75.00 – 99.99 EFPD) versus Curve 3.1.8 (175.00-199.99 EFPD). Examinee does NOT need to identify which graph was actually used. EXAMINER NOTE: “Exact” value for Minimum RCS Boron Concentration vs T-COLD is 1145 ppm. The smallest increment on this graph is 25 ppm. Applying an industry standard tolerance of +/- ½ the smallest increment would yield a tolerance of +/- 12.5 ppm, for an overall range for this step of 1132.5 to 1157.5 ppm. To allow for rounding, 1132.5 was rounded to 1132 and 1157.5 was rounded to 1158.	Examinee determines that the value entered on Line C.5 of Appendix C is not correct. Value should be between “ 1132 and 1158 ”, versus 1335. (Error #1)
SAT / UNSAT Comments (required for UNSAT):			



SRO ADMIN JPM A6
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	STEP	CUE	STANDARD
2. *	Steps 6.1.6 and 6.1.7 Examinee reviews Shutdown Margin Calculation.		Examinee determines that for Line C.7, the most (-2375 pcm), versus the least (-2332 pcm), negative value for Xenon Reactivity was used. (Error #2)
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
3. *	Steps 6.1.8 and 6.1.9 Examinee reviews Shutdown Margin Calculation.	EXAMINER NOTE: “Interpolated” value for SDM Boron Worth vs T-COLD (from Table 4.3.2) is -7.78 pcm/ppm. Using Curve 4.3.2: The smallest increment on this graph is 0.1 pcm/ppm. Applying an industry standard tolerance of +/- ½ the smallest increment would yield a tolerance of +/- 0.05 ppm. Applying this tolerance to the “interpolated” value from Table 4.3.2 yields an overall range for this step of “-7.73 to -7.83” pcm/ppm. To allow for rounding, -7.73 was rounded to -7.7 and -7.83 was rounded to -7.9.	Examinee determines that for Line C.9, the Boron Worth is between “-7.7 & -7.9.”
SAT / UNSAT Comments (required for UNSAT):			



SRO ADMIN JPM A6
PVNGS JOB PERFORMANCE MEASURE
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	STEP	CUE	STANDARD
4. *	Step 6.1.10 Examinee reviews Shutdown Margin Calculation.	EXAMINER NOTE: Tolerance for Line C.9 determined by dividing -2332 by -7.7 and -7.9. This yields 295.19 – 302.86. To allow for rounding, 295.16 was rounded to 295 and 302.86 was rounded to 303.	Examinee determines that for Line C.9, a math error occurred. The quotient should be “305” versus 30.5. (Error #3) Examinee enters “295-303” on Line C.9.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
5. *	Step 6.1.11 Examinee reviews Shutdown Margin Calculation.	EXAMINER NOTE: Tolerance for Line C.10 determined by subtracting the smallest value in Line C.9 (295) from the largest value in Line C.5 (1158), which yields 863. Next, the largest value in Line C.9 was subtracted from the smallest value in Line C.5 (1132), which yields 829.	Examinee enters “829-863” on Line C.10.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
6. *	Step 6.1.16 Examinee reviews Shutdown Margin Calculation.	EXAMINER NOTE: Examinee may point out that, since the operator used the XeRho V2 Code instead of the Simulate-3 Code for Xenon reactivity, then the second bullet in Step 6.1.6 should have been initialed and the first bullet should have been "N/A'd." This is NOT critical and not required for this evaluation.	Examinee determines that the result incorrectly shows that Current RCS Boron Concentration (line C.2) is less than the Xenon Adjusted Required Boron Concentration (Line C.10) and that the crew is required to GO TO Section 8.0, Contingencies. Correct result is that Line C.2 is greater than Line C.10 and Step 6.17 applies with Acceptance Criteria Met. (Error #4)
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NOTE:

*Issues identified on **E-Plan JPMs** during performance will be documented with a formal post-critique using Form EP-0800 and forwarded to the Emergency Preparedness organization for resolution.*

NORMAL TERMINATION POINT



SRO ADMIN JPM A6
PVNGS JOB PERFORMANCE MEASURE
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APPLICANT

INITIAL CONDITIONS:

- You are the CRS in Unit 1.
- Unit 1 was manually tripped at **0700** today due to a feedwater problem.
- ALL Reactor Trip breakers opened on the trip.
- ALL Full Strength CEA inserted on the trip.
- The plant has been stabilized at **565°F**.
- Current boron concentration is **900 ppm** from the latest chemistry sample taken at **0815** today.
- The Unit is at **180 EFPD**.
- No cool down is planned.
- 72ST-9RX14, Shutdown Margin – Modes 3, 4, and 5 is complete.
 - This ST was completed for the next **24** hours.
 - The Shift Manager directed the crew to use **565°F** as the Most Conservative Tcold for the surveillance period.
 - Reactor Engineering has provided the following data for Xenon Worth:
 - From the XeRho V2 Code: **-2332 pcm**.
 - From SIMULATE-3: **-2375 pcm**

INITIATING CUE:

Your tasks are to:

1. Review the given shutdown margin calculation.
2. Identify any errors (non-clerical, non-typos)
3. Provide the correct information for the errors on the following page (the number of lines on the answer sheet is not indicative of the number of errors).

Interpolation between different graphs of the Core Data book is not required. Choose the graph(s) that is/are closest to the given conditions.

APPLICANT



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Step Number*:	Error:
* Identification of the step numbers is not critical	

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Shutdown Margin - Modes 3, 4, and 5

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Appendix C Page 1 of 1

Appendix C - All FSCEA's Fully Inserted - Data Collection

Line	Procedure Step	Description	Value
C.1	6.1.3	Most Conservative T _{Cold} for Surveillance Period	<u>565</u> °F
C.2	6.1.3	RCS Boron concentration from latest chemistry sample	<u>900</u> ppm
C.3	6.1.3	Date and Time of RCS Boron Sample	<u>(today) 10815</u>
C.4	6.1.3	Current Core Burnup	<u>180</u> EFPD
C.5	6.1.4.2	Xenon Free Required RCS Boron Concentration RTCBs -Open (TS 3.1.1)	<u>1132-1158</u> ppm
C.6	6.1.5.2	Xenon Free Required RCS Boron Concentration RTCBs-Closed (TS 3.1.2)	<u>N/A</u> ppm
C.7	6.1.7	Xenon Reactivity (Check One) <input checked="" type="checkbox"/> Xerho V2 Value provided by reactor engineering using SIMULATE-3	<u>-2332</u> pcm
C.8	6.1.9	Boron Worth	<u>7.7-7.9 (-)</u> pcm/ppm

Calculated Xenon Adjustment Term

$$\text{Line C.7: } (-) \underline{2332} \text{ pcm} / \text{Line C.8: } (-) \underline{7.7(-)-7.9} \text{ pcm/ppm} = \text{Line C.9: } \underline{295-303} \text{ ppm}$$

C.9	Calculated Value	Xenon Adjustment Term	<u>295-303</u> ppm
-----	------------------	-----------------------	--------------------

Xenon Adjusted Required Boron Concentration

$$\begin{array}{l} \text{Line C.5 or C.6: } \frac{(1158)}{1132-1158} \text{ ppm} - \text{Line C.9: } \frac{(295)}{295-303} \text{ ppm} = \text{Line C.10: } \frac{(863)}{829-863} \text{ ppm} \\ \text{Line C.5 or C.6: } \frac{(1132)}{1132-1158} \text{ ppm} - \text{Line C.9: } \frac{(303)}{295-303} \text{ ppm} = \text{Line C.10: } \frac{(829)}{829-863} \text{ ppm} \end{array}$$

C.10	Calculated Value	Xenon Adjusted Required RCS Boron Concentration	<u>829-863</u> ppm
------	------------------	---	--------------------

End of Appendix C

Shutdown Margin - Modes 3, 4, and 5

72ST-9RX14

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17**5.0 PREREQUISITES AND INITIAL CONDITIONS****5.1 Prerequisites**

J 5.1.1 Personnel performing this procedure are qualified as ANY of the following:

- J* • Licensed SROs and ROs
- • STAs
- • Reactor Engineers qualified per RX ENG - UNIT OPERATIONS SUPPORT (ESP05-xx-014)

5.2 Initial Conditions

J 5.2.1 This procedure has been verified current by checking SWMS-DMX or eProc.

Date XX/XX/XXXX Time XX:XX

J 5.2.2 The Unit and current Mode has been selected in the following table:

Date:	<u>XX/XX/XXXX</u>			
Unit (Circle):	<u>1</u>	2	3	
Current Mode (Circle):	<u>3</u>	4	5	6

J 5.2.3 Section 2.0, Responsibilities has been read and understood by all test personnel.

J 5.2.4 Section 3.0, Precautions and Limitations has been read and understood by all test personnel.

J 5.2.5 The SM/CRS has reviewed the affected Technical Specification(s) or Technical Requirements Manual.

J 5.2.6 A pre-job brief has been performed.

Shutdown Margin - Modes 3, 4, and 5

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J 5.2.7 ONE of the following sections has been selected for performance:

- J* • Section 6.1, All FSCEAs Fully Inserted
- ___ • Section 6.2, Any FSCEA Not Fully Inserted - RTCBs Open
- ___ • Section 6.3, Any FSCEA Not Fully Inserted - RTCBs Closed
- ___ • Section 6.4, Appendix J - RCS Boron Concentrations from 40OP-9ZZ23 "Outage GOP" or 40OP-9ZZ24 "SNOW Outage."
- ___ • Section 6.5, RCS Borated to COLR Refueling Boron Concentration.

J 5.2.8 Permission to perform this test has been granted by the SM/CRS.

End of Section 5.0

Shutdown Margin - Modes 3, 4, and 5

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17**6.0 INSTRUCTIONS****6.1 All FSCEAs Fully Inserted***J* 6.1.1 Check BOTH of the following Initial Conditions met:

- J* • All FSCEA's fully inserted
- J* • CEA movement will NOT be performed during the surveillance interval.

NOTE*J* Line numbers (in parentheses) within action steps are in reference to individual line items in Appendix C.*J* 6.1.2 Select the most conservative T_{Cold} for the surveillance period as follows:*J* 6.1.2.1 **IF** Reactor Coolant Pumps (RCP's) are in service or RCS natural circulation conditions exist,
THEN select the most conservative T_{Cold} from ONE of the following:

- N/A* • RCT115, RC COLD LEG 1B TEMP points from PMS or ERFDADS
- N/A* • RCT125, RC COLD LEG 2A TEMP points from PMS or ERFDADS
- J* • As directed by the SM/CRS

N/A 6.1.2.2 **IF** RCP's are secured and Shutdown Cooling is in service,
THEN select the most conservative T_{Cold} from ONE of the following:

- N/A* • SIA-TT-351Y, HX TO LOOPS on SIA-TR-351, Shutdown Cooling Train A
- N/A* • ERFDADS point SIT351Y, Shutdown Cooling Loop A
- N/A* • SIB-TT-352Y, HX TO LOOPS on SIB-TR-352, Shutdown Cooling Train B
- N/A* • ERFDADS point SIT352Y, Shutdown Cooling Loop B
- N/A* • As directed by the SM/CRS

Shutdown Margin - Modes 3, 4, and 5

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J 6.1.3 Record ALL of the following initial calculation data:

- J* • Most Conservative T_{Cold} for Surveillance Period (Line C.1).
- J* • RCS Boron concentration from latest chemistry sample (Line C.2)
- J* • Date and Time of RCS Boron Sample (Line C.3).
- J* • Current Core Burnup (Line C.4).

J 6.1.4 IF RTCBs are OPEN,
THEN perform the following:

J 6.1.4.1 Determine the Xenon Free Required RCS Boron Concentration from Core Data Book(CDB) Curves 3.1.X, using ALL of the following data:

- J* • Most conservative T_{Cold} (Line C.1).
- J* • Current core burnup (Line C.4).

J 6.1.4.2 Record the Xenon Free Required RCS Boron Concentration (Line C.5).

N/A 6.1.4.3 IF the RCS Boron concentration (Line C.2) is greater than or equal to the Required Boron Concentration (Line C.5),
THEN GO TO Step 6.1.17.

J 6.1.4.4 IF the RCS Boron concentration (Line C.2) is less than the Required Boron Concentration (Line C.5),
THEN GO TO Step 6.1.6 to verify SDM with credit for Xenon.

N/A 6.1.5 IF RTCBs are CLOSED,
THEN perform the following:

N/A 6.1.5.1 Determine the Xenon Free Required RCS Boron Concentration from CDB Curves 3.2.X, using ALL of the following data:

- N/A* • Most conservative T_{Cold} (Line C.1).
- N/A* • Current core burnup (Line C.4).

N/A 6.1.5.2 Record the Xenon Free Required RCS Boron Concentration (Line C.6).

N/A 6.1.5.3 IF the RCS Boron concentration (Line C.2) is greater than or equal to the Xenon Free Required Boron Concentration (Line C.6),
THEN GO TO Step 6.1.18.

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N/A 6.1.5.4 IF the RCS Boron concentration (Line C.2) is less than the Xenon Free Required Boron Concentration (Line C.6),
THEN GO TO Step 6.1.6 to verify SDM with credit for Xenon.

J 6.1.6 Determine the minimum (least negative) expected Xenon reactivity from ONE of the following sources:

N/A • XeRho V2 Code (considering the time period for which the SDM calculation will be valid).

J • Reactor Engineering (using the SIMULATE-3 Code).

N/A • Other Reactor Engineering source as documented in the Surveillance Test Log.

J 6.1.7 Record Xenon reactivity (Line C.7).

J 6.1.8 Determine Boron Worth from CDB Curve 4.3.X using ALL of the following:

J • Most conservative T_{Cold} (Line C.1)

J • RCS Boron Concentration (Line C.2)

J • Current Core Burnup (Line C.4)

J 6.1.9 Record Boron Worth (Line C.8).

J 6.1.10 Divide Xenon Reactivity (Line C.7) by the Boron Worth (Line C.8) to obtain a Xenon Reactivity Adjustment Term (Line C.9).

J 6.1.11 Subtract the Xenon Adjustment Term (Line C.9) from the Required Boron Concentration (Line C.5) (RTCBs Open) **OR** (Line C.6) (RTCBs-Closed) to obtain a Xenon Adjusted Required Boron Concentration (Line C.10).

J 6.1.12 Record the Xenon Adjusted Required RCS Boron Concentration (Line C.10).

J 6.1.13 Sign for performing the SDM calculation.

Signature

Performer

Date

xx/xx/xxxx

M 6.1.14 Perform an Independent Verification the SDM calculation is correct

Signature

Independent Verifier

Date

xx/xx/xxxx

①

Shutdown Margin - Modes 3, 4, and 5

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N/A 6.1.15 IF the Current RCS Boron Concentration (Line C.2) is greater than or equal to the Xenon Adjusted Required Boron Concentration (Line C.10),
THEN perform the following:

N/A 6.1.15.1 IF RTCB's are OPEN,
THEN GO TO Step 6.1.17.

N/A 6.1.15.2 IF RTCB's are CLOSED,
THEN GO TO Step 6.1.18.

f 6.1.16 IF the Current RCS Boron Concentration (Line C.2) is less than the Xenon Adjusted Required Boron Concentration (Line C.10),
THEN GO TO Section 8.0, Contingencies.

— 6.1.17 IF RTCB's are OPEN,
THEN evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria - SR 3.1.1.1		
Current RCS Boron concentration (Line C.2) is greater than or equal to ONE of the following:		
<ul style="list-style-type: none"> Xenon Free Required RCS Boron Concentration (Line C.5) Xenon adjusted Required RCS Boron Concentration (Line C.10) 		
Acceptance Criteria Met?	(Circle Result)	YES / NO

— 6.1.18 IF RTCB's are CLOSED,
THEN evaluate the following SDM Technical Specification Acceptance Criteria:

Technical Specification Acceptance Criteria - SR 3.1.2.1		
Current RCS Boron concentration (Line C.2) is greater than or equal to ONE of the following:		
<ul style="list-style-type: none"> Xenon Free Required RCS Boron Concentration (Line C.6) Xenon adjusted Required RCS Boron Concentration (Line C.10) 		
Acceptance Criteria Met?	(Circle Result)	YES / NO

End of Section 6.1

Shutdown Margin - Modes 3, 4, and 5

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8.0 CONTINGENCIES

J 8.1 IF ANY Technical Specification Surveillance requirement is NOT satisfied, THEN perform the following:

J 8.1.1 Notify the SM/CRS that SDM requirements are NOT Satisfied.

J 8.1.2 Borate the RCS at greater than or equal to 26 gpm with a solution containing greater than 4000 ppm Boron or equivalent until the required SHUTDOWN MARGIN is restored.

J 8.1.3 Continue boration of the RCS until an RCS boron sample demonstrates the surveillance requirement is satisfied.

J 8.1.4 Notify Reactor Engineering as soon as possible.

J 8.1.5 Initiate a PVAR per 01DP-0AP12, Palo Verde Action Request Processing.

End of Section 8.0

9.0 REFERENCES

9.1 Implementing References

9.1.1 Core Data Book

9.1.2 Core Operating Limits Report

9.1.3 73DP-9ZZ14, Surveillance Testing

9.2 Developmental References

9.2.1 Developmental References are listed in the Basis Document.

End of Section 9.0

Shutdown Margin - Modes 3, 4, and 5

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Appendix C - All FSCEA's Fully Inserted - Data Collection

Line	Procedure Step	Description	Value
C.1	6.1.3	Most Conservative T_{Cold} for Surveillance Period	<u>565</u> °F
C.2	6.1.3	RCS Boron concentration from latest chemistry sample	<u>900</u> ppm
C.3	6.1.3	Date and Time of RCS Boron Sample	<u>xx/xx/xx 1005</u>
C.4	6.1.3	Current Core Burnup	<u>180</u> EFPD
C.5	6.1.4.2	Xenon Free Required RCS Boron Concentration RTCBs -Open (TS 3.1.1)	<u>1335</u> ppm
C.6	6.1.5.2	Xenon Free Required RCS Boron Concentration RTCBs- Closed (TS 3.1.2)	<u>N/A</u> ppm
C.7	6.1.7	Xenon Reactivity (Check One) — Xerho V2 Value provided by reactor engineering using SIMULATE-3	<u>-2375</u> pcm
C.8	6.1.9	Boron Worth	<u>2.78</u> (-) pcm/ppm

Calculated Xenon Adjustment Term

$$(-) \frac{2375 \text{ pcm}}{\text{Line C.7}} / (-) \frac{2.78 \text{ pcm/ppm}}{\text{Line C.8}} = \frac{30.5 \text{ ppm}}{\text{Line C.9}}$$

C.9	Calculated Value	Xenon Adjustment Term	<u>30.5</u> ppm
-----	------------------	-----------------------	-----------------

Xenon Adjusted Required Boron Concentration

$$\frac{1335 \text{ ppm}}{\text{Lines C.5 or C.6}} - \frac{30.5 \text{ ppm}}{\text{Line C.9}} = \frac{1304.5 \text{ ppm}}{\text{Line C.10}}$$

C.10	Calculated Value	Xenon Adjusted Required RCS Boron Concentration	<u>1304.5</u> ppm
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End of Appendix C



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JPM BASIS INFORMATION

TASK:	1280010202 Review Surveillance Tests						
TASK STANDARD:	Reviews 41ST-1ZZ02, identifies errors, and determines that Acceptance Criteria on Page 3 of 5 are NOT met.						
K/A:	2.2.12		K/A RATING:	RO:	3.7	SRO:	4.1
10 CFR 55:	45(b)(12)						
APPLICABLE POSITION(S):	SRO		VALIDATION TIME:	15 minutes			
REFERENCES:	41ST-1ZZ02, Inoperable Sources Action Statement, Revision 46						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR			PLANT		OTHER	X

JPM TYPE

Time Critical? (Yes/No) **No** Alternative Path? (Yes/No) **No**
PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Alan Malley Date: 05/25/2005

Revised By: Rusty Quick Date: 03/27/2015

Technical Review Operations Approval

Training Approval

(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: Date:

Evaluator Name:

Time to complete: Minutes GRADE (Circle One) SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR #

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Planning organization for resolution.



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1. SIMULATOR SETUP:

NA

2. SPECIAL TOOLS/EQUIPMENT:

- Completed copy of 41ST-1ZZ02 with errors.



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TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPMs ONLY

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do not enter contaminated, airborne, or high radiation areas.

ALL JPMs

- You may use any source of information normally available.



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INITIAL CONDITIONS:

- Unit 1 is in mode 1 with Emergency Diesel Generator ‘A’ inoperable due to a broken fuel line.
- 41ST-1ZZ02, Inoperable Power Sources Action Statement, Appendix B, has been completed.
- The Refueling Group is moving fuel in the fuel building.
- The rest of the electric plant is in a normal 100% full power lineup.
- No switchyard maintenance is in progress.

INITIATING CUE:

- As the CRS, your task is to review a completed 41ST-1ZZ02, Inoperable Power Sources Action Statement: Appendix B, One Diesel Generator Inoperable.
- Use the area below to document all errors and answer the two questions
- Page 1 of Appendix B has been verified to be correct by a second RO. This page accurately reflects the current electric plant lineup.

Record your answers in the area provided below:

Errors (the number of lines is NOT indicative of the number of errors):

- Are all Acceptance Criteria met (Page 3 of 5)? YES/NO
- Are all required redundant features operable (Page 4 of 5)? YES/NO



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INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) following a JPM Step number denotes a Critical Step.
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.



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JPM START TIME:

	STEP	CUE	STANDARD
1.	Evaluate Appendix B, Step 1.2.		Examinee evaluates Page 2 of 5 of Appendix B (Steps 1.2): Examinee notes that Step 1.2 is correct.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
2. *	Evaluate Appendix B, Step 1.3.		Examinee evaluates Page 2 of 5 of Appendix B (Steps 1.3): Examinee notes that Step 1.3 should be “6” vs “7.” (ERROR #1)
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
3. *	Evaluate Appendix B, step 1.4.		<p>Examinee evaluates page 3 of 5 of Appendix B (Step 1.4):</p> <p>Examinee notes that the Alternate supply breakers PBA-S03K and PBB-S04L are NOT both open according to Page 1 of 5.</p> <p>(ERROR #2)</p>
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
4. *	Are all Acceptance Criteria met (Page 3 of 5)?		Examinee evaluates Page 3 of 5 of Appendix B and determines that the Acceptance Criteria are NOT met.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
5.	Are all required redundant features operable (Page 4 of 5)?		Examinee evaluates Page 4 of 5 of Appendix B and determines that all required redundant features ARE operable.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



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APPLICANT

INITIAL CONDITIONS:

- Unit 1 is in mode 1 with Emergency Diesel Generator 'A' inoperable due to a broken fuel line.
- 41ST-1ZZ02, Inoperable Power Sources Action Statement, Appendix B, has been completed.
- The Refueling Group is moving fuel in the fuel building.
- The rest of the electric plant is in a normal 100% full power lineup.
- No switchyard maintenance is in progress.

INITIATING CUE:

- As the CRS, your task is to review a completed 41ST-1ZZ02, Inoperable Power Sources Action Statement: Appendix B, One Diesel Generator Inoperable.
- Use the area below to document all errors and answer the two questions
- Page 1 of Appendix B has been verified to be correct by a second RO. This page accurately reflects the current electric plant lineup.

Record your answers in the area provided below:

Errors (The number of lines is NOT indicative of the number of errors):

Are all Acceptance Criteria met (Page 3 of 5)? YES/NO

Are all required redundant features operable (Page 4 of 5)? YES/NO

APPLICANT



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A7 KEY

Record your answers in the area provided below:

Errors:

- Step 1.3 should be “6” vs “7.” **(ERROR #1)**
- The Alternate supply breakers PBA-S03K and PBB-S04L are **NOT** both open according to Page 1 of 5. **(ERROR #2)**

Are all Acceptance Criteria met (Page 3 of 5)?

YES/NO

Are all required redundant features operable (Page 4 of 5)?

YES/NO

A7 KEY

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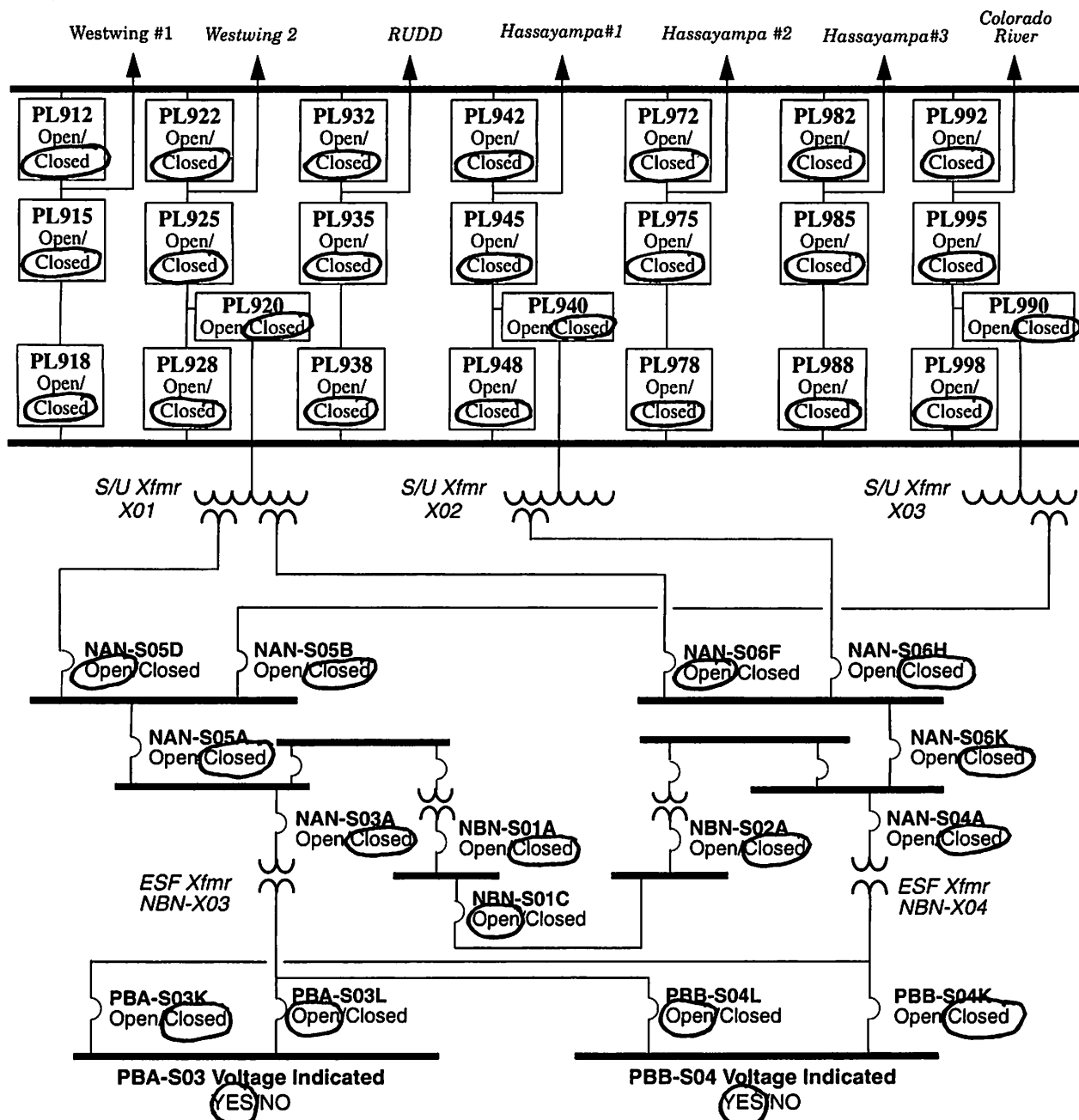
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Appendix B Page 1 of 5

Appendix B - One Diesel Generator Inoperable (L.C.O. 3.8.1, Action B)

Within 1 hour and once per 8 hours thereafter, complete steps 1.1 through 1.4 to check that two offsite power sources are operable:

- 1.1 Record all breaker/disconnect positions and voltage checks described below by circling the appropriate response:



2015 NRC SRO A7 - KEY

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- 1.2 Request from ECC whether the following transmission lines are closed in and capable of power transmission. Initial the applicable box.

Transmission Lines to the PVNGS 525 kV switchyard: Initial the applicable box(s) for the transmission lines closed in and capable of power transmission in **BOTH** columns.

Transmission Lines to the PVNGS 525 kV switchyard	YES	NO	Transmission Lines to the PVNGS 525 kV switchyard	YES	NO
Westwing #1 Line	<u>Bo</u>		Westwing #1 Line	<u>Bo</u>	
Westwing #2 Line	<u>Bo</u>		Westwing #2 Line	<u>Bo</u>	
RUDD Line	<u>Bo</u>		RUDD Line	<u>Bo</u>	
Colorado River Line	<u>Bo</u>		Colorado River Line	<u>Bo</u>	
Transmission Lines to the Hassayampa 525 kV switchyard	YES	NO	Hassayampa-Palo Verde #1 Line	<u>Bo</u>	
Kyrene/Jojoba/Hassayampa Line	<u>Bo</u>		Hassayampa-Palo Verde #2 Line	<u>Bo</u>	
Hoodoo Wash/Hassayampa Line	<u>Bo</u>		Hassayampa-Palo Verde #3 Line	<u>Bo</u>	
Total number of "YES" boxes initialed in this group.	<u>6</u>		Total number of "YES" boxes initialed in this group.	<u>7</u>	

- 1.3 Enter the **LOWEST** of the two totals from the previous step in the box at right. This is the number of credited transmission lines from offsite that are closed in and capable of supplying power "to" the PVNGS 525 kV Switchyard.

7

Error #1
Should be "6"

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1.4 Check that ALL of the following acceptance criteria are met:

ACCEPTANCE CRITERIA	L.C.O.	CIRCLE	INITIAL
At least two transmission lines are connected to the PVNGS 525 kV Switchyard.	3.8.1	YES / NO	
The transmission lines (above) are closed in from offsite and are capable of supplying power "to" the PVNGS 525 kV Switchyard as confirmed by ECC.	3.8.1	YES / NO	
At least two startup transformer are connected to the switchyard and can be supplied from both of the required operable transmission lines (above).	3.8.1	YES / NO	
Breakers NAN-S05D and/or NAN-S06F is open to maintain separation between startup transformers.	3.8.1	YES / NO	
Each Class 1E 4.16 kV bus is energized and aligned to one of the startup transformers referred to above.	3.8.1	YES / NO	
Alternate supply breakers PBA-S03K and PBB-S04L are both open to maintain electrical separation between trains.	3.8.1	YES / NO	
At least one of the following breakers - NBN-S01A, NBN-S01C, or NBN-S02A - is open to maintain electrical separation between trains.	3.8.1	YES / NO	
All Acceptance Criteria Satisfied	<u> </u> Initial	<u>xx/xx/xxxx</u> Date	<u>xxxx</u> Time

Error #2
Should be "NO"

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2.0 Within 1 hour and once per 8 hours thereafter, evaluate required redundant features as follows:

2.1 Check the operability of the following systems or components that are powered from the redundant, operable train of AC power by reviewing the Unit Log, Open Log Items, TSCCR book, and by observing the SEIS. (To be performed by the CRS/SM):

Systems/Components	Redundant Train OPERABLE? (circle)
Charging Pumps - TLCO T3.1.1 Note - Charging Pump CHE-P01 may be considered the "redundant component" if its power is aligned to the redundant train. Only ONE charging pump is required to satisfy the OPERABLE requirement.	<input checked="" type="radio"/> YES / NO
Radiation Monitors RU-29 (Train A) or RU-30 (Train B) - LCO 3.3.9	<input checked="" type="radio"/> YES / NO
Radiation Monitors RU-31 (Train A) or RU-145 (Train B) - TLCO T3.3.108 and ODCM 2.1	<input checked="" type="radio"/> YES / NO / NA
Pressurizer Heaters - LCO 3.4.9 (Not required in Mode 4)	<input checked="" type="radio"/> YES / NO / NA
ECCS - LCO 3.5.3 or LCO 3.5.4 (as applicable)	<input checked="" type="radio"/> YES / NO
Containment Spray - LCO 3.6.6	<input checked="" type="radio"/> YES / NO
Ctmt Isol Valves NCA-UV-402 or NCB-UV-403 - LCO 3.6.3	<input checked="" type="radio"/> YES / NO
Ctmt Isol Valves WCA-UV-62 or WCB-UV-61 - LCO 3.6.3	<input checked="" type="radio"/> YES / NO
Auxiliary Feedwater Pumps (AFA-P01 or AFB-P01) and components - LCO 3.7.5	<input checked="" type="radio"/> YES / NO
Essential Cooling Water - LCO 3.7.7	<input checked="" type="radio"/> YES / NO
Essential Spray Pond - LCO 3.7.8	<input checked="" type="radio"/> YES / NO
Essential Chilled Water - LCO 3.7.10	<input checked="" type="radio"/> YES / NO
Control Room Essential Filtration - LCO 3.7.11	<input checked="" type="radio"/> YES / NO
Control Room Emergency Air Temperature Control - LCO 3.7.12	<input checked="" type="radio"/> YES / NO
ESF Pump Room Air Exhaust Cleanup - LCO 3.7.13	<input checked="" type="radio"/> YES / NO
Shutdown Cooling - TLCO T3.5.201 or LCO 3.4.6 (Not required in mode 4 if neither train of SDC is required to be OPERABLE)	<input checked="" type="radio"/> YES / NO / NA
Fuel Building Essential Ventilation - TLCO T3.9.104	<input checked="" type="radio"/> YES / NO
The required systems or components that are powered from the redundant, operable train of AC power are operable:	
SM/CRS Signature: <u>William J. Smith</u> Date: <u>xx/xx/xxxx</u> Time: <u>XXXX</u>	

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N/A

2.2 IF the redundant train is inoperable for any system or component checked, THEN within 4 hours from the time that both of the following conditions coexisted declare both trains of that particular system or component inoperable and enter the appropriate action statement.

- An inoperable EDG exists
- A required feature on the redundant train is inoperable

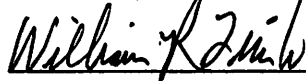
3.0 Within 24 hours from the time the diesel generator was discovered inoperable, the CRS/SM shall evaluate the remaining operable diesel generator.

B

3.1 Inform the CRS/SM of the following:

Within 24 hours from the time the diesel generator was discovered inoperable, evaluate the remaining operable diesel generator by recording ONE of the following in the Unit log:

- Determined the operable EDG is not inoperable due to a common mode failure.
- Performed SR 3.8.1.2 for the operable Diesel Generator
- The Inoperable DG has been restored to OPERABLE status prior to completion of LCO actions 3.8.1 B.3.1 or B.3.2. and the plant corrective action program (*document PVAR number in Unit Log*) will continue to evaluate the common cause possibility.
(not subject to 24 hour time constraint)



CRS/SM Signature



Date

Time

B

3.2 Place entries on the CORA timer to ensure step 3.1 completion **prior to 24 hours** from the time the diesel generator was discovered inoperable.

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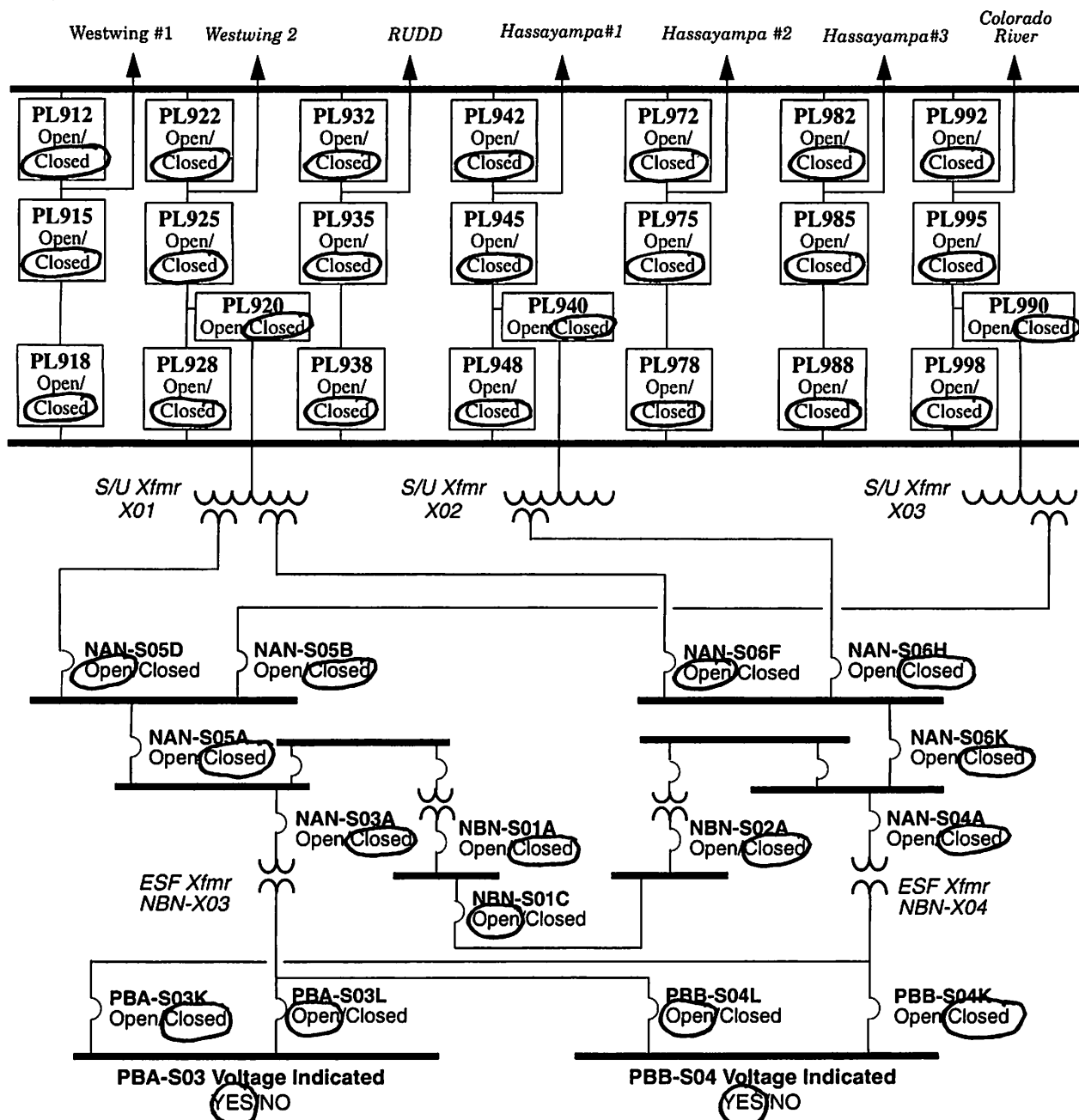
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Appendix B - One Diesel Generator Inoperable (L.C.O. 3.8.1, Action B)

Within 1 hour and once per 8 hours thereafter, complete steps 1.1 through 1.4 to check that two offsite power sources are operable:

- 1.1 Record all breaker/disconnect positions and voltage checks described below by circling the appropriate response:



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- 1.2 Request from ECC whether the following transmission lines are closed in and capable of power transmission. Initial the applicable box.

Transmission Lines to the PVNGS 525 kV switchyard: Initial the applicable box(s) for the transmission lines closed in and capable of power transmission in **BOTH** columns.

Transmission Lines to the PVNGS 525 kV switchyard	YES	NO	Transmission Lines to the PVNGS 525 kV switchyard	YES	NO
Westwing #1 Line	<u>Bo</u>		Westwing #1 Line	<u>Bo</u>	
Westwing #2 Line	<u>Bo</u>		Westwing #2 Line	<u>Bo</u>	
RUDD Line	<u>Bo</u>		RUDD Line	<u>Bo</u>	
Colorado River Line	<u>Bo</u>		Colorado River Line	<u>Bo</u>	
Transmission Lines to the Hassayampa 525 kV switchyard	YES	NO	Hassayampa-Palo Verde #1 Line	<u>Bo</u>	
Kyrene/Jojoba/Hassayampa Line	<u>Bo</u>		Hassayampa-Palo Verde #2 Line	<u>Bo</u>	
Hoodoo Wash/Hassayampa Line	<u>Bo</u>		Hassayampa-Palo Verde #3 Line	<u>Bo</u>	
Total number of "YES" boxes initialed in this group.	<u>6</u>		Total number of "YES" boxes initialed in this group.	<u>7</u>	

- 1.3 Enter the **LOWEST** of the two totals from the previous step in the box at right. This is the number of credited transmission lines from offsite that are closed in and capable of supplying power "to" the PVNGS 525 kV Switchyard.

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1.4 Check that **ALL** of the following acceptance criteria are met:

ACCEPTANCE CRITERIA	L.C.O.	CIRCLE	INITIAL
At least two transmission lines are connected to the PVNGS 525 kV Switchyard.	3.8.1	<u>YES</u> / NO	
The transmission lines (above) are closed in from offsite and are capable of supplying power "to" the PVNGS 525 kV Switchyard as confirmed by ECC.	3.8.1	<u>YES</u> / NO	
At least two startup transformer are connected to the switchyard and can be supplied from both of the required operable transmission lines (above).	3.8.1	<u>YES</u> / NO	
Breakers NAN-S05D and/or NAN-S06F is open to maintain separation between startup transformers.	3.8.1	<u>YES</u> / NO	
Each Class 1E 4.16 kV bus is energized and aligned to one of the startup transformers referred to above.	3.8.1	<u>YES</u> / NO	
Alternate supply breakers PBA-S03K and PBB-S04L are both open to maintain electrical separation between trains.	3.8.1	<u>YES</u> / NO	
At least one of the following breakers - NBN-S01A, NBN-S01C, or NBN-S02A - is open to maintain electrical separation between trains.	3.8.1	<u>YES</u> / NO	
All Acceptance Criteria Satisfied	<u>P</u> Initial	<u>xx/xx/xxxx</u> Date	<u>xxxx</u> Time

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2.0 Within 1 hour and once per 8 hours thereafter, evaluate required redundant features as follows:

2.1 Check the operability of the following systems or components that are powered from the redundant, operable train of AC power by reviewing the Unit Log, Open Log Items, TSCCR book, and by observing the SEIS. (To be performed by the CRS/SM):

Systems/Components	Redundant Train OPERABLE? (circle)
Charging Pumps - TLCO T3.1.1 <i>Note - Charging Pump CHE-P01 may be considered the "redundant component" if its power is aligned to the redundant train. Only ONE charging pump is required to satisfy the OPERABLE requirement.</i>	YES / NO
Radiation Monitors RU-29 (Train A) or RU-30 (Train B) - LCO 3.3.9	YES / NO
Radiation Monitors RU-31 (Train A) or RU-145 (Train B) - TLCO T3.3.108 and ODCM 2.1	YES / NO / NA
Pressurizer Heaters - LCO 3.4.9 (Not required in Mode 4)	YES / NO / NA
ECCS - LCO 3.5.3 or LCO 3.5.4 (as applicable)	YES / NO
Containment Spray - LCO 3.6.6	YES / NO
Ctmt Isol Valves NCA-UV-402 or NCB-UV-403 - LCO 3.6.3	YES / NO
Ctmt Isol Valves WCA-UV-62 or WCB-UV-61 - LCO 3.6.3	YES / NO
Auxiliary Feedwater Pumps (AFA-P01 or AFB-P01) and components - LCO 3.7.5	YES / NO
Essential Cooling Water - LCO 3.7.7	YES / NO
Essential Spray Pond - LCO 3.7.8	YES / NO
Essential Chilled Water - LCO 3.7.10	YES / NO
Control Room Essential Filtration - LCO 3.7.11	YES / NO
Control Room Emergency Air Temperature Control - LCO 3.7.12	YES / NO
ESF Pump Room Air Exhaust Cleanup - LCO 3.7.13	YES / NO
Shutdown Cooling - TLCO T3.5.201 or LCO 3.4.6 (Not required in mode 4 if neither train of SDC is required to be OPERABLE)	YES / NO / NA
Fuel Building Essential Ventilation - TLCO T3.9.104	YES / NO
The required systems or components that are powered from the redundant, operable train of AC power are operable:	
SM/CRS Signature: <u>William J. Smith</u> Date: <u>xx/xx/xxxx</u> Time: <u>XXXX</u>	

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N/A

2.2 **IF** the redundant train is inoperable for any system or component checked, **THEN** within 4 hours from the time that both of the following conditions coexisted declare both trains of that particular system or component inoperable and enter the appropriate action statement.

- An inoperable EDG exists
- A required feature on the redundant train is inoperable

3.0 Within 24 hours from the time the diesel generator was discovered inoperable, the CRS/SM shall evaluate the remaining operable diesel generator.

P

3.1 Inform the CRS/SM of the following:

Within 24 hours from the time the diesel generator was discovered inoperable, evaluate the remaining operable diesel generator by recording **ONE** of the following in the Unit log:

- Determined the operable EDG is not inoperable due to a common mode failure.
- Performed SR 3.8.1.2 for the operable Diesel Generator
- The Inoperable DG has been restored to OPERABLE status prior to completion of LCO actions 3.8.1 B.3.1 or B.3.2. and the plant corrective action program (*document PVAR number in Unit Log*) will continue to evaluate the common cause possibility.
(not subject to 24 hour time constraint)

William R. Smith

CRS/SM Signature

/ XX/XX/XXXX XXXX
Date Time

P

3.2 Place entries on the CORA timer to ensure step 3.1 completion **prior to 24 hours** from the time the diesel generator was discovered inoperable.



SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

JPM BASIS INFORMATION

TASK:	1290020301, Conduct On Shift Operations IAW Conduct of Shift Operations						
TASK STANDARD:	Upon completion of the JPM, the examinee will have determined the required hold points that will be exceeded, the required approval needed to exceed the hold points, and which AO will perform the task.						
K/A:	2.3.4		K/A RATING:	RO:	3.2	SRO:	3.7
10 CFR 55:	45(a)(12)						
APPLICABLE POSITION(S):	SRO		VALIDATION TIME:	20 minutes			
REFERENCES:	75DP-9RP01, Radiation Exposure and Access Control						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR			PLANT		OTHER	X

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **No**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Larry Burton Date: 10/11/2011

Revised By: Rusty Quick Date: 04/15/2015

Technical Review _____ Operations Approval _____

Training Approval _____

(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *



**SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

1. SPECIAL TOOLS/EQUIPMENT:

1. 75DP-9RP01 This JPM was written using Revision 20 of 75DP-9RP01. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.
2. Calculator
3. Pen and Paper



**SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.



**SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- You are the Outage SRO. You will be assigning a job to one AO from a work pool of three (listed below).
- The job is to depressurize and drain piping in Containment.
- RP surveys show the AO will be in a **300** mr/hr field. The job will take 1 hour.
- Evaluate the information about each AO below and answer the questions below.
- This is the 4th quarter of the year.

Exposure (in mrem)	S. Baugh Shift AO	J. Unitas FIN Operator	J. Montana RW Operator
Previous 4 years dose (2010-2014)	5275	8111	7655
1st Quarter (2015)	140	1516 Most exposure was from Spent resin operations	622
2nd Quarter (2015)	62	99	207
3rd Quarter (2015)	28	143	88
4th Quarter (to date)	1205 Most exposure was from RCP lineups at outage beginning	65	1072 Most exposure was from EDT sludge lancing support.

INITIATING CUE:

- Use the worksheet on the following page to document answers.
- List any hold point that may occur during this job (assuming each one performed the evolution).
- List whose approval (highest level of management) would be necessary for any hold points that would be exceeded. (Assume authorization for current dose levels have already been obtained.)
- Determine which one of the above AOs will perform the task; provide justification for your selection.



**SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) following a JPM Step number denotes a Critical Step.
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.



SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

JPM START TIME:

	STEP	CUE	STANDARD
1. *	Examinee determines total dose received for the job.		Examinee calculates that 300 mrem will be accumulated on this job.
SAT / UNSAT Comments (required for UNSAT):			



**SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
2. *	Examinee determines the hold points that will be exceeded for each operator.		<p>Examinee determines hold points exceeded are:</p> <p>S. Baugh – would exceed 1500 mrem for the calendar year.</p> <p>$(140 + 62 + 28 + 1205 + 300 = 1735 \text{ mrem})$</p> <p>J. Unitas – would exceed 10 Rem cumulative exposure in 5 years.</p> <p>$(8111 + 1516 + 99 + 143 + 65 + 300 = 10.234 \text{ Rem})$</p> <p>J. Montana – would exceed 2000 mrem for the calendar year.</p> <p>$(622 + 207 + 88 + 1072 + 300 = 2289 \text{ mrem})$</p>
SAT / UNSAT Comments (required for UNSAT):			



SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
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	STEP	CUE	STANDARD
3. *	Examinee determines whose approval required		Examinee determines the approval need for each operator is as follows: S. Baugh – RP Dept. Leader J. Unitas – Senior Vice President, Site Operations J. Montana – RP Manager
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
4. *	Examinee ascertains which Auxiliary Operator will perform the job based on ALARA criteria.		Examinee determines S. Baugh , Shift AO has the lowest year to date exposure based on ALARA, lowest dose.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT



**SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

ANSWER KEY

List any hold point that may occur during this job (assuming each one performed the evolution):

Baugh	<u>1500 mrem for the calendar year (Step 4.11.2.2(a))</u>
Unitas	<u>10 Rem in 5 years (Step 4.11.2.2(d))</u>
Montana	<u>2000 mrem for the calendar year (Step 4.11.2.2(b))</u>

List whose approval (highest level of management) would be necessary for any hold points that would be exceeded:

Baugh	<u>RP Department Leader (Step 4.11.2.2(a))</u>
Unitas	<u>Senior V.P., Site Operations (Step 4.11.2.2(d))</u>
Montana	<u>RP Manager (Step 4.11.2.2(b))</u>

- **Determine which one of the above AOs will perform the task; provide justification for your selection.**

AO to perform work S. Baugh - ALARA due to lowest dose year to date

ANSWER KEY



**SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

APPLICANT

INITIAL CONDITIONS:

- You are the Outage SRO. You will be assigning a job to one AO from a work pool of three (listed below).
- The job is to depressurize and drain piping in Containment.
- RP surveys show the AO will be in a 300 mr/hr field. The job will take 1 hour.
- Evaluate the information about each AO below and answer the questions below.
- This is the 4th quarter of the year.

Exposure (in mrem)	S. Baugh Shift AO	J. Unitas FIN Operator	J. Montana RW Operator
Previous 4 years dose (2010-2014)	5275	8111	7655
1 st Quarter (2015)	140	1516 Most exposure was from Spent resin operations	622
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3 rd Quarter (2015)	28	143	88
4 th Quarter (to date)	1205 Most exposure was from RCP lineups at outage beginning	65	1072 Most exposure was from EDT sludge lancing support.

INITIATING CUE:

- Use the worksheet on the following page to document answers.
- List any hold point that may occur during this job (assuming each one performed the evolution).
- List whose approval (highest level of management) would be necessary for any hold points that would be exceeded. (Assume authorization for current dose levels have already been obtained.)
- Determine which one of the above AOs will perform the task; provide justification for your selection.

APPLICANT



**SRO ADMIN JPM A8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

Applicant Worksheet

Exposure (in mrem)	S. Baugh Shift AO	J. Unitas FIN Operator	J. Montana RW Operator
Previous 4 years dose (2010-2014)	5275	8111	7655
1 st Quarter (2015)	140	1516 Most exposure was from Spent resin operations	622
2 nd Quarter (2015)	62	99	207
3 rd Quarter (2015)	28	143	88
4 th Quarter (to date)	1205 Most exposure was from RCP lineups at outage beginning	65	1072 Most exposure was from EDT sludge lancing support.

List any hold point that may occur during this job (assuming each one performed the evolution):

S. Baugh

J. Unitas

J. Montana

List whose approval would be necessary for any hold points that would be exceeded:

S. Baugh

J. Unitas

J. Montana

Determine which one of the above AOs will perform the task; provide justification for your selection.

AO to perform work



**SRO ADMIN JPM A9
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

JPM INFORMATION

TASK:	1240100202 Classify events requiring emergency plan implementation						
TASK STANDARD:	Emergency Action Level (EAL) is identified as a Site Area Emergency within 15 minutes, and Emergency Exposure Limit are determined.						
K/A:	2.4.41	RATING:	RO:	2.9	SRO:	4.6	
10 CFR 55:	45(a)(11)						
POSITION(S):	SRO	VALIDATION TIME:	20 Minutes				
REFERENCES:	EP-0901, Classifications; EP-0905, Protective Actions; Hot EAL Chart						
LOCATION:	SIMULATOR			PLANT		OTHER	X

JPM TYPE

TIME CRITICAL: YES ALTERNATE PATH: NO
PRA/SRA RELATED: NO

APPROVALS

DEVELOPED BY: Larry Burton DATE: 10/11/2011

REVISED BY: Rusty Quick DATE: 04/15/2015

Tech Review: _____ Operations Approval: _____

Training Approval: _____

EVALUATION

EXAMINEE: _____ DATE: _____

EVALUATOR: _____

TIME TO COMPLETE: _____ minutes GRADE (circle): SAT / UNSAT*



**SRO ADMIN JPM A9
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

1. SIMULATOR SETUP:

N/A

2. PROCEDURES/MATERIALS:

- The following must be available:
 - EP-0901, Classifications, Revision 9
 - EP-0905, Protective Actions, Revision 6
 - Hot EAL Chart, Revision G
- This JPM may be used with later revisions if it is verified that the later revision does not affect the Steps/Standards of the JPM.
- Pen/pencil and paper
- Marker

3. DRIVER INSTRUCTIONS DURING JPM:

N/A



**SRO ADMIN JPM A9
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INFORMATION PRESENTED TO EXAMINEE:

IN-PLANT JPMS ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY**. **DO NOT** operate any equipment.
- Inform the Control Room staff of any discovered deficiencies
- Comply with the REP. If it is not possible to enter an area it may be permissible to discuss the equipment and operation with evaluator. **DO NOT** enter Contaminated Areas or High Radiation Areas.

ALL JPMS:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



**SRO ADMIN JPM A9
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- You are in Unit 1.
- A SGTR has occurred.
- A SIAS actuated.
- The crew tripped the reactor.
- On the reactor trip a Loss of Power to the grid occurred.
- DG 'A' did not automatically start.
- HPSI pump 'B' has a white SEIS light illuminated.
- The CRS entered the Functional Recovery Procedure.
- The crew has restored power to PBA-S03, by crosstieing the 'B' DG to PBA-S03, and has started the 'A' HPSI pump.
- RVLMS indicated <21% in the outlet plenum 10 minutes ago, but now indicates >21%.
- The secondary operator has stabilized the secondary plant using AF 'A' and the ADVs.
- A team is being organized to conduct a search and rescue for a severely injured person.

INITIATING CUES:

- Your task is to determine the following:
 1. Classification Level and applicable EAL (inform the proctor by raising your hand when classification is completed)
 2. What would be the maximum allowable dose (Emergency Exposure Limit (TEDE)) for members of the search and rescue team (non-volunteer)?
- Provide your answers below.
- **THIS IS A TIME CRITICAL JPM.**



**SRO ADMIN JPM A9
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



**SRO ADMIN JPM A9
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

JPM START TIME:

	PROCEDURE STEP	CUE	STANDARD
1. *	Examinee reviews EAL chart and basis in Appendix A of EP-0901 to determine classification level.	EXAMINER CUE: After applicant makes the declaration, provide second applicant handout.	Examinee determines the classification is a Site Area Emergency based on EAL FS1. Time starts when examinee is given Initiating Cue: _____ Time stops when examinee determines classification: _____ Time start to classification < 15 minutes.
SAT / UNSAT Comments (required for UNSAT):			



SRO ADMIN JPM A9
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2015 NRC Exam

	PROCEDURE STEP	CUE	STANDARD
2. *	Examinee determines Emergency Exposure Limit for Life-Saving (non-volunteer) per Section 5.7 of EP-0905.		Examinee determines Emergency Exposure Limit for life-saving is LESS THAN OR EQUAL TO 25 REM per event.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NOTE:

*Issues identified on **E-Plan JPMs** during performance will be documented with a formal post-critique using Form EP-0800 and forwarded to the Emergency Preparedness organization for resolution.*

NORMAL TERMINATION POINT



**SRO ADMIN JPM A9
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

ANSWER KEY

Classification and EAL: **Site Area Emergency (FS1)**

Emergency Exposure Limit: **≤ 25 REM**

ANSWER KEY



**SRO ADMIN JPM A9
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

APPLICANT

INITIAL CONDITIONS:

- You are in Unit 1.
- A SGTR has occurred.
- A SIAS actuated.
- The crew tripped the reactor.
- On the reactor trip a Loss of Power to the grid occurred.
- DG 'A' did not automatically start.
- HPSI pump 'B' has a white SEIS light illuminated.
- The CRS entered the Functional Recovery Procedure.
- The crew has restored power to PBA-S03, by crosstieing the 'B' DG to PBA-S03, and has started the 'A' HPSI pump.
- RVLMS indicated <21% in the outlet plenum 10 minutes ago, but now indicates >21%.
- The secondary operator has stabilized the secondary plant using AF 'A' and the ADVs.
- A team is being organized to conduct a search and rescue for a severely injured person.

INITIATING CUE:

- **Your task is to determine the following:**
 1. **Classification Level and applicable EAL (inform the proctor by raising your hand when classification is completed)**
 2. **What would be the maximum allowable dose (Emergency Exposure Limit (TEDE)) for members of the search and rescue team (non-volunteer)?**
- **Provide your answers below.**

THIS IS A TIME CRITICAL JPM.

Classification and

EAL:

Emergency

Exposure Limit:

APPLICANT

Facility: **PVNGS**
Exam Level: **RO**

Date of Examination: **4/13/2015**
Operating Test No.: **2015NRC**

Control Room Systems[@] (8 for **RO**; 7 for SRO-I; 2 or 3 for SRO-U)

JPM #	System/JPM Title	Type Code*	Safety Function
S1	CIAS Actuation/Verification (40EP-9EO03, Loss of Coolant Accident, Steps 13 & 14))	S N A L E N 3.5103 A3.01 3.9/4.2	5
S2	Perform BDAS Alarm Check (40EP-9EO10, Standard Appendix 8)	S L D 3.7 015 A3.03 3.9/3.9	7
S3	Reenergize NBN-X02 (Non ESF Transformer) and NBN-S02(Non-classs 4160v bus) (40OP-9NB01, 4.16 Non-Class 1E Power (NB))	S N 3.6 062 A4.07 3.1/3.1	6
S4	Place Containment Refueling Purge Subsystem in Service (40OP-9CP01, Containment Purge System)	S N L 3.8 029 A2.032.7/3.1	8
S5	Respond to a Pressurizer Pressure Instrument Failure (40AL-9RK4A, Panel B04A Alarm Responses)	S M A 4.2 027 AA1.01 4.0/3.9	3
S6	Reset Inadvertent MSIS (40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations)	S D P 3.2 013 A4.01 4.5/4.8	2
S7	Reconnect and Reset the Steam Bypass Control System (40OP-9SF05, Operation of Steam Bypass Control System)	S D 3.4 041 A4.08 3.0/3.1	4S
S8	Withdraw Reg Group 4; and Trip the Reactor when Continuous CEA Movement Occurs (40AO-9ZZ09, Reactor Power Cutback (Loss of Feedpump))	S A D 4.2 001 AA2.05 4.4/4.6	1

In-Plant Systems[@] (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)

P1	Energize PBB-S04 from EDG 'B' (40AO-9ZZ19, Control Room Fire)	A D E 4.2 068 AA1.10 3.7/3.9	8
P2	Align Charging Pump Discharge to Hot Leg Injection Train A HPSI (40EP-9EO10, Standard Appendix 208, Attachment 208-A)	N E R 3.1004 A2.14 3.8/3.9	1
P3	Reset Overspeed Trip on AFA-P01 (40EP-9EO10, Standard Appendix 112)	A D E 3.4 061 A2.05 3.1/3.4	4S

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

*Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate Path	4-6 / 4-6 / 2-3
(C)ontrol Room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered Safety feature	- / - / ≥ 1 (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

JPM Summary:

S1, CIAS Actuation/Verification: This JPM will be conducted simultaneously with S2. After a LOCA a CIAS will fail to initiate. A CIAS is manually initiated and two sets of containment isolation valves fail to automatically close. The RO is directed to perform steps 13 and 14 from the LOCA procedure. After verifying a CIAS should have actuated, the RO manually initiates a CIAS. The next step is to ensure one isolation valve per containment penetration is closed. Two penetrations have both valves fail to close and the RO isolates at least one valve in each penetration. This is a NEW JPM. There are 3 critical steps in this JPM.

S2, BDAS Alarm Check: This JPM will be conducted simultaneously with S1. After an inadvertent Reactor Trip, an RCS leak develops and a CSAS is manually initiated on trend. The BOP is directed to perform Appendix 8, Boron Dilution Alarm Check, of the Standard Appendices. This is a Time Critical JPM because Boron Dilution Alarms must be confirmed operable within one hour after neutron flux is within the start-up range following a reactor shutdown. There are 11 critical steps in this JPM.

S3, Reenergize NBN-X02 (Non ESF Transformer and NBN-S02 (Non-Class 4160 v bus): This JPM will be conducted simultaneously with S4. The plant is in Mode 5 when the repairs to the 4160 bus NBN-S02 are completed. The RO is directed to restore power to NBN-X02 and NBN-S02 in accordance with 40OP-9NB01, 4.16 kV Non-Class 1E Power (NB), Section 6.6, Energizing 4.16 kV NBN-S02, beginning with Step 6.6.2.10. This is a NEW JPM. There are 3 critical steps in this JPM.

S4, Place Containment Refueling Purge Subsystem in Service: This JPM will be conducted simultaneously with S3. The plant is in Mode 5 when the BOP is directed to place the Containment Refueling Purge Subsystem in service in accordance with 40OP-9CP01, Containment Purge System, Section 7.0, Placing the Containment Refueling Purge Subsystem in Service with Power to CPA-2A/2B and CPB-3A/3B, beginning with Step 7.3.10. This is a NEW JPM. There are 3 critical steps in this JPM.

S5, Respond to a Pressurizer Pressure Instrument Failure: This JPM will be conducted simultaneously with S6. The plant is at power when and inadvertent MSIS occurs and PT-100X, Pressurizer Pressure Control Transmitter, fails LOW. HS-100, PPCS Selector Switch, fails in the "X" position (fails to transfer to the "Y" position). This results in an actual high pressure condition, as the heaters energize and the spray valves close. The RO is directed to respond to the alarms. The RO restores Pressurizer pressure in accordance with 40AL-9RK4A, Panel B04A Alarm Responses, window 4A01B, Group B. This is an Alternate Path JPM because the main spray valves will not open and the RO must initiate auxiliary spray to reduce RCS pressure. This is a modified JPM (from 2010 NRC Exam) because to the failure of the main spray valves. There are 3 critical steps in this JPM.

PVNGS License Examination
Control Room/In-Plant Systems Outline

S6, Reset Inadvertent MSIS: This JPM will be conducted simultaneously with S5. It was randomly selected from among the 2012 and 2013 NRC Exam systems and controls JPMs using a random generator on an Excel spreadsheet. The plant is at power when and inadvertent MSIS occurs and PT-100X, Pressurizer Pressure Control Transmitter, fails LOW. The BOP is directed to reset the inadvertent MSIS in accordance with 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations, Appendix B, PPS-ESFAS Reset. There are 5 critical steps in this JPM.

S7, Reconnect and Reset the Steam Bypass Control System: This JPM will be conducted simultaneously with S8. It is an "RO Only" JPM. The plant is at power with the Steam Bypass Control System (SBCS) in Manual. The BOP is directed to reconnect and reset the SBCS in accordance with 40OP-9SF05, Operation of Steam Bypass Control System, Appendix C, Connecting and Resetting Steam Bypass Control System. There are 5 critical steps in this JPM.

S8, Withdraw Reg Group 4; and Trip the Reactor when Continuous CEA Movement Occurs (40AO-9ZZ09, Reactor Power Cutback (Loss of Feedpump)): This JPM will be conducted simultaneously with S7. It is an "RO Only" JPM. The RO is directed to borate complete Steps 30 and 31 of 40AO-9ZZ09 to restore normal CEA group overlap.. This is an Alternate Path JPM because the continuous CEA movement requires the RO to implement an ARP and manually trip the Reactor. There are 4 critical steps in this JPM.

P1, Energize PBB-S04 with EDG 'B': The Area Operator is directed to perform the actions of Appendix E of 40AO-9ZZ19, Control Room Fire. This Appendix separates the controls for the 'B' DG and 4160 SWGR breakers from the control room and starts EDG 'B' to supply PBB-S04. This is an Alternate Path JPM in that the DG breaker will not close electrically and the operator must go the contingency step and manually close the breaker. This is a Time Critical JPM because the operator must close the DG breaker and start the Spray Pond pump to supply cooling to the DG within a 15 minute period. There are 13 critical steps in this JPM.

P2, Align Charging Pump Discharge to Hot Leg Injection: The Area Operator is directed to align charging pump discharge to Hot Loeg Injection Train A HPSI in accordance with 40EP-9EO10, Standard Appendix 208, Attachment 208-A. This is a NEW JPM. There are 3 critical steps in this JPM.

P3, Reset Overspeed Trip on AFA-P01: The Area Operator is directed to reset an overspeed trip on the Turbine Driven Auxiliary Feedwater Pump in accordance with 40EP-9EO10, Standard Appendix 112. This JPM is the 4th most significant Key Operator Action in the PVNGS PRA. This is an Alternate Path JPM because the Latch Lever and the Trip Hook are not aligned, requiring the Operator to reset AFA-HV-54 (T&TV) in accordance with Contingency Action 7.1. There are 6 critical steps in this JPM.

Facility: **PVNGS**
Exam Level: **SRO-I**

Date of Examination: **4/13/2015**
Operating Test No.: **2015 NRC**

Control Room Systems[@] (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

JPM #	System/JPM Title	Type Code*	Safety Function
S1	CIAS Actuation/Verification (40EP-9EO03, Loss of Coolant Accident, Steps 13 & 14))	S N A L E N 3.5 103 A3.01 3.9/4.2	5
S2	Perform BDAS Alarm Check (40EP-9EO10, Standard Appendix 8)	S L D 3.7 015 A3.03 3.9/3.9	7
S3	Reenergize NBN-X02 (Non ESF Transformer) and NBN-S02 (Non-classs 4160v bus) (40OP-9NB01, 4.16 Non-Class 1E Power (NB))	S N 3.6 062 A4.07 3.1/3.1	6
S4	Place Containment Refueling Purge Subsystem in Service (40OP-9CP01, Containment Purge System)	S N L 3.8 029 A2.03 2.7/3.1	8
S5	Respond to a Pressurizer Pressure Instrument Failure (40AL-9RK4A, Panel B04A Alarm Responses)	S M A 4.2 027 A1.01 4.0/3.9	3
S6	Reset Inadvertent MSIS (40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations)	S D P 3.2 013 A4.01 4.5/4.8	2
S9	Isolate a Ruptured SG (40EP-9EO10 Standard Appendix 114)	S D A L 3.4 035 A2.01 4.5/4.6	4P

In-Plant Systems[@] (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)

P1	Energize PBB-S04 from EDG 'B' (40AO-9ZZ19, Control Room Fire)	A D E 4.2 068 AA1.10 3.7/3.9	8
P2	Align Charging Pump Discharge to Hot Leg Injection Train A HPSI (40EP-9EO10, Standard Appendix 208, Attachment 208-A)	N E R 3.1 004 A2.14 3.8/3.9	1
P3	Reset Overspeed Trip on AFA-P01 (40EP-9EO10, Standard Appendix 112)	A D E 3.4 061 A2.05 3.1/3.4	4S

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

*Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate Path	4-6 / 4-6 / 2-3
(C)ontrol Room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered Safety feature	- / - / ≥ 1 (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

JPM Summary:

S1, CIAS Actuation/Verification: This JPM will be conducted simultaneously with S2. After a LOCA a CIAS will fail to initiate. A CIAS is manually initiated and two sets of containment isolation valves fail to automatically close. The RO is directed to perform steps 13 and 14 from the LOCA procedure. After verifying a CIAS should have actuated, the RO manually initiates a CIAS. The next step is to ensure one isolation valve per containment penetration is closed. Two penetrations have both valves fail to close and the RO isolates at least one valve in each penetration. This is a NEW JPM. There are 3 critical steps in this JPM.

S2, BDAS Alarm Check: This JPM will be conducted simultaneously with S1. After an inadvertent Reactor Trip, an RCS leak develops and a CSAS is manually initiated on trend. The BOP is directed to perform Appendix 8, Boron Dilution Alarm Check, of the Standard Appendices. This is a Time Critical JPM because Boron Dilution Alarms must be confirmed operable within one hour after neutron flux is within the start-up range following a reactor shutdown. There are 11 critical steps in this JPM.

S3, Reenergize NBN-X02 (Non ESF Transformer and NBN-S02 (Non-Class 4160 v bus): This JPM will be conducted simultaneously with S4. The plant is in Mode 5 when the repairs to the 4160 bus NBN-S02 are completed. The RO is directed to restore power to NBN-X02 and NBN-S02 in accordance with 40OP-9NB01, 4.16 kV Non-Class 1E Power (NB), Section 6.6, Energizing 4.16 kV NBN-S02, beginning with Step 6.6.2.10. This is a NEW JPM. There are 3 critical steps in this JPM.

S4, Place Containment Refueling Purge Subsystem in Service: This JPM will be conducted simultaneously with S3. The plant is in Mode 5 when the BOP is directed to place the Containment Refueling Purge Subsystem in service in accordance with 40OP-9CP01, Containment Purge System, Section 7.0, Placing the Containment Refueling Purge Subsystem in Service with Power to CPA-2A/2B and CPB-3A/3B, beginning with Step 7.3.10. This is a NEW JPM. There are 3 critical steps in this JPM.

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PVNGS License Examination
Control Room/In-Plant Systems Outline

S6, Reset Inadvertent MSIS: This JPM will be conducted simultaneously with S5. It was randomly selected from among the 2012 and 2013 NRC Exam systems and controls JPMs using a random generator on an Excel spreadsheet. The plant is at power when and inadvertent MSIS occurs and PT-100X, Pressurizer Pressure Control Transmitter, fails LOW. The BOP is directed to reset the inadvertent MSIS in accordance with 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations, Appendix B, PPS-ESFAS Reset. There are 5 critical steps in this JPM.

S9, Isolate a Rupted SG: This JPM is an “SRO Only” JPM. The RO is directed to isolate SG#2 due to a SG Tube Rupture. This is an Alternate Path JPM because the Downcomer Isolation valves will not close and the RO must perform the contingency to isolate other vavles. There are 4 critical steps in this JPM.

P1, Energize PBB-S04 with EDG ‘B’: The Area Operator is directed to perform the actions of Appendix E of 40AO-9ZZ19, Control Room Fire. This Appendix separates the controls for the ‘B’ DG and 4160 SWGR breakers from the control room and starts EDG ‘B’ to supply PBB-S04. This is an Alternate Path JPM in that the DG breaker will not close electrically and the operator must go the contingency step and manually close the breaker. This is a Time Critical JPM because the operator must close the DG breaker and start the Spray Pond pump to supply cooling to the DG within a 15 minute period. There are 13 critical steps in this JPM.

P2, Align Charging Pump Discharge to Hot Leg Injection: The Area Operator is directed to align charging pump discharge to Hot Loeg Injection Train A HPSI in accordance with 40EP-9EO10, Standard Appendix 208, Attachment 208-A. This is a NEW JPM. There are 3 critical steps in this JPM.

P3, Reset Overspeed Trip on AFA-P01: The Area Operator is directed to reset an overspeed trip on the Turbine Driven Auxiliary Feedwater Pump in accordance with 40EP-9EO10, Standard Appendix 112. This JPM is the 4th most significant Key Operator Action in the PVNGS PRA. This is an Alternate Path JPM because the Latch Lever and the Trip Hook are not aligned, requiring the Operator to reset AFA-HV-54 (T&TV) in accordance with Contingency Action7.1. There are 6 critical steps in this JPM.

Facility: **PVNGS**
Exam Level: **SRO-U**

Date of Examination: **4/13/2015**
Operating Test No.: **2015 NRC**

Control Room Systems[@] (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

JPM #	System/JPM Title	Type Code*	Safety Function
S1	CIAS Actuation/Verification (40EP-9EO03, Loss of Coolant Accident, Steps 13 & 14))	S N A L E N 3.5 103 A3.01 3.9/4.2	5
S2	Perform BDAS Alarm Check (40EP-9EO10, Standard Appendix 8)	S L D 3.7 015 A3.03 3.9/3.9	7
S9	Isolate a Ruptured SG (40EP-9EO10 Standard Appendix 114)	S D A L 3.2 006 A2.02 4.5/4.6	4P

In-Plant Systems[@] (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)

P1	Energize PBB-S04 from EDG 'B' (40AO-9ZZ19, Control Room Fire)	A D E 4.2 068 AA1.10 3.7/3.9	8
P2	Align Charging Pump Discharge to Hot Leg Injection Train A HPSI (40EP-9EO10, Standard Appendix 208, Attachment 208-A)	N E R 3.1 004 A2.14 3.8/3.9	1

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

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(C)ontrol Room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered Safety feature	- / - / ≥ 1 (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

JPM Summary:

S1, CIAS Actuation/Verification: This JPM will be conducted simultaneously with S2. After a LOCA a CIAS will fail to initiate. A CIAS is manually initiated and two sets of containment isolation valves fail to automatically close. The RO is directed to perform steps 13 and 14 from the LOCA procedure. After verifying a CIAS should have actuated, the RO manually initiates a CIAS. The next step is to ensure one isolation valve per containment penetration is closed. Two penetrations have both valves fail to close and the RO isolates at least one valve in each penetration. This is a NEW JPM. There are 3 critical steps in this JPM.

S2, BDAS Alarm Check: This JPM will be conducted simultaneously with S1. After an inadvertent Reactor Trip, an RCS leak develops and a CSAS is manually initiated on trend. The BOP is directed to perform Appendix 8, Boron Dilution Alarm Check, of the Standard Appendices. This is a Time Critical JPM because Boron Dilution Alarms must be confirmed operable within one hour after neutron flux is within the start-up range following a reactor shutdown. There are 11 critical steps in this JPM.

S9, Isolate a Rupted SG: This JPM is an “SRO Only” JPM. The RO is directed to isolate SG#2 due to a SG Tube Rupture. This is an Alternate Path JPM because the Downcomer Isolation valves will not close and the RO must perform the contingency to isolate other vavles. There are 4 critical steps in this JPM.

P1, Energize PBB-S04 with EDG ‘B’: The Area Operator is directed to perform the actions of Appendix E of 40AO-9ZZ19, Control Room Fire. This Appendix separates the controls for the ‘B’ DG and 4160 SWGR breakers from the control room and starts EDG ‘B’ to supply PBB-S04. This is an Alternate Path JPM in that the DG breaker will not close electrically and the operator must go the contingency step and manually close the breaker. This is a Time Critical JPM because the operator must close the DG breaker and start the Spray Pond pump to supply cooling to the DG within a 15 minute period. There are 13 critical steps in this JPM.

P2, Align Charging Pump Discharge to Hot Leg Injection: The Area Operator is directed to align charging pump discharge to Hot Loeg Injection Train A HPSI in accordance with 40EP-9EO10, Standard Appendix 208, Attachment 208-A. This is a NEW JPM. There are 3 critical steps in this JPM.



RO/SROI/SROU SIMULATOR JPM S1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

JPM BASIS INFORMATION

TASK:	1240040201 Implement LOCA instructions and contingencies							
TASK STANDARD:	CIAS has been actuated. At least one valve in each penetration has been closed.							
K/A:	3.5103 A3.01			K/A RATING:	RO:	3.9	SRO:	4.2
10 CFR 55:	45(a)(5)							
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	7 minutes				
REFERENCES:	40EP-9EO03, Loss of Coolant Accident							
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER			

JPM TYPE

Time Critical? (Yes/No) **No** Alternative Path? (Yes/No) **Yes**
PRA/SRA related? (Yes/No) **Yes**

APPROVAL

Developed By: Alan Malley Date: 08/05/2014

Revised By: Rusty Quick Date: 03/25/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



RO/SROI/SROU SIMULATOR JPM S1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

1. SIMULATOR SETUP:

- IC#: 600
- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

- SPECIAL INSTRUCTIONS:
 1. **IF** IC600 is used, reset to **IC 600**, GO TORUN, acknowledge alarms, **THEN** Go To Step 11
 2. **IF** IC 600 is **NOT** used, reset to IC 20, GO TORUN
 3. Run scenario file **2015 NRC S-1 and S-2.scn** from exam flash drive
 4. Trip the reactor
 5. Perform SPTAs
 6. Wait until LOG Power is $< 2 \times 10^{-6}\%$
 7. Insert malfunction mfTH01A f:2
 8. Perform 40EP-9EO03, LOCA Procedure, up through **Step 12**
 9. **DO NOT** manually insert a CIAS or MSIS (SIAS will be initiated per the LOCA procedure)
 10. Ensure containment pressure is > 3 psig
 11. GO TO**FREEZE**
 12. Provide**INITIATING CUE**
 13. GO TORUN
 14. **STAGGER start of JPMs S1 and S2. Allow S2 to complete actions on B04, then go to back panels before starting S1.**
- REQUIRED CONDITIONS:
 - LOCA in progress
 - Containment Pressure > 3 psig
 - No CIAS actuated
 - Log Power $< 2 \times 10^{-6}\%$
- SIMULATOR EVALUATION PRE-CHECK
 - ☐ Correct IC
 - ☐ Alarm Silence Off
 - ☐ Procedures available, page checked, and clean
 - ☐ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40EP-9EO03, Loss of Coolant Accident, Revision 32 available.



**RO/SROI/SROU SIMULATOR JPM S1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

NOTE: This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- MALFUNCTIONS, OVERRIDES, etc. **during** JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
NONE	NONE	NONE



**RO/SROI/SROU SIMULATOR JPM S1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DO NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



**RO/SROI/SROU SIMULATOR JPM S1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- A Loss of Coolant Accident has occurred. The Reactor has been tripped
- SPTAs have been performed
- 40EP-9EO03, Loss of Coolant Accident, has been entered and Steps 1-12 have been or are in the process of being completed

INITIATING CUE:

- The CRS directs you to perform Steps 13-14 of 40EP-9EO03, Loss of Coolant Accident



RO/SROI/SROU SIMULATOR JPM S1
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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



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JPM START TIME:

	STEP	CUE	STANDARD
1.	Step 13: IF containment pressure is 3 psig or more, THEN check CIAS is actuated.		Examinee reads containment pressure on B04 instrumentation and determines containment pressure is > 3 psig but CIAS is not actuated
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
2. *	Step 13.1: Manually actuate CIAS.		Examinee initiates a CIAS by turning at least two of the following handswitches on B04: <ul style="list-style-type: none">• CIAS ACTUATION SIA-HS-5• CIAS ACTUATION SIB-HS-6• CIAS ACTUATION SIC-HS-7• CIAS ACTUATION SID-HS-8 Examiner Note: After the examinee turns at least two of the handswitches the CIAS annunciator window on B04 will illuminate.
SAT / UNSAT Comments (required for UNSAT):			

**ALTERNATE
PATH**



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	STEP	CUE	STANDARD
3.	<p>Step 14:</p> <p>IF CIAS has actuated, THEN perform the following:</p> <p>a. Check that an isolation valve is closed for each containment penetration required to be closed.</p>		<p>Examinee determines from the Safety Equipment Status System (SESS) displays on B02 that two penetrations do NOT have at least one penetration closed. One is WC (Normal Chilled Water) from containment and the other is RD (Radioactive Drains) from containment.</p> <p>Examiner Note:</p> <p>The SESS panel on B02 will look like the pictures below for Containment Isolation after the alarms are acknowledged.</p>

SAT / UNSAT

Comments (required for UNSAT):

Train A SESS

SESS COMPONENT STATUS TRAIN A											
CONTAINMENT ISOLATION											
RDT OUTLET ISOL VLV UV-560	MU SPLY TO RDT ISOL VLV UV-580							ISOL VLV UV-1	ISOL VLV UV-203	EMERG JMPA ISOL VLV UV-708	LETDOWN PASS ISOL VLV UV-715
			NORM CHW RET ISOL VLV UV-62		N2 SPLY ISOL VLV UV-1	CNTMT PRG PWR ACC MODE ISOL VLV UV-4	CNTMT PRG RFLG MODE ISOL VLV UV-2A	PZR SURGE SMPL ISOL VLV UV-204			PASS CNTMT ISOL VLV UV-23/UV-24
	LETDOWN TO REGEN HX ISOL VLV UV-516				CNTMT ATM RAD MON ISOL VLV UV-45/UV-46	CNTMT PRG PWR ACC MODE ISOL VLV UV-4B	CNTMT PRG RFLG MODE ISOL VLV UV-2B	PZR STM SPACE SMPL ISOL VLV UV-205	CNTMT RW SUMPS ISOL VLV UV-23		

Blue lights lit for these four windows

Train B SESS

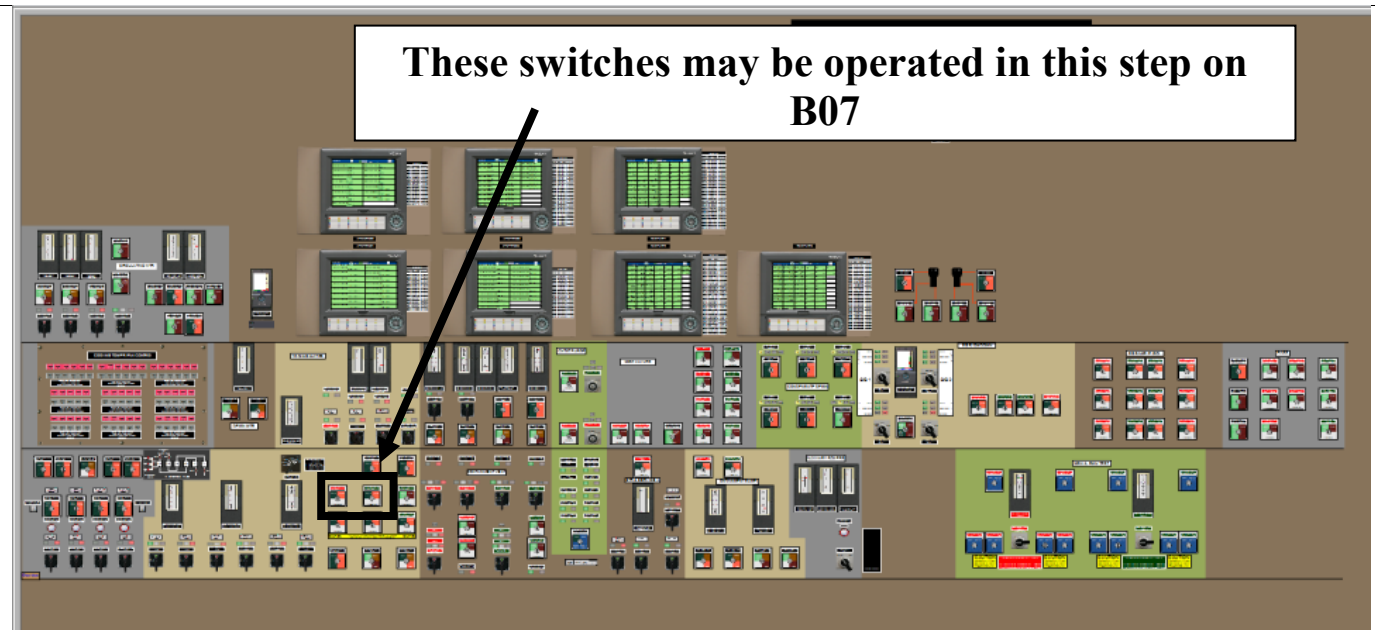
SESS COMPONENT STATUS TRAIN B											
CONTAINMENT ISOLATION											
RDT OUTLET ISOL VLV UV-561								RDT GAS SURGE HDR ISOL VLV UV-2	RC HOT LEG SMPL ISOL VLV UV-200		LETDOWN PASS ISOL VLV UV-924
	LETDOWN TO REGEN HX ISOL VLV UV-515	CHEM ADD TO SG 1/2 ISOL VLV HV-200/HV-201	NORM CHW RET ISOL VLV UV-61	NORM CHW SPLY ISOL VLV UV-63		CNTMT PRG PWR ACC MODE ISOL VLV UV-5A	CNTMT PRG RFLG MODE ISOL VLV UV-3A	PZR SURGE SMPL ISOL VLV UV-201	CNTMT RW SUMPS SMPL ISOL VLV UV-407		
	LETDOWN TO REGEN HX ISOL VLV UV-523				CNTMT ATM RAD MON ISOL VLV UV-44/UV-47	CNTMT PRG PWR ACC MODE ISOL VLV UV-5B	CNTMT PRG RFLG MODE ISOL VLV UV-3B	PZR STM SPACE SMPL ISOL VLV UV-202	CNTMT RW SUMPS ISOL VLV UV-24		



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	STEP	CUE	STANDARD
4. *	Step 14.a.1: Ensure that an isolation valve is closed for each containment penetration required to be closed.	<div style="text-align: center; border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> ALTERNATE PATH </div>	Examinee isolates the Normal Chilled Water Return penetration by closing WCA-UV-62 or WCB-UV-61 using one or both of the following handswitches on B07: <ul style="list-style-type: none"> WCA-HS-62 WCB-HS-61 <p>Examiner Note:</p> <p>Only one of the valves must be closed to meet the critical task.</p>

SAT / UNSAT
 Comments (required for UNSAT):



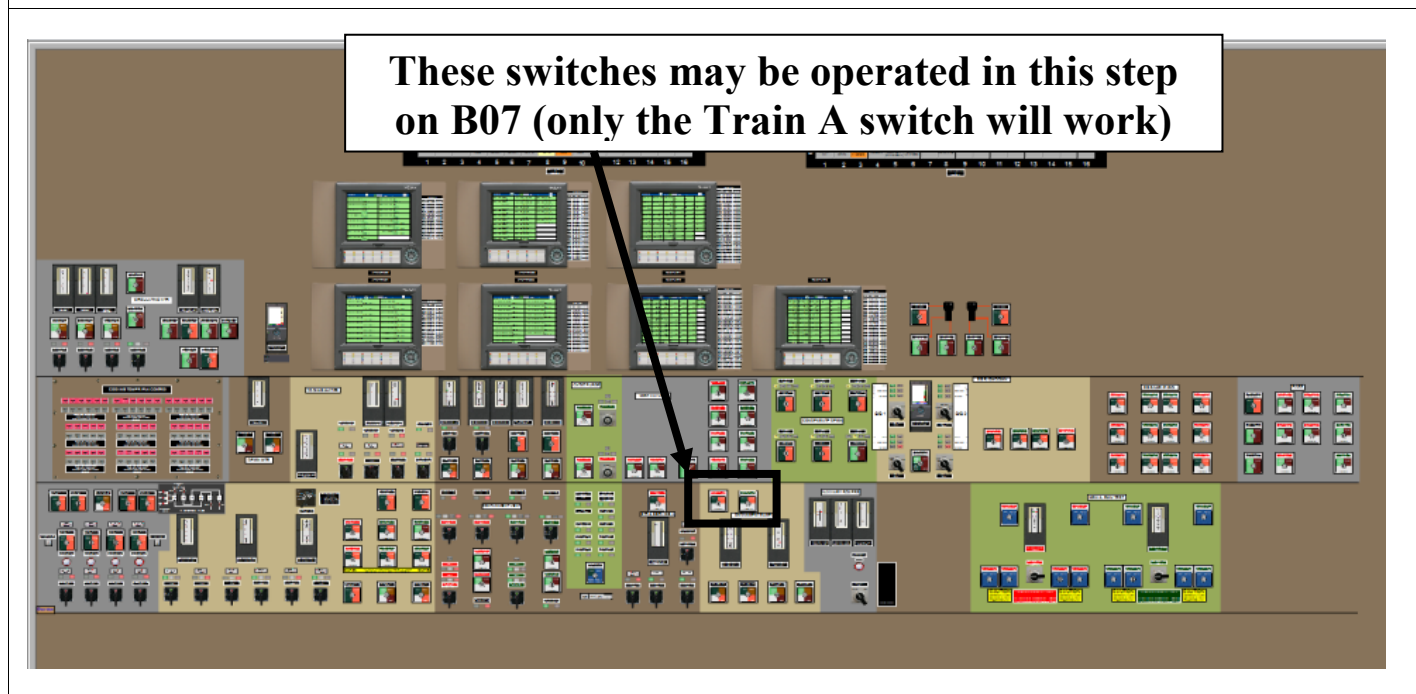


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	STEP	CUE	STANDARD
5. *	Step 14.a.1: Ensure that an isolation valve is closed for each containment penetration required to be closed.	<div style="border: 1px solid black; padding: 10px; display: inline-block;"> ALTERNATE PATH </div>	Examinee isolates the Radioactive Drain containment penetration by closing RDA-UV-23 using the following handswitch on B07: <ul style="list-style-type: none"> RDA-HS-23 Examiner Note: If the examinee attempts to close RDB-UV-24 it will not close.

SAT / UNSAT

Comments (required for UNSAT):



JPM STOP TIME:

NORMAL TERMINATION POINT



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APPLICANT

INITIAL CONDITIONS:

- A Loss of Coolant Accident has occurred
- The Reactor has been tripped
- SPTAs have been performed
- 40EP-9EO03, Loss of Coolant Accident, has been entered and Steps 1-12 have been or are in the process of being completed

INITIATING CUE:

- The CRS directs you to perform Steps 13-14 of 40EP-9EO03, Loss of Coolant Accident

APPLICANT

LOSS OF COOLANT ACCIDENT

INSTRUCTIONSCONTINGENCY ACTIONS

NOTE

Hydrogen Analyzers are required to be placed in service within 30 minutes of the LOCA.

12. Place the Hydrogen Analyzers in service.

* 13. **IF** containment pressure is 3 psig or more,
THEN check CIAS is actuated.

13.1 Manually actuate CIAS.

CAUTION

High radiation levels may result in personnel exposure when attempting local manual valve operation.

* 14. **IF** CIAS has actuated,
THEN perform the following:

a. Check that an isolation valve is closed for each containment penetration required to be closed.

a.1 Ensure that an isolation valve is closed for each containment penetration required to be closed.



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JPM BASIS INFORMATION

TASK:	0150030801 Perform a BDAS Alarm check (Appendix 8)						
TASK STANDARD:	BDAS Alarm Check (Appendix 8) completed to determine SU Channels and BDAS are operable within 1 hour of entering the Start-up Range.						
K/A:	3.7015A3.03		K/A RATING:	RO:	3.9	SRO:	3.9
10 CFR 55:	45(a)(5)						
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	20 minutes			
REFERENCES:	40EP-9EO10, Standard Appendices, Appendix 8, Revision 82						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? (Yes/No) **Yes**

Alternative Path? (Yes/No) **No**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Jim Shannon Date: 06/06/2005

Revised By: Rusty Quick Date: 03/26/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



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1. SIMULATOR SETUP:

- IC#: 600
- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

- SPECIAL INSTRUCTIONS:
 1. IF IC 600 is used, reset to IC 600 , GO TORUN, acknowledge alarms, THENGO TO Step 11
 2. IF IC 600 is NOT used, reset to IC 20, GO TO RUN
 3. Run scenario file 2015 NRC S-1 and S-2.scn from exam flash drive
 4. Trip the reactor
 5. Perform SPTAs
 6. Wait until LOG Power is $< 2 \times 10^{-6} \%$
 7. Insert malfunction mfTH01A f:2
 8. Perform 40EP-9EO03, LOCA Procedure, up through Step 12
 9. DO NOT manually insert a CIAS or MSIS (SIAS will be initiated per the LOCA procedure)
 10. Ensure containment pressure is > 3 psig
 11. GO TO FREEZE
 12. Provide INITIATING CUE
 13. GO TORUN
 14. **STAGGER start of JPMs S1 and S2. Allow S2 to complete actions on B04, then go to back panels before starting S1.**
- REQUIRED CONDITIONS:
 - Log Power $< 2 \times 10^{-6} \%$
- SIMULATOR EVALUATION PRE-CHECK
 - ☐ Correct IC
 - ☐ Alarm Silence Off
 - ☐ Procedures available, page checked, and clean
 - ☐ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40EP-9EO10, Standard Appendices, Appendix 8, Revision 82 available.
- **NOTE:** This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.



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- CALCULATOR Available

3. JPM PERFORMANCE:

- MALFUNCTIONS, OVERRIDES, etc. during JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
None		



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INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DO NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



**RO/SROI/SROU SIMULATOR JPMS2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- **A Loss of Coolant Accident has occurred**
- **The Reactor has been tripped**
- **SPTAs have been performed**
- **40EP-9EO03, Loss of Coolant Accident, has been entered**

INITIATING CUE:

- **The CRS directs you to perform Standard Appendix 8 of 40EP-9EO10, Standard Appendices, to place the Boron Dilution Alarm System (BDAS) in service.**
- ***THIS IS A TIME CRITICAL JPM.***



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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



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JPM START TIME:

NOTE

Boron Dilution Alarms must be confirmed operable within one hour after neutron flux is within the start-up range following a reactor shutdown.

Examiner Note:

The one hour time limit is the Time Critical aspect of this JPM. One hour is based on the regulatory commitment implied via the PVNGS Technical Specifications. TS Bases for LCO 3.3.12, Boron Dilution Alarm System (BDAS) states: "The Applicability is modified by a Note that the BDAS is required in MODE 3 within 1 hour after the neutron flux is within the startup range following a reactor shutdown. This allows the neutron flux level to decay to a level within the range of the excore startup channels and for the operator to initialize the BDAS. Neutron flux is defined to be within the startup range following a reactor shutdown when reactor power is 2E-6% NRTP or less."

	STEP	CUE	STANDARD
1. *	Appendix 8, Step 1 Place the Control/Startup Channel 1 switch to the "S-U CHAN 1" position.		Examinee places the CONTROL/STARTUP CHANNEL 1SELECTOR SEN-HS-5A switch to the "S-U CHAN 1" position (At panel B04).
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
2. *	Appendix 8, Step 2 Place the Control/Startup Channel 2 switch to the "S-U CHAN 2" position.		Examinee places the CONTROL/STARTUP CHANNEL 2SELECTOR SEN-HS-6A switch to the "S-U CHAN 2" position (At panel B04).
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
3. *	<p>Appendix 8, Step 3</p> <p>Press the “METER SELECT” pushbutton for Startup Channel 1 and check BOTH of the following:</p> <ul style="list-style-type: none"> • The green “CONTROL” light is extinguished. • The red “START UP” light is lit. 		<p>Examinee proceeds to the NIS cabinet(1JSFNUY0003) in back panel area of Control Room, to Startup Channel 1:</p> <p>On 1J-SEN-RY0005 CH1, examinee momentarily depresses the “METER SELECT” pushbutton for Startup Channel 1 and checks BOTH of the following:</p> <ul style="list-style-type: none"> • The green “CONTROL” light is extinguished. • The red “START UP” light is lit.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
4. *	<p>Appendix 8, Step 4</p> <p>Press the “HV PERMIT/HV ON” pushbutton for Startup Channel 1 and check that the amber light is lit.</p>		<p>Examinee momentarily depresses the “HV PERMIT/HV ON” pushbutton for Startup Channel 1 and observes that Startup Channel 1 amber light is LIT.</p>
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
5.	<p>Appendix 8, Step 5</p> <p>IF Startup Channel 1 is the only available channel, THEN perform a qualitative assessment of Channel 1 behavior.</p>	<p>INFORMATION CUE:</p> <p>Both Startup channels are available.</p>	<p>Examinee marks this Step as “N/A.” Continues on in procedure.</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			

	STEP	CUE	STANDARD
6.	<p>Appendix 8, Step 6</p> <p>Check that the “START UP HV LOW” alarm for Startup Channel 1 is NOT lit.</p>		<p>Examinee observes that the “START UP HV LOW” alarm for Startup Channel 1 <u>is</u> lit.</p> <p>Contingency Action 6.1: Examinee momentarily depresses the “STARTUP HV LOW” pushbutton for Startup Channel 1. Observes that the light goes out.</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



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	STEP	CUE	STANDARD
7.	Appendix 8, Step 7 Check that the “TROUBLE” alarm for Startup Channel 1 is NOT lit.		Examinee observes that the “TROUBLE” alarm for Startup Channel 1 is NOT lit.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
8.	Appendix 8, Step 8 Check that the “HIGH CPS” alarm for Startup Channel 1 is NOT lit.		Examinee observes that the “HIGH CPS” alarm for Startup Channel 2 is NOT lit.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
9. *	<p>Appendix 8, Step 9</p> <p>Press the “METER SELECT” pushbutton for Startup Channel 2 and check BOTH of the following</p> <ul style="list-style-type: none"> • The green “CONTROL” light is extinguished. • The red “START UP” light is lit 		<p>On 1J-SEN-RY0006 CH2, examinee momentarily depresses the “METER SELECT” pushbutton for Startup Channel 2 and checks BOTH of the following:</p> <ul style="list-style-type: none"> • The green “CONTROL” light is extinguished. • The red “START UP” light is LIT.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
10. *	<p>Appendix 8, Step 10</p> <p>Press the “HV PERMIT/HV ON” pushbutton for Startup Channel 2 and check that the amber light is lit.</p>		<p>Examinee momentarily depresses the “HV PERMIT/HV ON” pushbutton for Startup Channel 1 and observes that Startup Channel 2 amber light is LIT.</p>
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
11.	Appendix 8, Step 11 IF Startup Channel 2 is the only available channel, THEN perform a qualitative assessment Channel 2 behavior.	IF REQUESTED CUE: Both Startup channels are available.	Examinee marks this Step as “N/A.” Continues on in procedure.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
12.	Appendix 8, Step 12 Checkthat the “START UP HV LOW” alarm for Startup Channel 2 is NOT lit.		Examinee observes that the “START UP HV LOW” alarm for Startup Channel 2 is lit. Contingency Action 12.1: Examinee momentarily depresses the “STARTUP HV LOW” pushbutton for Startup Channel 2. Observes that the light goes out.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
13.	Appendix 8, Step 13 Checkthat the “TROUBLE” alarm for Startup Channel 2 is NOT lit.		Examinee observes that the “TROUBLE” alarm for Startup Channel 2 is NOT LIT.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
14.	Appendix 8, Step 14 Checkthat the “HIGH CPS” alarm for Startup Channel 2 is NOT lit.		Examinee observes that the “HIGH CPS” alarm for Startup Channel 2 is NOT lit.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
15. *	<p>Appendix 8, Step 15 and Step 15.a</p> <p>Perform the following for the Boron Dilution Alarm Channel SEN-IN-005:</p> <p>Press the "RESET" pushbutton.</p>		<p>Examinee proceeds to the Miscellaneous Equipment Cabinet Panel 1-J-ZJN-C06 in the Control Room back panel area.</p> <p>Examinee momentarily depresses the "RESET" pushbutton for channel SEN-NI-005.</p>
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
16.	<p>Appendix 8, Step 15.b</p> <p>Ensure the "FLUX/SET POINT" pushbutton is selected to the "FLUX" position.</p>		<p>Examinee notes that the "FLUX/SET POINT" pushbutton is backlit on FLUX.</p>
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
17.	Appendix 8, Step 15.c Checkthat the digital display is NOT flashing. YES/NO (YES meets the acceptance criteria).		Examinee notes that the digital display is NOT flashing. Examinee circles YES.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
18.	Appendix 8, Step 15.d Checkthat the decimal indicator is flashing at approximately one flash per second. YES/NO (YES meets the acceptance criteria).		Examinee notes that the decimal indicator is flashing at approximately one flash per second. Examinee circles YES.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
19. *	Appendix 8, Step 15.e Record flux reading.		Examinee records flux reading of approximately 3.2Vdc. EXAMINER NOTE: Typical to find readings in the range of 2.0 - 3.0Vdc
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
20.	Appendix 8, Step 15.f IF Boron Dilution Alarm Channel SEN-NI-005 is the only available channel, THEN Perform a qualitative assessment of Boron Dilution Alarm Channel SEN-NI-005 behavior.	INFORMATION CUE: Both Boron Dilution Alarm Channels are available.	No action necessary. Examinee continues in procedure.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
21. *	<p>Appendix 8, Step 16 and Step 16.a</p> <p>Perform the following for the Boron Dilution Alarm Channel SEN-NI-006:</p> <p>Press the “RESET” pushbutton.</p>		Examinee momentarily depresses the “RESET” pushbutton for channel SEN-NI-006.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
22.	<p>Appendix 8, Step 16.b</p> <p>Ensure the “FLUX/SET POINT” pushbutton is selected to the “FLUX” position.</p>		Examinee notes that the “FLUX/SET POINT” pushbutton is backlit on FLUX.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
23.	Appendix 8, Step 16.c Checkthat the digital display is NOT flashing. YES/NO (YES meets the acceptance criteria).		Examinee notes that the digital display is NOT flashing. Examinee circles YES.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
24.	Appendix 8, Step 16.d Checkthat the decimal indicator is flashing at approximately one flash per second. YES/NO (YES meets the acceptance criteria).		Examinee notes that the decimal indicator is flashing at approximately one flash per second. Examinee circles YES.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
25. *	Appendix 8, Step 16.e Record flux reading.		Examinee records flux reading of approximately 3.2Vdc. EXAMINER NOTE: Typical to find readings in the range of 2.0 - 3.0Vdc)
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
26.	Appendix 8, Step 16.f IF Boron Dilution Alarm Channel SEN-NI-006 is the only available channel, THEN perform a qualitative assessment of Boron Dilution Alarm Channel SEN-NI-006 behavior.	IF REQUESTED CUE: Both Boron Dilution Alarm Channels are available.	No action necessary. Examinee continues in procedure.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
27. *	<p>Appendix 8, Step 17 and Step 17.a</p> <p>Perform the following to determine Boron Dilution Alarm Channel acceptance criteria:</p> <p>Calculate the voltage difference between the Boron Dilution Alarm Channels:</p> <p>Highest Vdc _____ minus (-) Lowest Vdc _____ = _____ ΔVdc</p>		<p>Examinee records approximately 3.2Vdc(value from Step 15.e) in the space for Highest Vdc.</p> <p>Records approximately 3.2Vdc(value from Step 16.e) in the space for Lowest Vdc.</p> <p>Subtracts the Lowest Vdc from the Highest Vdc and records the difference (<.8 Vdc) in the space for ΔVdc</p>
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
28. *	<p>Appendix 8, Step 17.b</p> <p>Check that ΔV_{dc} is less than or equal to 0.8 Vdc between channels.</p> <p>Acceptance Criteria - ΔV_{dc} is less than or equal to 0.8 Vdc between channels.</p> <p>YES / NO (circle one) _____ (Initial)</p>		<p>Examinee determines that ΔV_{dc} is LESS THAN 0.8 Vdc between channels.</p> <p>Examinee circles "YES"</p>
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
29. *	<p>Appendix 8, Step 18 and Step 18.a</p> <p>Perform the following to determine Startup Channel acceptance criteria:</p> <p>Record Startup Channel 1.</p>		<p>Examinee enters between 15 and 25 CPS for Startup Channel 1.</p>
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
30. *	Appendix 8, Step 18.b RecordStartup Channel 2.		Examinee enters between 15 and 25 CPS for Startup Channel 2.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
31. *	Appendix 8, Step 18.c Calculate Highest Channel Max CPS: Lowest Channel CPS _____ X 2.5 = _____, which is the calculated Highest Channel Max CPS.		Examinee calculates the Highest ChannelMax CPS by multiplying the Lowest Channel CPS by 2.5. Examinee enters between 15 and 25 CPS (value in Step 18.b) in the space for Lowest Channel CPS. Multiplies the value entered by 2.5 and records the result in the space provided. Should enter approximately 50 (20 x 2.5 = 50)
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
32. *	<p>Appendix 8, Step 18.d</p> <p>Check that Startup Channel acceptance criteria has been met.</p> <p>Acceptance Criteria - calculated Highest Channel Max CPS is more than actual Highest Channel CPS.</p> <p>YES / NO (circle one)</p> <p>_____ (Initial)</p>		<p>Examinee determines that the calculated Highest Channel Max CPS (50) is GREATER THAN the actual Highest Channel CPS (~22).</p> <p>Examinee circles "YES" and enters initials.</p>
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
33.	<p>Appendix 8, Step 19</p> <p>Select the desired audio range and volume for the Startup Channels.</p>	<p>IF REQUESTED CUE:</p> <p>Direct examinee to select the highest reading channel.</p>	<p>Examinee may change the selector and volume to hear the clicks in the control room.</p>
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
34.	<p>Appendix 8, Step 20</p> <p>Checkthat proper overlap exists between the LOG Power Channel and the Startup Channel.</p>		<p>Examinee checks for proper overlap between the LOG Power Channel and the Startup Channel.</p> <p>EXAMINER NOTE:</p> <p>There is no established value for overlap. The examinee should take reasonable action to determine that the Log channels are responding.</p>
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
35. *	<p>Appendix 8, Step 21</p> <p>IF ALL of the acceptance criteria are met, THEN informthe CRS that the Boron Dilution Alarms are operable.</p>		<p>Examinee determines that that the acceptance criteria for Steps 17.b and 18.d were met.</p>
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
36.	Appendix 8, Step 22 Ensure the required signatures are obtained.	INFORMATION CUE: The CRS will obtain the required signatures.	Time JPM Started: _____ Time SR Operability Determined: _____ Elapsed Time: _____ EXAMINER NOTE: The Bases for TS 3.3.12, states: “The Applicability is modified by a Note that the BDAS is required in MODE 3 within 1 hour after the neutron flux is within the startup range following a reactor shutdown. This allows the neutron flux level to decay to a level within the range of the excore startup channels and for the operator to initialize the BDAS. Neutron flux is defined to be within the startup range following a reactor shutdown when reactor power is 2E-6% NRTP or less.”
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT



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APPLICANT

INITIAL CONDITIONS:

- A Loss of Coolant Accident has occurred
- The Reactor has been tripped
- SPTAs have been performed
- 40EP-9EO03, Loss of Coolant Accident, has been entered

INITIATING CUE:

- The CRS directs you to perform Standard Appendix 8 of 40EP-9EO10, Standard Appendices to place the Boron Dilution Alarm System (BDAS) in service.
- **THIS IS A TIME CRITICAL JPM.**

APPLICANT

STANDARD APPENDICES

Appendix 8,
Boron Dilution Alarm Check

INSTRUCTIONSCONTINGENCY ACTIONS

----- **NOTE** -----

Boron Dilution Alarms must be confirmed operable within one hour after neutron flux is within the start-up range following a reactor shutdown.

- ____ 1. Place the Control / Startup Channel 1 switch to the "S-U CHAN 1" position.
- ____ 2. Place the Control / Startup Channel 2 switch to the "S-U CHAN 2" position.
- ____ 3. Press the "METER SELECT" pushbutton for Startup Channel 1 and check **BOTH** of the following:
 - The green "CONTROL" light is extinguished
 - The red "START UP" light is lit
- ____ 4. Press the "HV PERMIT/HV ON" pushbutton for Startup Channel 1 and check that the amber light is lit.
- ____ 5. **IF** Startup Channel 1 is the only available channel,
THEN perform a qualitative assessment of Channel 1 behavior.

STANDARD APPENDICES

INSTRUCTIONS

- ____ 6. Check that the “START UP HV LOW” alarm for Startup Channel 1 is **NOT** lit.
- ____ 7. Check that the “TROUBLE” alarm for Startup Channel 1 is **NOT** lit.
- ____ 8. Check that the “HIGH CPS” alarm for Startup Channel 1 is **NOT** lit.
- ____ 9. Press the “METER SELECT” pushbutton for Startup Channel 2 and check **BOTH** of the following:
- The green “CONTROL” light is extinguished
 - The red “START UP” light is lit
- ____ 10. Press the “HV PERMIT/HV ON” pushbutton for Startup Channel 2 and check that the amber light is lit.
- ____ 11. **IF** Startup Channel 2 is the only available channel, **THEN** perform a qualitative assessment of Channel 2 behavior.
- ____ 12. Check that the “START UP HV LOW” alarm for Startup Channel 2 is **NOT** lit.
- ____ 13. Check that the “TROUBLE” alarm for Startup Channel 2 is **NOT** lit.

CONTINGENCY ACTIONS

- ____ 6.1 Press the “START UP HV LOW” pushbutton for Startup Channel 1.
- ____ 7.1 Press the “TROUBLE” pushbutton for Startup Channel 1.
- ____ 8.1 Press the “HIGH CPS” pushbutton for Startup Channel 1.
- ____ 12.1 Press the “START UP HV LOW” pushbutton for Startup Channel 2.
- ____ 13.1 Press the “TROUBLE” pushbutton for Startup Channel 2.

STANDARD APPENDICES

INSTRUCTIONS

_____ 14. Check that the "HIGH CPS" alarm for Startup Channel 2 is **NOT** lit.

_____ 15. Perform the following for Boron Dilution Alarm Channel SEN-NI-005:

- a. Press the "RESET" pushbutton.
- b. Ensure the "FLUX/SET POINT" pushbutton is selected to the "FLUX" position.
- c. Check that the digital display is **NOT** flashing.

Acceptance Criteria - digital display is NOT flashing.

YES / NO (circle one)

_____ (Initial)

- d. Check that the decimal indicator is flashing at approximately one flash per second.

Acceptance Criteria - decimal indicator is flashing at approximately one flash per second.

YES / NO (circle one)

_____ (Initial)

(continue)

CONTINGENCY ACTIONS

_____ 14.1 Press the "HIGH CPS" pushbutton for Startup Channel 2.

- c.1 Inform the CRS that acceptance criteria was **NOT** met.

- d.1 Inform the CRS that acceptance criteria was **NOT** met.

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS

____ 15. (continued)

- e. Record flux reading.

_____ Vdc

- f. **IF** Boron Dilution Alarm
Channel SEN-NI-005 is the
only available channel,
THEN
perform a qualitative
assessment of Boron Dilution
Alarm Channel
SEN-NI-005 behavior.

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS

- _____ 16. Perform the following for Boron Dilution Alarm Channel SEN-NI-006:

- a. Press the "RESET" pushbutton.
- b. Ensure the "FLUX/SET POINT" pushbutton is selected to the "FLUX" position.
- c. Check that the digital display is **NOT** flashing.

Acceptance Criteria - digital display is NOT flashing.

YES / NO (circle one)

_____ (Initial)

- d. Check that the decimal indicator is flashing at approximately one flash per second.

Acceptance Criteria - decimal indicator is flashing at approximately one flash per second.

YES / NO (circle one)

_____ (Initial)

(continue)

- c.1 Inform the CRS that acceptance criteria was **NOT** met.

- d.1 Inform the CRS that acceptance criteria was **NOT** met.

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS

____ 16. (continued)

- e. Record flux reading.

_____ Vdc

- f. **IF** Boron Dilution Alarm Channel SEN-NI-006 is the only available channel,
THEN
perform a qualitative assessment of Boron Dilution Alarm Channel SEN-NI-006 behavior.

____ 17. Perform the following to determine Boron Dilution Alarm Channel acceptance criteria:

- a. Calculate the voltage difference between the Boron Dilution Alarm Channels:

Highest Vdc _____

minus (-)

Lowest Vdc _____

= _____ Δ Vdc

- b. Check that Δ Vdc is less than or equal to 0.8 Vdc between channels.

- b.1 Inform the CRS that acceptance criteria was **NOT** met.

Acceptance Criteria - Δ Vdc is less than or equal to 0.8 Vdc between channels.

YES / NO (circle one)

_____ (Initial)

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS

- _____ 18. Perform the following to determine Startup Channel acceptance criteria:

a. Record Startup Channel 1:

_____ CPS.

b. Record Startup Channel 2:

_____ CPS

c. Calculate Highest Channel Max CPS:

Lowest Channel CPS _____

X 2.5 = _____, which is the calculated Highest Channel Max CPS.

d. Check that Startup Channel acceptance criteria has been met.

Acceptance Criteria - calculated Highest Channel Max CPS is more than actual Highest Channel CPS.

YES / NO (circle one)

_____ (Initial)

d.1 Inform the CRS that acceptance criteria was **NOT** met.

- _____ 19. Select the desired audio range and volume for the Startup Channels.

- _____ 20. Check that proper overlap exists between the Log Power Channel and the Startup Channel.

STANDARD APPENDICES

INSTRUCTIONS

- ____ 21. **IF ALL** of the acceptance criteria are met,
THEN
inform the CRS that the Boron Dilution Alarms and Startup Channels are operable.

- ____ 22. Ensure the required signatures are obtained.

Performed By

Acceptance Reviewer

CRS / SM

DATE

CONTINGENCY ACTIONS

- ____ 21.1 **IF ANY** of the acceptance criteria has **NOT** been met,
THEN
- a. Inform the CRS which acceptance criteria was not met.
 - b. Initiate performance of 40ST-9ZZ24, Startup Channel High Neutron Flux Alarm Inoperable procedure.

End of Appendix



RO/SROI SIMULATOR JPM S3
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JPM BASIS INFORMATION

TASK:	0790010401 Energize normal service transformer NBN-X01(X02) 0790010801 Energize 4.16kv bus NBN-S01(S02)						
TASK STANDARD:	Normal Service Transformer NBN-X02 and 4.16kv bus NBN-S02 are energized						
K/A:	3.6 062 A4.07		K/A RATING:	RO:	3.1	SRO:	3.1
10 CFR 55:	45(a)(5), 45(a)(8)						
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	10 minutes			
REFERENCES:	40OP-9NB01, 4.16 kV Non-Class 1E Power (NB)						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **No**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Alan Malley Date: 08/06/2014

Revised By: Rusty Quick Date: 03/26/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



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1. SIMULATOR SETUP:

- IC#: 601
- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

- SPECIAL INSTRUCTIONS:
 1. **SIMULATOR DRIVER WILL NEED TO FOLLOW ALONG WITH THIS JPM TO PROVIDE CUES AS NEEDED. SIMULATOR DRIVER ACTION WILL BE REQUIRED FOR STEPS 12 and 13.**
 2. **IF IC601 is used, reset to IC 601**
 - Run scenario file **2015 NRC S-3 and S-4.scn** from exam flash drive.
 3. **GO TO RUN**, acknowledge alarms, **THEN Go To Step 5**
 4. **IF IC 601 is NOT used, reset to IC 4, GO TORUN**
 - Ensure Normal Chillers WCN-E01C and WCN-E02 are not running
 - Ensure NCN-P01B, TCN-P01B, and PWN-P01B are **NOT** running (shift pumps if necessary)
 - If running with 2015 NRC scenario S-4 **THEN** ensure Containment Purge is secured per 40OP-9CP01
 - Run scenario file **2015 NRC S-3 and S-4.scn** from exam flash drive.
 - Ensure handswitch NBN-HK-S01C, S02-S02 Transfer Switch is in MANUAL
 - Ensure NBN-X02 and NBN-S02 are de-energized per 40OP-9BN01.
 5. Provide **INITIATING CUE**
 6. **GO TO RUN**
- REQUIRED CONDITIONS:
 - NBN-X02, Normal Service Transformer, is de-energized
 - NBN-S02, 4.16kV non-class bus, is de-energized
 - NBN-HK-S01C, S02-S02 Transfer Switch is in MANUAL
 - Containment Purge is secured (if running with 2015 NRC scenario S-4)
- SIMULATOR EVALUATION PRE-CHECK
 - ☐ Correct IC
 - ☐ Alarm Silence Off
 - ☐ Procedures available, page checked, and clean
 - ☐ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

5. SPECIAL TOOLS/EQUIPMENT:

- 40OP-9NB01, 4.16 kV, Non-Class 1E Power (NB), Revision 25 available.



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NOTE: This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

6. JPM PERFORMANCE:

- REMOTE FUNCTIONS, MALFUNCTIONS, OVERRIDES, etc. **during** JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
13.	KEY 1 (IRF crB2SW02WCNE01C_5 f:OUT k:1)	Opens Control Power Breaker to NBN-S02F
14.	KEY 2 (IRF crB2SW02WCNE02_5 f:OUT k:2)	Opens Control Power Breaker to NBN-S02G



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TASK CONDITIONS**

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DO NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



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INITIAL CONDITIONS:

- Normal Service Transformer NBN-X02 and 4.16Kv Non-Class Bus NBN-S02 were de-energized to repair the stabs for the normal supply breaker for NBN-S02.
- All repairs are complete.

INITIATING CUE:

- The CRS directs you to energize NBN-X02 and NBN-S02 per 40OP-9NB01 Sections 6.2 and 6.6.
- All prerequisites for Section 6.2 and steps 6.2.2.1 through 6.2.2.10 have been completed.
- All prerequisites except Step 6.6.1.3 for Section 6.6 have been completed.
- The Area 4 operator has been briefed and is standing by to perform actions in the field.
- **TIME COMPRESSION MAY BE USED FOR OPERATOR ACTIONS IN THE FIELD.**



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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



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JPM START TIME:

	STEP	CUE	STANDARD
1. *	Step 6.2.2.11: Close NAN-S02N, 13.8 kV Supply Breaker To Normal Service Transformer NBN-X02, 13.8-4.16 kV Normal Svce Xfmr, using NBN-HS-S02N, Normal Serv Xfmr X02.		Examinee closes NAN-S02 using handswitch NBN-HS-S02N on panel B01
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
2.	Step 6.2.2.12: Check NBN-EI-S02A voltmeter for normal voltage of 3.74 kV to 4.37 kV.		Examinee checks for normal voltage on voltmeter NBN-EI-S02A
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
3.	Step 6.6.2.1: Ensure D-panel Breaker NKN-D42 72-08, DC Control Power For NBN-S02, is closed.	IF REQUESTED CUE: Breaker NKN-D42 72-08, DC Control Power for NBN-S02 is closed.	Examinee directs area operator to ensure NKN-D42 72-08 is closed OR determines control power to NBN-S02 is closed due to green lights on NBN-S02 handswitches on B01.

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
4.	Step 6.6.2.2: Direct a nuclear operator to check inside NBN-S02 breaker cubicles for ALL of the following: <ul style="list-style-type: none"> • Tags • Foreign matter • DC control power fuses properly installed • 125V DC control power (RRC) to breaker closed 	INFORMATION Cue: The area operator reports no tags or foreign matter in NBN-S02. All DC control power fuses are properly installed and all 125V DC control power (RRC) breakers are closed.	Examinee directs an area operator to check inside NBN-S02 cubicles for tags, foreign matter, DC control power fuses installed, 125V DC to breakers closed.

SAT / UNSAT
Comments (required for UNSAT):



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	STEP	CUE	STANDARD
5.	Step 6.6.2.3: Notify the SM/CRS of the results of the NBN-S02 breaker cubicle inspection performed in Step 6.6.2.2.	INFORMATION CUE: The CRS acknowledges the results of the cubicle inspection.	Examinee informs SM/CRS of results of cubicle inspection.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
6.	<p>Step 6.6.2.4:</p> <p>Check ALL of the following NBN-S02 breakers are open or racked out as directed by the SM/CRS:</p> <ul style="list-style-type: none"> • NBN-S02A, Normal Supply Breaker On NBN-S02 • NBN-S02D, CDNP01C “C” Condensate Pump • NBN-S02E, EDN-P01A “A” Htr Drain Tank Pump • NBN-S02F, WCNE02 Small Normal Chiller • NBN-S02G, WCNE01C “C” Normal Chiller • NBN-S02H, PWNP01B “B” Plant Cooling Water Pump • NBN-S02J, TCNP01B “B” TC Pump • NBN-S02K, NCNP01B “B” NC Pump 	<p>IF REQUESTED CUE:</p> <p>The area operator reports all of the following breakers are racked in and open:</p> <ul style="list-style-type: none"> • NBN-S02A, Normal Supply Breaker On NBN-S02 • NBN-S02D, CDNP01C “C” Condensate Pump • NBN-S02E, EDN-P01A “A” Htr Drain Tank Pump • NBN-S02F, WCNE02 Small Normal Chiller • NBN-S02G, WCNE01C “C” Normal Chiller • NBN-S02H, PWNP01B “B” Plant Cooling Water Pump • NBN-S02J, TCNP01B “B” TC Pump • NBN-S02K, NCNP01B “B” NC Pump 	<p>The examinee directs an area operator to ensure all of the following breakers are open OR may use the handswitch indications in the control room to ensure the breakers are open.</p> <ul style="list-style-type: none"> • NBN-S02A –NBN Normal Supply Breaker (handswitch NBN-HS-S02A on B01) • NBN-S02D - Condensate Pump C (handswitch CDN-HS-13 on B05) • NBN-S02E – Htr Drain Pump A (handswitch EDN-HS-506 on B06) • NBN-S02F – Normal Chiller E02 (handswitch WCN-HS-4A on B07) • NBN-S02G – Normal Chiller E01C (handswitch WCN-HS-3A on B07) • NBN-S02H – PW Pump B (handswitch PWN-HS-6 on B07) • NBN-S02J – TC Pump B (handswitch TCN-HS-22 on B07) • NBN-S02K – NC Pump B (handswitch NCN-HS-2 on B07)
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



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	STEP	CUE	STANDARD
7.	Step 6.6.2.5: Reset NBN-S02 relay targets per 40DP-00P02, Relay Resetting.	INFORMATION CUE: All targets are reset on NBN-S02 except for the undervoltage relays.	Examinee directs area operator to reset NBN-S02 relay targets per 40DP-90P02.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
8.	Step 6.6.2.6: Ensure NBN-S02A, Normal Supply Breaker, on NBN-S02, is racked in per Appendix A - Breaker Racking Instructions.	IF REQUESTED CUE: NBN-S02A, Normal Supply Breaker is racked in.	Examinee directs an area operator to ensure NBN-S02A is racked in <u>OR</u> may remember from STEP 6 cue that this breaker is racked in.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
9.	Step 6.6.2.7: Ensure BOTH of the following breakers for NBN-S02, are closed: <ul style="list-style-type: none"> • D-panel Breaker NHN-D06 52-22, Space Heater • D-panel Breaker NHN-D06 52-20, Blower Cooling Fans 	INFORMATION CUE: Both of the following breakers are closed: <ul style="list-style-type: none"> • D-panel Breaker NHN-D06 52-22, Space Heater • D-panel Breaker NHN-D06 52-20, Blower Cooling Fans 	Examinee directs an area operator to ensure both of the following breakers are open: <ul style="list-style-type: none"> • D-panel Breaker NHN-D06 52-22, Space Heater • D-panel Breaker NHN-D06 52-20, Blower Cooling Fans
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
10.	Step 6.6.2.8: Check NBN-S02A, Normal Supply Breaker, on NBN-S02, is open.		Examinee checks NBN-S02A normal supply breaker is open using handswitch NBN-HS-S02A on B01.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
11.	Step 6.6.2.9: IF NBN-S01C, S01-S02 Tie breaker, is available for operation, THEN perform the following: a. Check NBN-HK-S01C, S01-S02 Transfer Switch, is in MANUAL. b. Check NBN-S01C, S01-S02 Tie Breaker, is open.		Examinee checks NBN-HK-S01C in MANUAL and ensures NBN-S01C is open using handswitch NBN-HS-S01C on B01.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
12.	Step 6.6.2.9: IF NBN-S01C, S01-S02 Tie breaker, is available for operation, THEN perform the following: c. Ensure breaker NBN-S01C, S01-S02 Tie Breaker, is racked in per Appendix A - Breaker Racking Instructions.	IF REQUESTED CUE: NBN-S01C, S01-S02 Tie Breaker, is racked in	Examinee directs an operator to ensure breaker NBN-S01C is racked in <u>OR</u> may use lights on B01.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
13.	Step 6.6.2.10: IF NBN-S02F is racked in, THEN ensure the 125 VDC breaker (RRC) for NBN-S02F, is open.	<u>SIMULATOR DRIVER ACTION REQUIRED.</u> <u>Insert Key 1</u> After DC control power breaker is open, THEN INFORMATION CUE: The 125 VDC breaker (RRC) for NBN-S02F is open.	Examinee determines NBN-S02F is racked in from Step 6 of the JPM <u>OR</u> by using indicating lights and directs an operator to ensure the 125 VDC breaker for NBN-S02F is open.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
14.	Step 6.6.2.11: IF NBN-S02G is racked in, THEN ensure the 125 VDC breaker (RRC) for NBN-S02G, is open.	<u>SIMULATOR DRIVER ACTION REQUIRED.</u> <u>Insert Key 2</u> After DC control power breaker is open, THEN INFORMATION CUE: The 125 VDC breaker (RRC) for NBN-S02G is open.	Examinee determines NBN-S02F is racked in from Step 6 of the JPM <u>OR</u> by using indicating lights and directs an operator to ensure the 125 VDC breaker for NBN-S02G is open.

SAT / UNSAT

Comments (required for UNSAT):



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	STEP	CUE	STANDARD
15. *	Step 6.6.2.12: Place Synchronizing Switch, NBN-SS-S02A, 4.16 kV S02 Supply, for the Normal Supply Breaker on NBN-S02, to ON.		Examinee placing Synchronizing Switch NBN-SS-S02A to ON
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
16. *	Step 6.6.2.13: Close NBN-S02A, Normal Supply Breaker, on NBN-S02, using NBN-HS-S02A, 4.16 kV S02 Supply.		Examinee closes NBN-S02A using handswitch NBN-HS-S02A on B01 to energize NBN-S02
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
17.	Step 6.6.2.14: Check ANY of the following for proper voltage of 3.74 kV to 4.37 kV: <ul style="list-style-type: none"> • NBN-EI-S02 voltmeter • ERFDADS 		Examinee checks the voltmeter on S02 or ERFDADS to check for proper voltage of 3.74 kV to 4.37 kV.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
18.	Step 6.6.2.15: Place Synchronizing Switch, NBN-SS-S02A, 4.16 kV S02 Supply, to OFF.	INFORMATION CUE after step complete: Another Operator will complete the rest of this procedure.	Examinee takes Synchronizing Switch NBN-SS-S02A to OFF
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



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APPLICANT

INITIAL CONDITIONS:

- Normal Service Transformer NBN-X02 and 4.16Kv Non-Class Bus NBN-S02 were de-energized to repair the stabs for the normal supply breaker for NBN-S02.
- All repairs are complete.

INITIATING CUE:

- The CRS directs you to energize NBN-X02 and NBN-S02 per 40OP-9NB01 Sections 6.2 and 6.6.
- All prerequisites for Section 6.2 **and** steps 6.2.2.1 through 6.2.2.10 have been completed.
- All prerequisites **except** Step 6.6.1.3 for Section 6.6 have been completed.
- The Area 4 operator has been briefed and is standing by to perform actions in the field.
- **TIME COMPRESSION MAY BE USED FOR OPERATOR ACTIONS IN THE FIELD.**

APPLICANT

4.16 kV Non-Class 1E Power (NB)

40OP-9NB01

Revision
25

6.2 Energizing Normal Service Xfmr NBN-X02

6.2.1 Prerequisites

- AM* 6.2.1.1 NAN-S02 is energized per 40OP-9NA03, 13.8 kV Electrical System (NA).
- AM* 6.2.1.2 Breaker NAN-S02N is racked in and available for operation.
- AM* 6.2.1.3 NHN-M21 is energized per 40OP-9NH01, 480V Non-Class 1E MCC.
- AM* 6.2.1.4 NHN-M08 is energized per 40OP-9NH01, 480V Non-Class 1E MCC.
- AM* 6.2.1.5 NKN-D43 is energized per 40OP-9NK01, 125VDC Non-Class 1E Electrical System (NK).
- AM* 6.2.1.6 Electrical Maintenance has confirmed that PT fuses are installed and drawer inserted at NBN-S02B Lower Drawer, Line Side PT for NBN-X02 (Ind/Synch).

6.2.2 Instructions

- AM* 6.2.2.1 Check NAN-S02N, 13.8 kV Supply Breaker To Normal Service Transformer NBN-X02, is open.
- AM* 6.2.2.2 Check NBN-S02A, Normal Supply Breaker on NBN-S02, is open.
- AM* 6.2.2.3 Ensure BOTH of the following breakers are closed:
 - AM* MCC Breaker NHN-M0820, Transformer Cooling Normal Supply Breaker
 - AM* MCC Breaker NHN-M2134, Transformer Cooling Alternate Supply Breaker
- AM* 6.2.2.4 Ensure ALL of the following breakers are closed:
 - AM* • D-panel Breaker NKN-D43 72-08, Local Annunciator Feeder Breaker
 - AM* • D-panel Breaker NHN-D09 72-14, Non-Seg Phase Bus Duct NBN-A02 Space Heater
 - AM* • D-panel Breaker NHN-D06 72-20, NBN-S02A Switchgear Breakers Cooling Fans
 - AM* • D-panel Breaker NHN-D06 52-22, NBN-S02 Space Heater Breaker

4.16 kV Non-Class 1E Power (NB)

40OP-9NB01

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Am 6.2.2.5 Check ALL of the following NBN-X02, 13.8-4.16 kV Normal Svce Xfmr, parameters by observing the local gauges at the transformer:

- Am • Transformer nitrogen pressure 0.5 to 6.5 psig
- Am • Oil temperature less than 90°C
- Am • Liquid level between the high and low mark (approximately at the 25°C mark)

Am 6.2.2.6 Ensure annunciator toggle switches are in ON at NBN-X02, 13.8-4.16 kV Normal Svce Xfmr.

Am 6.2.2.7 Evaluate NBN-X02, 13.8-4.16 kV Normal Svce Xfmr alarms for the current condition of the transformer.

Am 6.2.2.8 Ensure HS, NBN-X02, 13.8-4.16 kV Normal Svce Xfmr Heater Switch, located in the transformer cabinet, is in AUTO.

Am 6.2.2.9 Ensure 43, NBN-X02, 13.8-4.16 kV Normal Svce Xfmr Fan Control Switch, located in the transformer cabinet, is in AUTO.

Am 6.2.2.10 Ensure ALL of the following NBN-X02, 13.8-4.16 kV Normal Svce Xfmr Fan Control Breakers, located in the transformer cabinet, are ON:

- Am • 8-1
- Am • 8-2
- Am • 8-3
- Am • 8-4

___ 6.2.2.11 Close NAN-S02N, 13.8 kV Supply Breaker To Normal Service Transformer NBN-X02, 13.8-4.16 kV Normal Svce Xfmr, using NBN-HS-S02N, Normal Serv Xfmr X02.

___ 6.2.2.12 Check NBN-EI-S02A voltmeter for normal voltage of 3.74 kV to 4.37 kV.

End of Section 6.2

4.16 kV Non-Class 1E Power (NB)

40OP-9NB01

Revision
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6.6 Energizing 4.16 kV NBN-S02

6.6.1 Prerequisites

- Am 6.6.1.1 NKN-D42 is energized per 40OP-9NK01, 125VDC Non-Class 1E Electrical System (NK).
- Am 6.6.1.2 NHN-D06 is energized per 40OP-9NH01, 480V Non-Class 1E MCC.
- ___ 6.6.1.3 NBN-X02, Normal Service Transformer, is energized per Section 6.2, Energizing Normal Service Xfmr NBN-X02.
- Am 6.6.1.4 Electrical Maintenance has confirmed that BOTH of the following fuses are installed and drawers inserted:

Am NBN-S02B Lower Drawer (Line PT for NBN-X02 Ind/Synch)

Am NBN-S02B Upper Drawer (Bus PT for NBN-X02 Load Shed)

6.6.2 Instructions

- ___ 6.6.2.1 Ensure D-panel Breaker NKN-D42 72-08, DC Control Power For NBN-S02, is closed.
- ___ 6.6.2.2 Direct a nuclear operator to check inside NBN-S02 breaker cubicles for ALL of the following:
- ___ • Tags
 - ___ • Foreign matter
 - ___ • DC control power fuses properly installed
 - ___ • 125V DC control power (RRC) to breaker closed
- ___ 6.6.2.3 Notify the SM/CRS of the results of the NBN-S02 breaker cubicle inspection performed in Step 6.6.2.2.



4.16 kV Non-Class 1E Power (NB)

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- ___ 6.6.2.4 Check ALL of the following NBN-S02 breakers are open or racked out as directed by the SM/CRS:
- ___ • NBN-S02A, Normal Supply Breaker On NBN-S02
 - ___ • NBN-S02D, CDNP01C “C” Condensate Pump
 - ___ • NBN-S02E, EDN-P01A “A” Htr Drain Tank Pump
 - ___ • NBN-S02F, WCNE02 Small Normal Chiller
 - ___ • NBN-S02G, WCNE01C “C” Normal Chiller
 - ___ • NBN-S02H, PWNP01B “B” Plant Cooling Water Pump
 - ___ • NBN-S02J, TCNP01B “B” TC Pump
 - ___ • NBN-S02K, NCNP01B “B” NC Pump
- ___ 6.6.2.5 Reset NBN-S02 relay targets per 40DP-0OP02, Relay Resetting.
- ___ 6.6.2.6 Ensure NBN-S02A, Normal Supply Breaker, on NBN-S02, is racked in per Appendix A - Breaker Racking Instructions.
- ___ 6.6.2.7 Ensure BOTH of the following breakers for NBN-S02, are closed:
- D-panel Breaker NHN-D06 52-22, Space Heater
 - D-panel Breaker NHN-D06 52-20, Blower Cooling Fans
- ___ 6.6.2.8 Check NBN-S02A, Normal Supply Breaker, on NBN-S02, is open.
- ___ 6.6.2.9 **IF** NBN-S01C, S01-S02 Tie breaker, is available for operation, **THEN** perform the following:
- ___ a. Check NBN-HK-S01C, S01-S02 Transfer Switch, is in MANUAL.
 - ___ b. Check NBN-S01C, S01-S02 Tie Breaker, is open.
 - ___ c. Ensure breaker NBN-S01C, S01-S02 Tie Breaker, is racked in per Appendix A - Breaker Racking Instructions.

4.16 kV Non-Class 1E Power (NB)

40OP-9NB01

Revision
25**CAUTION**

When NBN-S02 is energized, normal chillers WCN-E01C and WCN-E02 will receive an auto start if racked in. Removing control power from NBN-S02F and NBN-S02G will prevent an unplanned start of WCN-E01C or WCN-E02.

- ___ 6.6.2.10 **IF** NBN-S02F is racked in,
THEN ensure the 125 VDC breaker (RRC) for NBN-S02F, is open.
- ___ 6.6.2.11 **IF** NBN-S02G is racked in,
THEN ensure the 125 VDC breaker (RRC) for NBN-S02G, is open.
- ___ 6.6.2.12 Place Synchronizing Switch, NBN-SS-S02A, 4.16 kV S02 Supply, for the Normal Supply Breaker on NBN-S02, to ON.
- ___ 6.6.2.13 Close NBN-S02A, Normal Supply Breaker, on NBN-S02, using NBN-HS-S02A, 4.16 kV S02 Supply.
- ___ 6.6.2.14 Check ANY of the following for proper voltage of 3.74 kV to 4.37 kV:
 - ___ • NBN-EI-S02 voltmeter
 - ___ • ERFDADS
- ___ 6.6.2.15 Place Synchronizing Switch, NBN-SS-S02A, 4.16 kV S02 Supply, to OFF.
- ___ 6.6.2.16 Close NBN-S02 load feeder breakers as directed by the SM/CRS.
- ___ 6.6.2.17 **IF BOTH** of the following conditions exist:
 - ___ • NBN-S02F is racked in
 - ___ • NBN-S02 has been energized for at least 30 seconds**THEN** ensure the 125 VDC breaker (RRC) for NBN-S02F, is closed.
- ___ 6.6.2.18 **IF BOTH** of the following conditions exist:
 - ___ • NBN-S02G is racked in
 - ___ • NBN-S02 has been energized for at least 30 seconds**THEN** ensure the 125 VDC breaker (RRC) for NBN-S02G, is closed.

4.16 kV Non-Class 1E Power (NB)

40OP-9NB01

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- ___ 6.6.2.19 **IF** NBN-S01 is energized,
THEN place NBN-HK-S01C, S01-S02 Transfer Switch, to AUTO.
- ___ 6.6.2.20 Reset NBN-S02 relay targets per 40DP-0OP02, Relay Resetting.

End of Section 6.6



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JPM BASIS INFORMATION

TASK:	0500010601 Place Containment Refueling Purge Subsystem in Service						
TASK STANDARD:	Containment Power Access Purge Subsystem placed in service.						
K/A:	3.8 029 A2.03		K/A RATING:	RO:	2.7	SRO:	3.1
10 CFR 55:	45(a)(3), 45(a)(13)						
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	10 minutes			
REFERENCES:	40OP-9CP01, Containment Purge System, Revision 24						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **No**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Alan Malley Date: 08/06/2014

Revised By: Rusty Quick Date: 03/30/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



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1. SIMULATOR SETUP:

- IC#: 601
- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

- SPECIAL INSTRUCTIONS:
 1. IF IC601 is used, reset to **IC 601**, GO TORUN
 2. Run scenario file **2015 NRC S-3 and S-4.scn** from exam flash drive.
 3. Acknowledge alarms
 4. Hang an Equipment Status Tag on CPN-HS-1 stating “T-Mod has been installed per 40OP-9CP01 (HVAC)”.
 5. Go To Freeze, **THEN** Go To **Step 7**
 6. IF IC 601 is **NOT** used, reset to IC 4, GO TORUN
 - Ensure Containment Purge is secured per 40OP-9CP01
 - Open breakers for CPA(B)-UV-2A, 2B, 3A and 3B using the commands from the JPM PERFORMANCE step below.
 - Run scenario file **2015 NRC S-3 and S-4.scn** from exam flash drive.
 7. Provide **INITIATING CUE**
 8. GO TORUN
- REQUIRED CONDITIONS:
 - Simulator in Mode 5 or 6
 - Containment Purge is secured
- SIMULATOR EVALUATION PRE-CHECK
 - ☐ Correct IC
 - ☐ Alarm Silence Off
 - ☐ Procedures available, page checked, and clean
 - ☐ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40OP-9CP01, (Containment Purge System), Revision 24 available.

NOTE: This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- REMOTE FUNCTIONS, MALFUNCTIONS, OVERRIDES, etc. **during** JPM



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STEP	COMMAND/COMMUNICATION	DESCRIPTION
2.	Key 3 IRF crB4CH01CPAUV2A_1 k:3 f:CLOSE	Closes breaker PHA-M3516 for Refueling Purge Isol Valve CPA-UV-2A
4.	Key 4 IRF crB4CH01CPAUV2B_1 k:4 f:CLOSE	Closes breaker PHA-M3517 for Refueling Purge Isol Valve CPA-UV-2B
6.	Key 5 IRF crB4CH01CPBUV3A_1 k:5 f:CLOSE	Closes breaker PHB-M3622 for Refueling Purge Isol Valve CPB-UV-3A
8.	Key 6 IRF crB4CH01CPBUV3B_1 k:6 f:CLOSE	Closes breaker PHB-M3623 for Refueling Purge Isol Valve CPB-UV-3B



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INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DO NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



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INITIAL CONDITIONS:

- Unit 1 is in Mode 5.
- The Containment has been vented.
- A Radioactive Gas Release Permit has been approved for using both supply and exhaust fans.
- HVAC has greased the fan motor bearings.
- The Security Operations Section leader has been notified and compensatory measures are in place for opening the Refueling Purge Valves. The Security Operations Section Leader's name has been recorded in the Control Room Log.
- 74ST-9SQ07, Radiation Monitoring System Shiftly Surveillance Test, is current for BOTH of the following:
 - ❖ RU-37
 - ❖ RU-38

INITIATING CUE:

- The CRS directs you to place the Containment Refueling Purge system in service per Section 6.4 of 40OP-9CP01.
- All Prerequisites have been completed.
- Section 6.4 has been completed through Step 6.4.3.



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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



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JPM START TIME:

	STEP	CUE	STANDARD
1. *	Step 6.4.4: Unlock MCC Breaker PHA-M3516, Cmtt Refuel Purge Isol Valve CPA-UV-2A.	INFORM CUE: Breaker PHA-M3516, Cmtt Refuel Purge Isol Valve CPA-UV-2A is unlocked.	Examinee directs an area operator to unlock Breaker PHA-M3516, Cmtt Refuel Purge Isol Valve CPA-UV-2A.

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
2. *	Step 6.4.5: Close MCC Breaker PHA-M3516, Cmtt Refuel Purge Isol Valve CPA-UV-2A.	<u>SIMULATOR DRIVER</u> <u>ACTION REQUIRED-Key 3</u>	Examinee directs an area operator to close Breaker PHA-M3516, Cmtt Refuel Purge Isol Valve CPA-UV-2A.
		After Key 3 Initiated: INFORM CUE: Breaker PHA-M3516, Cmtt Refuel Purge Isol Valve CPA-UV-2A is closed.	Examiner Note: The green light above handswitch CPA-HS-2 will illuminate when this breaker is closed. Examiner Note: The examinee may perform Steps 1 and 2 together.

SAT / UNSAT
Comments (required for UNSAT):



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	STEP	CUE	STANDARD
3. *	Step 6.4.6: Unlock MCC Breaker PHA-M3517, Cmtt Refuel Purge Isol Valve CPA-UV-2B.	INFORMATION CUE: Breaker PHA-M3517, Cmtt Refuel Purge Isol Valve CPA-UV-2B is unlocked.	Examinee directs an area operator to unlock Breaker PHA-M3517, Cmtt Refuel Purge Isol Valve CPA-UV-2B.

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
4. *	Step 6.4.7: Close MCC Breaker PHA-M3517, Cmtt Refuel Purge Isol Valve CPA-UV-2B.	<u>SIMULATOR DRIVER</u> <u>ACTION REQUIRED-Key 4</u> After Key 4 Initiated: INFORM CUE: Breaker PHA-M3517, Cmtt Refuel Purge Isol Valve CPA-UV-2B is closed.	Examinee directs an area operator to close Breaker PHA-M3517, Cmtt Refuel Purge Isol Valve CPA-UV-2B. Examiner Note: The examinee may perform Steps 3 and 4 together.

SAT / UNSAT
Comments (required for UNSAT):



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	STEP	CUE	STANDARD
5. *	Step 6.4.8: Unlock MCC Breaker PHB-M3622, Cmtt Refuel Purge Isol Valve CPB-UV-3A.	INFORMATION CUE: Breaker PHB-M3622, Cmtt Refuel Purge Isol Valve CPB-UV-3A is unlocked.	Examinee directs an area operator to unlock Breaker PHA-M3622, Cmtt Refuel Purge Isol Valve CPB-UV-3A.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
6. *	Step 6.4.9: Close MCC Breaker PHB-M3622, Cmtt Refuel Purge Isol Valve CPB-UV-3A.	<u>SIMULATOR DRIVER</u> <u>ACTION REQUIRED-Key 5</u> After Key 5 Initiated: INFORM CUE: Breaker PHB-M3622, Cmtt Refuel Purge Isol Valve CPB-UV-3A is closed.	Examinee directs an area operator to close Breaker PHA-M3622, Cmtt Refuel Purge Isol Valve CPB-UV-3A. Examiner Note: The green light above handswitch CPB-HS-3 will NOT illuminate when this breaker is closed. Examiner Note: The examinee may perform Steps 5 and 6 together.

SAT / UNSAT

Comments (required for UNSAT):



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	STEP	CUE	STANDARD
7. *	Step 6.4.10: Unlock MCC Breaker PHB-M3623, Cmtt Refuel Purge Isol Valve CPB-UV-3B.	INFORM CUE: Breaker PHB-M3623, Cmtt Refuel Purge Isol Valve CPB-UV-3B is unlocked.	Examinee directs an area operator to unlock Breaker PHA-M3623, Cmtt Refuel Purge Isol Valve CPB-UV-3B.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
8. *	Step 6.4.11: Close MCC Breaker PHB-M3623, Cmtt Refuel Purge Isol Valve CPB-UV-3B.	<u>SIMULATOR DRIVER</u> <u>ACTION REQUIRED-Key 6</u> After Key 6 Initiated: INFORM CUE: Breaker PHB-M3623, Cmtt Refuel Purge Isol Valve CPB-UV-3B is closed.	Examinee directs an area operator to close Breaker PHA-M3623, Cmtt Refuel Purge Isol Valve CPB-UV-3B. Examiner Note: The green light above handswitch CPB-HS-3 will illuminate when this breaker is closed. Examiner Note: The examinee may perform Steps 7 and 8 together.

SAT / UNSAT

Comments (required for UNSAT):



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	STEP	CUE	STANDARD
9.	Step 6.4.12: Ensure the Instrument Air supply valve to BOTH of the following are open: (Inside panel CPN-LAP-01) <ul style="list-style-type: none"> • CPN-HY-006A, Solenoid For Pneun Damper CPN-M02A • CPN-HY-006B, Solenoid For Pneun Damper CPN-M02B 	INFORM CUE: Both of the following supply valves are open: <ul style="list-style-type: none"> • CPN-HY-006A, Solenoid For Pneun Damper CPN-M02A • CPN-HY-006B, Solenoid For Pneun Damper CPN-M02B 	The examinee directs an area operator to open both of the following air supply valves: <ul style="list-style-type: none"> • CPN-HY-006A, Solenoid For Pneun Damper CPN-M02A • CPN-HY-006B, Solenoid For Pneun Damper CPN-M02B
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
10.	Step 6.4.13: IF Containment integrity is set for core alterations or irradiated fuel movement in the Containment, THEN direct the Radiation Monitoring Technician to ensure 74ST-9SQ07, Radiation Monitoring System Shiftly Surveillance Test, is current for BOTH of the following: <ul style="list-style-type: none"> • RU-37 • RU-38 	IF Requested Cue: Containment Integrity is set for core alterations	Examinee determines from the Initial Conditions that 74ST-9SQ07 is current for both RU-37 and RU-38.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
11.	Step 6.4.14: WHEN the security compensatory measures are in place for opening the Refueling Purge Valves, THEN record the name of the Security Operations Section Leader in the Control Room Log.		Examinee determines from INITIAL CONDITIONS that security compensatory measures are in place and the Security Operations Section Leader's name was logged in the Control Room Log.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
12.	Step 6.4.15 (including sub-steps 6.4.15.1, 6.4.15.2, and 6.4.15.3) : IF the Radioactive Gaseous Release Permit specifies the use of only one supply and one exhaust fan, THEN perform the following:.....		The examinee marks these steps N/A.

SAT / UNSAT

Comments (required for UNSAT):

CAUTION prior to Step 6.4.16:

Starting the Containment Purge System when PCN-V118, Fuel Transfer Tube Canal Isolation, is open will affect the water level in both the Refueling Pool and the Spent Fuel Pool due to changes in Containment pressure.



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	STEP	CUE	STANDARD
15. *	Step 6.4.16: Place CPN-HS-1, Containment Purge Mode Selector, in the REFUEL PURGEposition.		Examinee places CPN-HS-1, Containment Purge Mode Selector, in the REFUEL PURGEposition.
			Examiner Note: The blue light for REFUEL PURGE will illuminate on CPN-HS-1.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
16. *	Step 6.4.17: Take CPA-HS-2, Cntmt Refuel Prg Upstr Isol Vlvs UV-2A/2B, to OPEN.	Examiner Note: Will need a Key to accomplish this step.	Examinee takes CPA-HS-2, Cntmt Refuel Prg Upstr Isol Vlvs UV-2A/2B, to OPEN.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
17.	Step 6.4.18: Check the open (red) indicating light for CPA-UV-2A and CPA-UV-2B is on.		Examinee checks the open (red) indicating light for CPA-UV-2A and CPA-UV-2B is on.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
18. *	Step 6.4.19: Take CPB-HS-3, Cntmt Refuel Prg Dwnstr Isol Vlvs UV-3A/3B, to OPEN.		Examinee takes CPB-HS-3, Cntmt Refuel Prg Dwnstr Isol Vlvs UV- 3A/3B, to OPEN.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
19.	Step 6.4.20: Check the open (red) indicating light for CPB-UV-3A and CPB- UV-3B is on.	INFORM CUE after step is completed: Another operator will complete the remainder of this procedure.	Examinee checks the open (red) indicating light for CPB-UV-3A and CPB-UV-3B is on. Examiner Note: The following lights will also change from red to green after CPB-UV-3A and CPB-UV-3B are open: <ul style="list-style-type: none">• REFUEL PURGE AHU IN/OUT DMPRS M02A&B/M05A&B• REFUEL PURGE AHU SUPPLY FAN A A01A• REFUEL PURGE AHU SUPPLY FAN B A01B• REFUEL PURGE EXHAUST FAN A J01A• REFUEL PURGE EXHAUST FAN A J01A
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



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APPLICANT

INITIAL CONDITIONS:

- Unit 1 is in Mode 5.
- The Containment has been vented.
- A Radioactive Gas Release Permit has been approved for using both supply and exhaust fans.
- HVAC has greased the fan motor bearings.
- The Security Operations Section leader has been notified and compensatory measures are in place for opening the Refueling Purge Valves. The Security Operations Section Leader's name has been recorded in the Control Room Log.
- 74ST-9SQ07, Radiation Monitoring System Shiftly Surveillance Test, is current for BOTH of the following:
 - ❖ RU-37
 - ❖ RU-38

INITIATING CUE:

- The CRS directs you to place the Containment Refueling Purge system in service per Section 6.4 of 40OP-9CP01.
- All Prerequisites have been completed.
- Section 6.4 has been completed through Step 6.4.3.

APPLICANT

Containment Purge System

40OP-9CP01

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- Mode 5
- N/A • Mode 6
- N/A • Defueled

6.4.1.4 The Instrument Air System is in service per 40OP-9IA01, Instrument Air System (IA).6.4.1.5 The Normal Chilled Water System is in service per 40OP-9WC01, Normal Chilled Water System (WC).6.4.1.6 The Blind Flange on CPA-UV-2A, Refuel Access Purge Up-strm Inlet Ctmt Isolation Valve, has been removed.6.4.1.7 The Blind Flange on CPB-UV-3B, Containment Building Refuel Purge Exhaust Duct Isolation Damper, has been removed.6.4.2 Initial Conditions6.4.2.1 A Radioactive Gaseous Release Permit has been approved for the purge per 74RM-9EF20, Gaseous Radioactive Release Permits and Offsite Dose Assessment.6.4.2.2 A REP has been issued if required.6.4.2.3 Appendix D - Containment Purge Valve Verification List, is complete.6.4.2.4 Appendix B - Refueling Purge Electrical Verification List, is complete.6.4.2.5 HVAC has been notified to evaluate the need to grease the fan motor bearings if the Refueling Purge Fans have not been in service since the last refueling outage.

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N/A 6.4.2.6 HVAC has checked for proper fan rotation if ONE of the following was performed:

N/A • 40OP-9TP01, Operational Support of Temporary Power for Train One, for CPN-J01A, Ctmt Bldg Refueling Purge Exhaust Fan A

N/A • 40OP-9TP02, Operational Support of Temporary Power for Train Two, for CPN-J01B, Ctmt Bldg Refueling Purge Exhaust Fan B

NOTE

✓ The phone extension for Security Operations Section Leader is 82-1715.

✓ 6.4.2.7 The Security Operations Section Leader has been notified that the Refueling Purge Valves are about to be opened, and that necessary compensatory measures are to be taken.

✓ 6.4.2.8 The SM/CRS/WCSRO has granted permission to manipulate ALL of the following components controlled by 40AC-0ZZ06, Locked Valve, Breaker and Component Control:

- ✓ • MCC Breaker PHA-M3516, Ctmt Refuel Purge Isol Valve CPA-UV-2A
- ✓ • MCC Breaker PHA-M3517, Ctmt Refuel Purge Isol Valve CPA-UV-2B
- ✓ • MCC Breaker PHB-M3622, Ctmt Refuel Purge Isol Valve CPB-UV-3A
- ✓ • MCC Breaker PHB-M3623, Ctmt Refuel Purge Isol Valve CPB-UV-3B

Signature

Supervisor
SM/CRS/WCSRO

Date

(today)

✓ 6.4.3 Initiate a Mode 4 Technical Specification Component Condition Record (TSCCR) to ensure the leak rate test required by SR 3.6.3.6, Leakage Rate Testing, is complete prior to entering Mode 4 per BOTH of the following:

- ✓ • 73ST-9CL06, Containment Ventilation Purge Isolation Valves (42 inch) Penetration 56
- ✓ • 73ST-9CL10, Containment Ventilation Purge Isolation Valves (42 inch) Penetration 57

 6.4.4 Unlock MCC Breaker PHA-M3516, Ctmt Refuel Purge Isol Valve CPA-UV-2A.

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- ___ 6.4.5 Close MCC Breaker PHA-M3516, Ctmt Refuel Purge Isol Valve CPA-UV-2A.
- ___ 6.4.6 Unlock MCC Breaker PHA-M3517, Ctmt Refuel Purge Isol Valve CPA-UV-2B.
- ___ 6.4.7 Close MCC Breaker PHA-M3517, Ctmt Refuel Purge Isol Valve CPA-UV-2B.
- ___ 6.4.8 Unlock MCC Breaker PHB-M3622, Ctmt Refuel Purge Isol Valve CPB-UV-3A.
- ___ 6.4.9 Close MCC Breaker PHB-M3622, Ctmt Refuel Purge Isol Valve CPB-UV-3A.
- ___ 6.4.10 Unlock MCC Breaker PHB-M3623, Ctmt Refuel Purge Isol Valve CPB-UV-3B.
- ___ 6.4.11 Close MCC Breaker PHB-M3623, Ctmt Refuel Purge Isol Valve CPB-UV-3B.
- ___ 6.4.12 Ensure the Instrument Air supply valve to BOTH of the following are open:
(Inside panel CPN-LAP-01)
 - ___ • CPN-HY-006A, Solenoid For Pneun Damper CPN-M02A
 - ___ • CPN-HY-006B, Solenoid For Pneun Damper CPN-M02B
- ___ 6.4.13 **IF** Containment integrity is set for core alterations or irradiated fuel movement in the Containment,
THEN direct the Radiation Monitoring Technician to ensure 74ST-9SQ07, Radiation Monitoring System Shiftly Surveillance Test, is current for BOTH of the following:
 - ___ • RU-37
 - ___ • RU-38
- ___ 6.4.14 **WHEN** the security compensatory measures are in place for opening the Refueling Purge Valves,
THEN record the name of the Security Operations Section Leader in the Control Room Log.
- ___ 6.4.15 **IF** the Radioactive Gaseous Release Permit specifies the use of only one supply and one exhaust fan,
THEN perform the following:
 - ___ 6.4.15.1 Close the Instrument Air valve to ONE of the following:
(Inside panel CPN-LAP-01)
 - ___ • CPN-HY-006A, Solenoid For Pneun Damper CPN-M02A
 - ___ • CPN-HY-006B, Solenoid For Pneun Damper CPN-M02B

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___ 6.4.15.2 IF temporary power is installed to D-panel Breaker NHN-D26 52-19, Containment Refueling Purge Outlet Damper CPN-M05B, per 40OP-9TP02, Operational Support of Temporary Power for Train Two, **THEN perform** the following:

- ___ a. Ensure D-panel Breaker NHN-D26 52-19, Containment Refueling Purge Outlet Damper CPN-M05B, is open.
- ___ b. Ensure D-panel Breaker NHN-D25 52-08, Spare, is open.

___ 6.4.15.3 IF temporary power is NOT installed to D-panel Breaker NHN-D26 52-19, Containment Refueling Purge Outlet Damper CPN-M05B, per 40OP-9TP02, Operational Support of Temporary Power for Train Two, **THEN ensure** D-panel Breaker NHN-D26 52-19, Containment Refueling Purge Outlet Damper CPN-M05B, is open.

CAUTION

___ Starting the Containment Purge System when PCN-V118, Fuel Transfer Tube Canal Isolation, is open will affect the water level in both the Refueling Pool and the Spent Fuel Pool due to changes in Containment pressure.

___ 6.4.16 Place CPN-HS-1, Containment Purge Mode Selector, in the REFUEL PURGE position.

___ 6.4.17 Take CPA-HS-2, Cntmt Refuel Prg Upstr Isol Vlvs UV-2A/2B, to OPEN.

___ 6.4.18 Check the open (red) indicating light for CPA-UV-2A and CPA-UV-2B is on.

___ 6.4.19 Take CPB-HS-3, Cntmt Refuel Prg Dwnstr Isol Vlvs UV-3A/3B, to OPEN.

___ 6.4.20 Check the open (red) indicating light for CPB-UV-3A and CPB-UV-3B is on.

___ 6.4.21 Record the time that BOTH of the following were opened on the Radioactive Gaseous Release Permit:

- ___ • CPA-UV-2A/2B, Refuel Access Purge Up-strm Inlt Ctmt Isol
- ___ • CPB-UV-3A/3B, Refuel Access Purge Down-strm Outl Ctmt Isol

___ 6.4.22 Notify BOTH of the following of the start time for the release:

- ___ • Radiation Monitoring Technician
- ___ • Unit Radiation Protection

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NOTE

— Surveillance Requirement 3.3.8.1, Channel Check, is met by 74ST-9SQ07, Radiation Monitoring System Shiftly Surveillance Test.

- 6.4.23 IF Containment Refueling Purge will continue into the next shift, **THEN** notify the Radiation Monitoring Technician to ensure per 74ST-9SQ07, Radiation Monitoring System Shiftly Surveillance Test, is current.
- 6.4.24 IF RU-34, Containment Purge Ventilation Monitor, is running, **THEN** perform the following:
 - 6.4.24.1 Ensure CPB-V023, Isolation between Refueling Purge Duct/RU-34 Isolation Valve, is open.
 - 6.4.24.2 Ensure CPB-V024, PWR Access Purge Duct/RU34 Isolation Valve, is closed.

End of Section 6.4



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JPM BASIS INFORMATION

TASK:	0100010401 Operate the Pressurizer Pressure Control System						
TASK STANDARD:	Pressurizer pressure is reduced using Auxiliary Sprays to 2250 \pm 10 psia with pressurizer backup heaters turned off and proportional heaters re-energized						
K/A:	4.2027AA1.01		K/A RATING:	RO:	4.0	SRO:	3.9
10 CFR 55:	45(a)(5), 45(a)(6)						
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	10 minutes			
REFERENCES:	40AL-9RK4A, Panel B04A Alarm Responses, Rev. 43						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **Yes**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Larry Wilhelm Date: 6/18/2002

Revised By: Rusty Quick Date: 03/26/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



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1. SIMULATOR SETUP:

- IC#: 602
- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
-----------------------	-------------

- SPECIAL INSTRUCTIONS:
 1. IF IC-602 is used, reset to IC 602, THEN Go To Step 5 and lower RCS pressure to ~2262 psia.
 2. IF IC-602 is NOT used, reset to IC 10 (2% Power IC), GO TO RUN
 3. Run scenario file **2015 NRC S-5 and S-6.scn** from exam flash drive
 4. When Pressurizer Pressure is rising, THEN FREEZE the simulator.
 5. Provide INITIATING CUE

(Important to give the INITIATING CUE before going to RUN)

6. GO TO RUN

- REQUIRED CONDITIONS:
 - RCS Pressure rising slowly.
- SIMULATOR EVALUATION PRE-CHECK
 - ☐ Correct IC
 - ☐ Alarm Silence Off
 - ☐ Procedures available, page checked, and clean
 - ☐ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40AL-9RK4A, Panel B04A Alarm Responses, Rev. 43

3. JPM PERFORMANCE:

- REMOTE FUNCTIONS, MALFUNCTIONS, OVERRIDES, etc. **during** JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
N/A		



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TASK CONDITIONS**

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DO NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



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INITIAL CONDITIONS:

- Pressurizer Pressure is increasing.
- Alarm Window 4A01B has annunciated due to a failed Pressurizer Pressure Instrument.

INITIATING CUE:

- The CRS directs you to perform the actions per 40AL-9RK4A Window 4A01B and restore Pressurizer pressure to 2250 ± 10 psia.



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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



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JPM START TIME:

	STEP	CUE	STANDARD
1.	AUTOMATIC ACTION Step 1: Backup heaters turn on at 2200 psia.	Examiner Note: Examinee may start at the beginning (Page 255) of the ARP for PZR PRESS HI-LO. In this event, the examinee will proceed to Operator Action 3 and then transition to Page 261 of the ARP (Step 5 of this JPM). Examinee may also start at Page 261 (Step 5 of this JPM).	Examinee determines backup heaters are on.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
2. *	OPERATOR ACTION Step 1: Check BOTH of the following pressure instruments: <ul style="list-style-type: none"> RCN-PR-100, L) Pressure PT-100X RCN-PR-100, R) Pressure PT-100Y 		Examinee checks both 100X and 100Y. Examinee determines 100X has failed low.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
3.	OPERATOR ACTION Step 2: IF ONE of the following controlling channels is failed: <ul style="list-style-type: none"> • RCN-PR-100, L) Pressure PT-100X • RCN-PR-100, R) Pressure PT-100Y THEN place RCN-HS-100, Pressure Control Channel X/Y Selector, to the unaffected channel.		Examinee determines 100X has failed low. Examinee selects 100Y on the Pressure Control channel X/Y Selector (RCN-HS-100) Examiner Note: Although the controlling channel has failed, another malfunction prevents the operator action from being effective.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
4.	OPERATOR ACTION Step 3: IF actual Pressurizer pressure is rising due to a failed channel, THEN GO TO alarm window 4A01B, PZR PRESS HI-LO, for Pressurizer Pressure Hi, on page 261.	ALTERNATE PATH	Examinee determines goes to page 261 due to pressure rising.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
5.	AUTO ACTION Step 1: Deenergizes all heaters, only if controlling channel fails.		Examinee determines Pressurizer Pressure < 2383 psia. Examinee may deenergize all heaters at this point. Examiner Note: If the examinee deenergizes all heaters this will satisfy the critical step for step 8 of this JPM.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
6. *	OPERATOR ACTION Step 1: IF the SM/CRS determines a high pressure trip is impending at 2382 psia, THEN perform the following at the direction of the SM/CRS: <ul style="list-style-type: none"> • Trip the Reactor • GO TO 40EP-9EO01, Standard Post Trip Actions 		Examinee determines Pressurizer Pressure < 2383 psia. Examiner Note: TERMINATE JPM, IF REACTOR IS TRIPPED. JPM would be UNSAT. (Only critical if Reactor is tripped)
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
7.	OPERATOR ACTION Step 2: Check BOTH of the following <ul style="list-style-type: none"> • RCN-PR-100, L) Pressure PT-100X • RCN-PR-100, R) Pressure PT-100Y 		Examinee determines actual high pressure condition exists.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
8.	OPERATOR ACTION Step 3: IF ONE of the following controlling channels is failed: <ul style="list-style-type: none"> • RCN-PR-100, L) Pressure PT-100X • RCN-PR-100, R) Pressure PT-100Y THEN place RCN-HS-100, Pressure Control Channel X/Y Selector, to the unaffected channel.		Examinee determines CH "X" has failed and selects channel 'Y' using handswitch RCN-HS-100 on B04. This was probably done in the previous section of the procedure Examiner Note: This action was likely completed in the previous section of the procedure. Although the controlling channel has failed, another malfunction prevents the operator action from being effective.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
9.	OPERATOR ACTION Step 4: IF actual Pressurizer pressure is lowering due to a failed channel, THEN GO TO alarm window 4A01B, PZR PRESS HI-LO, for Pressurizer Pressure Ch X /Y Lo, on page 255.		Examinee N/As this step as actual pressure is rising.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
10.	OPERATOR ACTION Step 5.1 AND 5.2: <ul style="list-style-type: none"> Place RCN-PIC-100, Pressure Spray Control, in MANUAL Adjust RCN-PIC-100, Pressure Spray Control, output between 33.5% and 50% to open the Pressurizer main spray valves. 		Examinee attempts to open Main Spray valves using RCN-PIC-100. Examiner Note: Controller PIC-100 has failed, and the Main Spray valves will not open.

SAT / UNSAT

Comments (required for UNSAT):



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	STEP	CUE	STANDARD
11.	OPERATOR ACTION Step 5.1 AND 5.2: <ul style="list-style-type: none">Place RCN-PIC-100, Pressure Spray Control, in MANUALAdjust RCN-PIC-100, Pressure Spray Control, output between 33.5% and 50% to open the Pressurizer main spray valves.		Examinee attempts to open Main Spray valves using RCN-PIC-100.
			Examiner Note: Controller PIC-100 is failed and the Main Spray valves will not open.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
12.	OPERATOR ACTION Step 5.3: IF BOTH of the following conditions exist: <ul style="list-style-type: none"> Manual operation of RCN-PIC-100, Pressure Spray Control, does NOT reduce the high pressure condition The SM/CRS directs manual selection of a Pressurizer Spray Control valve THEN place RCN-HS-100-10, Spray Valve Selector, to ONE of the following positions: <ul style="list-style-type: none"> RC-100E RC-100F Both 	INFORM CUE: The CRS does <u>NOT</u> direct you to change the spray valve selection.	Examinee N/As this step
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
13.	OPERATOR ACTION Step 5.4: IF BOTH of the following conditions exist: <ul style="list-style-type: none"> Manual operation of RCN-PIC-100, Pressure Spray Control, does NOT reduce the high pressure condition The SM/CRS directs manual control of a Pressurizer Spray Control valve using RCN-PIK-100, Pressure Spray Control THEN perform the following: <ul style="list-style-type: none"> Place RCN-PIK-100, Pressure Spray Control, in Manual. Adjust RCN-PIK-100, Pressure Spray Control, to control Pressurizer pressure. 		The examinee places RCN-PIK-100 in MANUAL, adjusts the output up and determines spray valves did not open.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
14. *	OPERATOR ACTION Step 5.5: IF manual operation of the Pressurizer main spray valves does NOT lower Pressurizer pressure, THEN open ONE of the following Pressurizer auxiliary spray valves: <ul style="list-style-type: none"> CHA-HS-205, Pressurizer Aux Spray Vlv CHB-HS-203, Pressurizer Aux Spray Vlv. 		Examinee using CHA-HS-05 and/or CHB-HS-203 on B03 to reduce RCS pressure to 2250 ± 10 psia
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
15.	OPERATOR ACTION Step 5.6: IF Pressurizer auxiliary spray valves are operated, THEN REFER TO 40ST-9RC01, RCS and Pressurizer Heatup and Cooldown Rates.	INFORM CUE: Another operator will address 40ST-9RC01.	Examinee initials step and continues into procedures.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
16.	OPERATOR ACTION Step 6: REFER TO LCO 3.4.1, RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits.	INFORM CUE: The CRS will address the LCO.	Examinee initials step and continues into procedures.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
17.	OPERATOR ACTION Step 7: IF the SM/CRS determines a Reactor trip is NOT required, THEN minimize rate of Unit load changes to facilitate pressure control until the cause is determined and corrected.	IF REQUESTED CUE: The CRS has determined a Reactor Trip is NOT required and will minimize load changes.	Examinee informs CRS to minimize rate of load changes to facilitate pressure control, until the cause is determined and corrected
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
18. *	<p>OPERATOR ACTION Step 8:</p> <p>IF Pressurizer backup heaters are energized, THEN take ALL of the following heaters to OFF:</p> <ul style="list-style-type: none"> • RCN-HS-100-6, Backup Heaters Bank • RCN-HS-100-7, Backup Heaters Bank • RCN-HS-100-8, Backup Heaters Bank • RCN-HS-100-9, Backup Heaters Bank • RCA-HS-100-4, Backup Heaters Bank • RCB-HS-100-5, Backup Heaters Bank 		<p>Examinee deenergizes all backup heater by taking the following handswitches to OFF:</p> <ul style="list-style-type: none"> • RCN-HS-100-6, Backup Heaters Bank • RCN-HS-100-7, Backup Heaters Bank • RCN-HS-100-8, Backup Heaters Bank • RCN-HS-100-9, Backup Heaters Bank • RCA-HS-100-4, Backup Heaters Bank • RCB-HS-100-5, Backup Heaters Bank
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



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	STEP	CUE	STANDARD
19. *	<p>OPERATOR ACTION Step 9:</p> <p>IF ANY of the following Pressurizer proportional heater handswitches indicate a tripped condition:</p> <ul style="list-style-type: none">• RCN-HS-100-1, Proportional Heaters Bank• RCN-HS-100-2, Proportional Heaters Bank <p>THEN take BOTH of the following Pressurizer proportional heater handswitches to ON:</p> <ul style="list-style-type: none">• RCN-HS-100-1, Proportional Heaters Bank• RCN-HS-100-2, Proportional Heaters Bank		<p>Examinee energizes the proportional heater by taking the following switches to ON:</p> <ul style="list-style-type: none">• RCN-HS-100-1, Proportional Heaters Bank• RCN-HS-100-2, Proportional Heaters Bank. <p>Examiner Note: This step is only critical if the examinee deenergized the proportional heaters from the AUTO Action step (Step 1 of this JPM).</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			

JPM STOP TIME:

NORMAL TERMINATION POINT



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APPLICANT

INITIAL CONDITIONS:

- Pressurizer Pressure is increasing.
- Alarm Window 4A01B has annunciated due to a failed Pressurizer Pressure Instrument.

INITIATING CUE:

- The CRS directs you to perform the actions per 40AL-9RK4A Window 4A01B and restore Pressurizer pressure to 2250 \pm 10 psia.

APPLICANT

Panel B04A Alarm Responses

40AL-9RK4A

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Alarm Index

Pressurizer Pressure High Low

4A01B

**PZR
PRESS
HI-LO**

Point ID	Description	Page
RCPS100X	Pressurizer Pressure Ch X Lo	255
RCPS100Y	Pressurizer Pressure Ch Y Lo	
RCPS100H	Pressurizer Pressure Hi	261

4A01B

Panel B04A Alarm Responses

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Response Section

Pressurizer Pressure High Low

4A01B**PZR
PRESS
HI-LO**

Point ID	Description	Setpoint
RCPS100X	Pressurizer Pressure Ch X Lo	2160 psia
RCPS100Y	Pressurizer Pressure Ch Y Lo	2160 psia

AUTOMATIC ACTION

- Backup heaters turn on at 2200 psia

OPERATOR ACTIONS

- ___ 1. Check BOTH of the following pressure instruments:
 - ___ • RCN-PR-100, L) Pressure PT-100X
 - ___ • RCN-PR-100, R) Pressure PT-100Y
- ___ 2. **IF** ONE of the following controlling channels is failed:
 - ___ • RCN-PR-100, L) Pressure PT-100X
 - ___ • RCN-PR-100, R) Pressure PT-100Y

THEN place RCN-HS-100, Pressure Control Channel X/Y Selector, to the unaffected channel.
- ___ 3. **IF** actual Pressurizer pressure is rising due to a failed channel,
THEN GO TO alarm window 4A01B, PZR PRESS HI-LO, for Pressurizer Pressure Hi, on page 261.

4A01B

Panel B04A Alarm Responses

40AL-9RK4A

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___ 4. **IF** BOTH of the following are failed low:

- ___ • RCN-PR-100, L) Pressure PT-100X
- ___ • RCN-PR-100, R) Pressure PT-100Y

THEN perform the following:

___ 4.1 Place BOTH of the following controllers in MANUAL:

- ___ • RCN-PIK-100, Pressure Spray Control
- ___ • RCN-PIC-100, Pressure Master Control

___ 4.2 **IF** Pressurizer pressure is NOT at 2250 psia,
THEN adjust RCN-PIC-100, Pressure Master Control, to stabilize Pressurizer pressure to 2250 psia.

___ 4.3 Place ALL of the following Pressurizer backup heater handswitches to PULL-TO-LOCK:

- ___ • RCN-HS-100-6, Backup Heaters Bank
- ___ • RCN-HS-100-7, Backup Heaters Bank
- ___ • RCN-HS-100-8, Backup Heaters Bank
- ___ • RCN-HS-100-9, Backup Heaters Bank
- ___ • RCA-HS-100-4, Backup Heaters Bank
- ___ • RCB-HS-100-5, Backup Heaters Bank

___ 4.4 **IF** BOTH of the following conditions exist:

- ___ • Pressurizer pressure is approaching 2383 psia
- ___ • The SM/CRS determines Pressurizer pressure will reach 2383 psia

THEN perform the following at the direction of the SM/CRS:

- ___ 4.4.1 Trip the Reactor.
- ___ 4.4.2 GO TO 40EP-9EO01, Standard Post Trip Actions.



Panel B04A Alarm Responses

40AL-9RK4A

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___ 5. **IF** ANY of the following Pressurizer spray valves are open:

- ___ • RCE-PV-100E, Pressurizer Spray Control Valve from RCS Loop 1A
- ___ • RCE-PV-100F, Pressurizer Spray Control Valve from RCS Loop 1B

THEN perform the following:

___ 5.1 **IF** ONE of the following Pressurizer spray valves is the cause for Pressurizer low pressure:

- ___ • RCE-PV-100E, Pressurizer Spray Control Valve from RCS Loop 1A
- ___ • RCE-PV-100F, Pressurizer Spray Control Valve from RCS Loop 1B

THEN place RCN-HS-100-10, Spray Valve Selector, to the unaffected Pressurizer spray valve.

___ 5.2 **IF** BOTH of the following Pressurizer spray valves are the cause for the Pressurizer low pressure:

- ___ • RCE-PV-100E, Pressurizer Spray Control Valve from RCS Loop 1A
- ___ • RCE-PV-100F, Pressurizer Spray Control Valve from RCS Loop 1B

THEN perform the following:

___ 5.2.1 Place RCN-PIK-100, Pressure Spray Control, in MANUAL.

___ 5.2.2 Adjust RCN-PIK-100, Pressure Spray Control, output to minimum.

___ 5.3 **IF** ANY of the following will NOT close following attempts to close the open Pressurizer spray valve:

- ___ • RCE-PV-100E, Pressurizer Spray Control Valve from RCS Loop 1A
- ___ • RCE-PV-100F, Pressurizer Spray Control Valve from RCS Loop 1B

THEN perform the following:

___ 5.3.1 Trip the Reactor.

___ 5.3.2 Trip all four RCPs.

___ 5.3.3 GO TO 40EP-9EO01, Standard Post Trip Actions.

Panel B04A Alarm Responses

40AL-9RK4A

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- ___ 6. **IF** ANY of the following Auxiliary Spray valves are NOT closed:
 - ___ • CHA-HV-205, Pressurizer Aux Spray Control Valve
 - ___ • CHB-HV-203, Pressurizer Aux Spray Control Valve**THEN** take BOTH of the following handswitches to CLOSE:
 - ___ • CHA-HS-205, Pressurizer Aux Spray Vlv
 - ___ • CHB-HS-203, Pressurizer Aux Spray Vlv
- ___ 7. Energize any Pressurizer backup heaters at direction of the SM/CRS using ANY of the following handswitches:
 - ___ • RCN-HS-100-6, Backup Heaters Bank
 - ___ • RCN-HS-100-7, Backup Heaters Bank
 - ___ • RCN-HS-100-8, Backup Heaters Bank
 - ___ • RCN-HS-100-9, Backup Heaters Bank
 - ___ • RCA-HS-100-4, Backup Heaters Bank
 - ___ • RCB-HS-100-5, Backup Heaters Bank
- ___ 8. **IF** ANY of the following Pressurizer proportional heater handswitches indicate the tripped condition:
 - ___ • RCN-HS-100-1, Proportional Heaters Bank
 - ___ • RCN-HS-100-2, Proportional Heaters Bank**THEN** take BOTH of the following Pressurizer proportional heater handswitches to ON:
 - ___ • RCN-HS-100-1, Proportional Heaters Bank
 - ___ • RCN-HS-100-2, Proportional Heaters Bank
- ___ 9. REFER TO LCO 3.4.1, RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits.
- ___ 10. Check the ability to maintain Pressurizer pressure with the available Pressurizer heaters.

Panel B04A Alarm Responses

40AL-9RK4A

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- ___ 11. Monitor BOTH of the following for indications of a possible RCS leak:
- ___ • RCA-LI-110X, Level Control Channel X
 - ___ • RCB-LI-110Y, Level Control Channel Y
- ___ 12. **IF** a Reactor trip is NOT required,
THEN minimize rate of Unit load changes to facilitate pressure control until the cause is determined and corrected.
- ___ 13. **IF** BOTH of the following conditions exist:
- ___ • One Pressurizer main spray valve was selected for service
 - ___ • Both Pressurizer main spray valves are functional
- THEN** place RCN-HS-100, Pressure Control Channel X/Y Selector, to BOTH.

PROBABLE CAUSES

- Failure of instrument loop RCN-PT-100X, Pressurizer Press Control System Press Transmitter
- Failure of instrument loop RCN-PT-100Y, Pressurizer Press Control System Press Transmitter
- Loss of instrument power to instrument loop RCN-PT-100X, Pressurizer Press Control System Press Transmitter
- Loss of instrument power to instrument loop RCN-PT-100Y, Pressurizer Press Control System Press Transmitter
- Failed open RCE-PV-100E, Pressurizer Spray Control Valve from RCS Loop 1A
- Failed open RCE-PV-100F, Pressurizer Spray Control Valve from RCS Loop 1B
- Failed open CHA-HV-205, Pressurizer Aux Spray Control Valve
- Failed open CHB-HV-203, Pressurizer Aux Spray Control Valve

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REFERENCES

- Annunciator Cabinet: RKN-C02, MI Card: 5-T22-018A (for RCPS100X LED is off when in alarm)
- Annunciator Cabinet: RKN-C02, MI Card: 5-T22-018B (for RCPS100Y LED is off when in alarm)
- 40EP-9EO01, Standard Post Trip Actions

Panel B04A Alarm Responses

40AL-9RK4A

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Response Section

Pressurizer Pressure High Low

4A01B**PZR
PRESS
HI-LO**

Point ID	Description	Setpoint
RCPS100H	Pressurizer Pressure Hi	2285 psia

AUTOMATIC ACTION

- De-energizes all heaters, only if controlling channel fails

OPERATOR ACTIONS

- ___ 1. **IF** the SM/CRS determines a high pressure trip is impending at 2382 psia, **THEN** perform the following at the direction of the SM/CRS:
 - ___ 1.1 Trip the Reactor.
 - ___ 1.2 GO TO 40EP-9EO01, Standard Post Trip Actions
- ___ 2. Check BOTH of the following:
 - ___ • RCN-PR-100, L) Pressure PT-100X
 - ___ • RCN-PR-100, R) Pressure PT-100Y
- ___ 3. **IF** ONE of the following controlling channels is failed:
 - ___ • RCN-PR-100, L) Pressure PT-100X
 - ___ • RCN-PR-100, R) Pressure PT-100Y

THEN place RCN-HS-100, Pressure Control Channel X/Y Selector, to the unaffected channel.
- ___ 4. **IF** actual Pressurizer pressure is lowering due to a failed channel, **THEN** GO TO alarm window 4A01B, PZR PRESS HI-LO, for Pressurizer Pressure Ch X/Y Lo, on page 255.

4A01B

Panel B04A Alarm Responses

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___ 5. Perform the following to manually control Pressurizer pressure to 2250 psia:

___ 5.1 Place RCN-PIC-100, Pressure Spray Control, in MANUAL.

___ 5.2 Adjust RCN-PIC-100, Pressure Spray Control, output between 33.5% and 50% to open the Pressurizer main spray valves.

___ 5.3 **IF** BOTH of the following conditions exist:

- ___ • Manual operation of RCN-PIC-100, Pressure Spray Control, does NOT reduce the high pressure condition
- ___ • The SM/CRS directs manual selection of a Pressurizer Spray Control valve

THEN place RCN-HS-100-10, Spray Valve Selector, to ONE of the following positions:

- ___ • RC-100E
- ___ • RC-100F
- ___ • Both

___ 5.4 **IF** BOTH of the following conditions exist:

- ___ • Manual operation of RCN-PIC-100, Pressure Spray Control, does NOT reduce the high pressure condition
- ___ • The SM/CRS directs manual control of a Pressurizer Spray Control valve using RCN-PIK-100, Pressure Spray Control

THEN perform the following:

___ 5.4.1 Place RCN-PIK-100, Pressure Spray Control, in Manual.

___ 5.4.2 Adjust RCN-PIK-100, Pressure Spray Control, to control Pressurizer pressure.

___ 5.5 **IF** manual operation of the Pressurizer main spray valves does NOT lower Pressurizer pressure,

THEN open ONE of the following Pressurizer auxiliary spray valves:

- ___ • CHA-HS-205, Pressurizer Aux Spray Vlv
- ___ • CHB-HS-203, Pressurizer Aux Spray Vlv

Panel B04A Alarm Responses

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___ 5.6 **IF** Pressurizer auxiliary spray valves are operated,
THEN REFER TO 40ST-9RC01, RCS and Pressurizer Heatup and Cooldown Rates.

___ 6. REFER TO LCO 3.4.1, RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits.

___ 7. **IF** the SM/CRS determines a Reactor trip is NOT required,
THEN minimize rate of Unit load changes to facilitate pressure control until the cause is determined and corrected.

___ 8. **IF** Pressurizer backup heaters are energized,
THEN take ALL of the following heaters to OFF:

___ • RCN-HS-100-6, Backup Heaters Bank

___ • RCN-HS-100-7, Backup Heaters Bank

___ • RCN-HS-100-8, Backup Heaters Bank

___ • RCN-HS-100-9, Backup Heaters Bank

___ • RCA-HS-100-4, Backup Heaters Bank

___ • RCB-HS-100-5, Backup Heaters Bank

___ 9. **IF** ANY of the following Pressurizer proportional heater handswitches indicate a tripped condition:

___ • RCN-HS-100-1, Proportional Heaters Bank

___ • RCN-HS-100-2, Proportional Heaters Bank

THEN take BOTH of the following Pressurizer proportional heater handswitches to ON:

___ • RCN-HS-100-1, Proportional Heaters Bank

___ • RCN-HS-100-2, Proportional Heaters Bank

Panel B04A Alarm Responses

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PROBABLE CAUSES

- Failure of instrument loop RCN-PT-100X, Pressurizer Press Control System Press Transmitter
- Failure of instrument loop RCN-PT-100Y, Pressurizer Press Control System Press Transmitter
- Failed closed RCE-PV-100E, Pressurizer Spray Control Valve from RCS Loop 1A
- Failed closed RCE-PV-100F, Pressurizer Spray Control Valve from RCS Loop 1B
- Failed closed CHA-HV-205, Pressurizer Aux Spray Control Valve
- Failed closed CHB-HV-203, Pressurizer Aux Spray Control Valve

REFERENCES

- Annunciator Cabinet: RKN-C02, MI Card: 5-T22-017B (LED is off when in alarm)
- 40EP-9EO01, Standard Post Trip Actions
- 40ST-9RC01, RCS and Pressurizer Heatup and Cooldown Rates
- 0x-J-RCE-0060, Instrument Loop Wiring Diagram Reactor Coolant System



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JPM BASIS INFORMATION

TASK:	1250310201 Respond to an Inadvertent MSIS							
TASK STANDARD:	MSIS Actuation has been reset							
K/A:	3.2 013 A4.02			K/A RATING:	RO:	4.3	SRO:	4.4
10 CFR 55:	45(a)(5), 45(a)(8)							
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	10 minutes				
REFERENCES:	40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations, Rev 19							
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER			

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **No**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Larry Burton Date: 10/27/2011

Revised By: Rusty Quick Date: 03/30/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



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1. SIMULATOR SETUP:

1. IC#: 602

2. SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION

• SPECIAL INSTRUCTIONS:

1. **IF** IC602 is used, reset to **IC 602**, GO TORUN, acknowledge alarms, **THEN** Go To Step 4
2. **IF** IC 602 is **NOT** used, reset to IC 10 (2% power IC), GO TORUN
3. Bypass Channel C SG#1 HI LEVEL TRIP at the PPS Cabinets
4. Run scenario file **2015 NRC S-5 and S-6.scn** from exam flash drive.
5. Override the MSIVs and open all 4 MSIVs.
6. Override the Downcomer Isolation Valves and open all 4 Downcomer Isolation Valves.
7. Provide **INITIATING CUE**
8. GO TORUN

• REQUIRED CONDITIONS:

1. MISIS Actuated
2. MSIVs overridden and open
3. Downcomer Isolation Valves overridden and open
4. Channel C Hi SG 1 level in bypass
5. Channel A Hi SG 1 level tripped

• SIMULATOR EVALUATION PRE-CHECK

- ☐ Correct IC
- ☐ Alarm Silence Off
- ☐ Procedures available, page checked, and clean
- ☐ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations, Rev 19

NOTE: This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- REMOTE FUNCTIONS, MALFUNCTIONS, OVERRIDES, etc. during JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
None		



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TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY,DO NOT OPERATE**any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DONOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



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INITIAL CONDITIONS:

- Unit 1 is at approximately 2% power.
- An inadvertent MSIS has occurred due to a power supply failure.
- Channel C Hi SG level is in bypass.
- The CRS has implemented 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations.
- The faulted power supply has been replaced.

INITIATING CUE:

- The CRS directs you to reset MSIS, in accordance with appendix B of 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations.



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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



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JPM START TIME:

	STEP	CUE	STANDARD
1.	Step 1 of Appendix B: Enter Appendix Entry Time and Date		Examinee enters appendix entry time and date.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
2.	Step 2 of Appendix B: Enter actuation(s) to bereset:		Examinee enters MSIS in the space provided.
SAT / UNSAT Comments (required for UNSAT):			

Notes before step 3:

- Overriding equipment disables automatic ESFAS operation of the equipment. Depending on plant conditions, this action may make the equipment inoperable.
- The HPSI, LPSI and CS pump minimum recirculation flow provides sufficient heat removal for only one hour of pump operation.



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	STEP	CUE	STANDARD
3.	Step 3 of Appendix B: IF the PPS-ESFAS actuation was caused by failure to reset the SG or PZR Pressure variable setpoints during a controlled cooldown, THEN perform the following:		Examinee NAs step based on cue provided.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
4.	Step 4 of Appendix B: Check the Bistable Trip Lamps at the PPS Remote Operators Module (B05) for the affected PPS-ESFAS actuation input parameters on all PPS Channels satisfy ONE of the following <ul style="list-style-type: none"> • NOT lit • Bypassed 		Examinee determines that the “A” train SG 1 level HI Bistable trip lamp is lit.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
5. *	Contingency Step 4.1: a. Reset the affected Bistable Trip Lamps at the PPS Remote Operators Module (B05).		Examinee resets the “A” channel Bistable Trip Lamp on B05.

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
6.	Step 5 of appendix B: Check the affected PPS-ESFAS actuation Initiation Relay lamps are illuminated at the PPS remote Operators Module (B05) on all PPS Channels.		Examinee determines that the “A” train MSIS initiation relay lamp is not lit.

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
7. *	Contingency Step 5.2.a Obtain the PPS Initiation Reset key for the affected Train.		Examinee obtains the key for channel “A”.

SAT / UNSAT
Comments (required for UNSAT):



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	STEP	CUE	STANDARD
8. *	Contingency Step 5.2.b: Unlock the affected Initiation Path Reset Train (PPS Cabinets).		Examinee unlocks the Initiation Path Reset Train on channel "A".
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
9. *	Contingency Step 5.2.c: Reset the affected Initiation Path by depressing the appropriate Initiation Path Reset pushbutton (PPS Cabinets).		Examinee resets the affected Initiation Path by depressing the appropriate (MSIS) Initiation Path Reset pushbutton (PPS Cabinets).
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
10.	Contingency Step 5.2.d: Lock the Initiation Path Reset Train (PPS Cabinets).		Examinee locks the Initiation Path Reset Train (PPS Cabinets).
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
11.	Contingency Step 5.2.e: Remove the PPS Initiation Reset key.		Examinee removes the PPS Initiation Reset key.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
12.	Contingency Step 5.2.f: Check the affected Initiation Signal lamps are illuminated for the affected PPS channels (On status panels above PPS Cabinets).		Examinee checks the affected Initiation Signal lamps are illuminated for the affected PPS channels (On status panels above PPS Cabinets).
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
13.	Step 6 of appendix B: Check the actuated PPS-ESFAS leg 1-3 and leg 2-4 Actuation Signal lamps are illuminated for PPS Train A and Train B Actuation Signals (On status panels above PPS Cabinet A, SBAC01 and PPS Cabinet B, SBBC01).		Examinee determines that the “A” train MSIS signal lamps are not illuminated.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
14. *	Contingency Step 6.1: Perform the following for the affected Train(s): <ul style="list-style-type: none"> a. Press the LOCKOUT RESET pushbutton(s) for the affected PPS-ESFAS actuation(s) (Aux Relay Cabinets Bay 6 & 7). b. Check both red “ON” lamps are illuminated for the affected PPS-ESFASactuation (Aux Relay Cabinets Bay 6 & 7). 	After this step is complete: Information Cue: Another operator will complete this appendix.	Examinee performs the following: <ul style="list-style-type: none"> a. Presses the LOCKOUT RESET pushbutton(s) for the affected PPS-ESFAS actuation(s) (Aux Relay Cabinets Bay 6 & 7). b. Checks both red “ON” lamps are illuminated for the affected PPS-ESFASactuation (Aux Relay Cabinets Bay 6 & 7). Examiner Note: Pressing either pushbutton S64A or S74A will reset the MSIS LOCKOUT.
SAT / UNSAT Comments (required for UNSAT):			



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JPM STOP TIME:

NORMAL TERMINATION POINT



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APPLICANT

INITIAL CONDITIONS:

- Unit 1 is at approximately 2% power.
- An inadvertent MSIS has occurred due to a power supply failure.
- Channel C Hi SG level is in bypass.
- The CRS has implemented 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations.
- The faulted power supply has been replaced.

INITIATING CUE:

- The CRS directs you to reset MSIS, in accordance with Appendix B of 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations.

APPLICANT

Appendix B, PPS-ESFAS Reset

INSTRUCTIONS

CONTINGENCY ACTIONS

- ____ 1. Enter Appendix Entry Time
and Date:

- ____ 2. Enter actuation(s) to be
reset:

Appendix B, PPS-ESFAS Reset

INSTRUCTIONS

CONTINGENCY ACTIONS

NOTE

Overriding equipment disables automatic ESFAS operation of the equipment.
Depending on plant conditions, this action may make the equipment inoperable.

NOTE

The HPSI, LPSI and CS Pump minimum recirculation flow provides sufficient heat removal for only one hour of pump operation.

- ___ 3. **IF** the PPS-ESFAS actuation was caused by failure to reset the SG or PZR Pressure variable setpoints during a controlled cooldown,
THEN perform the following:
- a. Direct I&C to clear the affected trip signals.
 - b. Evaluate the need to override and position PPS-ESFAS actuated equipment.
REFER TO the appropriate attachment in Appendix C, PPS-ESFAS Check, for a list of actuated equipment.
 - c. Override and position equipment as needed.
 - d. **WHEN** the trip signals are cleared,
THEN continue with this appendix.

Appendix B, PPS-ESFAS Reset

INSTRUCTIONS

- ___4. Check the Bistable Trip Lamps at the PPS Remote Operators Module (B05) for the affected PPS-ESFAS actuation input parameters on all PPS Channels satisfy **ONE** of the following.

- **NOT** lit
- Bypassed

CONTINGENCY ACTIONS

- ___ 4.1 Perform the following for any tripped input parameter:
- a. Reset the affected Bistable Trip Lamps at the PPS Remote Operators Module (B05).
 - b. **IF** the trip light will **NOT** reset, **AND ANY** parameter is tripped on two or more channels, **THEN GO TO** step 7.1 of this appendix.

Appendix B, PPS-ESFAS Reset

INSTRUCTIONS

- ___ 5. Check the affected PPS-ESFAS actuation Initiation Relay lamps are illuminated at the PPS Remote Operators Module (B05) on all PPS Channels.

CONTINGENCY ACTIONS

- ___ 5.1 **IF** the **AFAS 1 or 2** Initiation Relay lamps are **NOT** lit, **THEN GO TO** step 7.1 of this appendix.
- ___ 5.2 Perform the following for any de-energized PPS-ESFAS Initiation Path(s):
- Obtain the PPS Initiation Reset key for the affected Train.
 - Unlock the affected Initiation Path Reset Train (PPS Cabinets).
 - Reset the affected Initiation Path by depressing the appropriate Initiation Path Reset pushbutton (PPS Cabinets).
 - Lock the Initiation Path Reset Train (PPS Cabinets).
 - Remove the PPS Initiation Reset key.
 - Check the affected Initiation Signal lamps are illuminated for the affected PPS channels (On status panels above PPS Cabinets).
 - IF** the Initiation Path will **NOT** reset, **THEN GO TO** step 7.1 of this appendix.

Appendix B, PPS-ESFAS Reset

INSTRUCTIONS

- ___ 6. Check the actuated PPS-ESFAS leg 1-3 and leg 2-4 Actuation Signal lamps are illuminated for PPS Train A and Train B Actuation Signals (On status panels above PPS Cabinet A, SBAC01 and PPS Cabinet B, SBBC01).

- ___ 7. **IF** the PPS-ESFAS actuation is reset,
THEN GO TO ONE of the following steps of this procedure as appropriate:

- Section 3.0, AFAS, step 10.
- Section 4.0, CIAS, step 9.
- Section 5.0, CSAS, step 22.
- Section 6.0, MSIS, step 13.
- Section 7.0, RAS, step 9.
- Section 8.0, SIAS OR SIAS/CIAS, step 16.

CONTINGENCY ACTIONS

- ___ 6.1 Perform the following for the affected Train(s):
- a. Press the LOCKOUT RESET pushbutton(s) for the affected PPS-ESFAS actuation(s) (Aux Relay Cabinets Bay 6 & 7).
 - b. Check both red "ON" lamps are illuminated for the affected PPS-ESFAS actuation (Aux Relay Cabinets Bay 6 & 7).
- ___ 7.1 **IF** the PPS-ESFAS actuation will **NOT** reset,
THEN perform the following:
- a. Evaluate the need to override and position PPS-ESFAS actuated equipment. REFER TO the appropriate attachment in Appendix C, PPS-ESFAS Check, for a list of actuated equipment.
 - b. Override and position equipment as needed.

End of Appendix



RO SIMULATOR JPM S7
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JPM BASIS INFORMATION

TASK:	1140010401, Lineup the Steam Bypass Control System for Normal Operation						
TASK STANDARD:	THE SBCS is reconnected. The "NOT IN OPERATE" lights are extinguished; SBCS ABNORMAL (window 6A16A) and SBCS COND INTLK (window 6A16B) alarms are reset.						
K/A:	3.4 041 A4.08		K/A RATING:	RO:	3.0	SRO:	3.1
10 CFR 55:	45(a)(5), 45(a)(8)						
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	10 minutes			
REFERENCES:	40OP-9SF05, Operation of Steam Bypass Control System, Revision 25						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **No**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: John Dedon Date: 11/18/2003

Revised By: Rusty Quick Date: 03/26/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



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1. SIMULATOR SETUP:

- IC#: 603
- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

- SPECIAL INSTRUCTIONS:
 1. IF IC603 is used, reset to **IC 603**, GO TORUN, and acknowledge alarms
 2. Provide **INITIATING CUE**
 3. GO TORUN
 4. To run this as a stand-alone JPM or in the event that the scenario file/IC is unavailable:
 - a. Reset to IC#: 20
 - b. GOTO RUN
 - c. Remove the Reactor Power Cutback System from service per 40OP-9SF04.
 - d. Remove SBCS from service for Maintenance per 40OP-9SF05, Section 6.13.
 - e. Place the System Mode Switch in "TEST" on the SBCS Panel.

NOTE: The following RED LEDs will be lit: "Emergency OFF", both "Condenser Interlock" lights, both "Not in Operate" lights, and AMI.

- f. Silence/Acknowledge Alarms.
 - g. GOTO FREEZE
 - h. Give examinee **INITIATING CUE**
 - i. When examinee is ready, GOTO RUN
- REQUIRED CONDITIONS:
 1. SBCS not in service
 - SIMULATOR EVALUATION PRE-CHECK
 - ☐ Correct IC
 - ☐ Alarm Silence Off
 - ☐ Procedures available, page checked, and clean
 - ☐ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40OP-9SF05, Operation of Steam Bypass Control System, Revision 25. **NOTE:** This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- REMOTE FUNCTIONS, MALFUNCTIONS, OVERRIDES, etc. during JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
None		



**RO SIMULATOR JPM S7
PVNGS JOB PERFORMANCE MEASURE
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TASK CONDITIONS**

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DONOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



**RO SIMULATOR JPM S7
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- The Steam Bypass Control System has been disconnected at the SBCS Test Panel due to troubleshooting.
- The SBCS is now ready to be returned to service.

INITIATING CUE:

- The CRS directs you to perform Sections C.1 and C.2 of Appendix C of 40OP-9SF05, Operation of Steam Bypass Control System, to Reconnect and Reset the Steam Bypass Control System.



**RO SIMULATOR JPM S7
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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



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JPM START TIME:

	STEP	CUE	STANDARD
1.	STEP C.1.1: ANY of the following Prerequisites are met: <ul style="list-style-type: none">SFN-C03N, NSSS Control Systems Cabinet, System Mode Selector switch is not in OPERATE.At least one SFN-C03N, NSSS Control Systems Cabinet, NOT IN OPERATE light is ON.		Examinee determines both 'NOT IN OPERATE' lights are ON.
SAT / UNSAT Comments (required for UNSAT):			

Notes before step C.1.2:

NOTE

The following alarms are expected:

- SBCS ABNORMAL (6A16A)
- SBCS COND INTLK (6A16B)
- BOP/NSSS ANALOG INST CAB TRBL (7C15A)

CAUTION

Failure to press the EMERGENCY OFF pushbutton at SFN-C03N, NSSS Control Systems Cabinet, may result in a Quick Open signal when the System Mode Selection switch is placed to DISCONNECT.



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	STEP	CUE	STANDARD
2.	STEP C.1.2: Press the EMERGENCY OFF pushbutton at SFN-C03N, NSSS Control Systems Cabinet.		Examinee depresses the "EMERGENCY OFF" pushbutton. The red EMERGENCY OFF light was already illuminated.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
3.	STEP C.1.3: Check ALL of the following: <ul style="list-style-type: none"> • The EMERG OFF light at SFN-C03N, NSSS Control Systems Cabinet, is ON • SFN-C03Y, NSSS Control Systems Cabinet, Power Supply light (-15, +15) nest 4 is OFF • SFN-C03Y, NSSS Control Systems Cabinet, Power Supply light (-15, +15) nest 5 is OFF • SFN-C03Y, NSSS Control Systems Cabinet, Power Supply light (-15, +15) nest 7 is OFF 	INFORMATION CUE (after examinee checks EMERG OFF light ON): <ul style="list-style-type: none"> • SFN-C03Y, NSSS Control Systems Cabinet, Power Supply light (-15, +15) nest 4 is OFF • SFN-C03Y, NSSS Control Systems Cabinet, Power Supply light (-15, +15) nest 5 is OFF • SFN-C03Y, NSSS Control Systems Cabinet, Power Supply light (-15, +15) nest 7 is OFF 	Examinee checks EMERG OFF light lit at panel SFN-C03N. Examiner Note: The lights in panel SFN-C03Y are not modeled in the simulator.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
4. *	STEP C.1.4: Place the System Mode Selection switch at SFN-C03N, NSSS Control Systems Cabinet, to DISCONNECT.		Examinee places the System Mode Select switch in "DISCONNECT".

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
5. *	STEP C.1.5: Press the LIGHT AND TIMER TEST pushbutton on SFN-C03N, NSSS Control Systems Cabinet.		Examinee depresses and releases the LIGHT AND TIMER TEST pushbutton.

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
6.	STEP C.1.6: Check BOTH of the following lights are OFF: <ul style="list-style-type: none"> • NOT IN OPERATE (1) • NOT IN OPERATE (2) 		The examinee observes that the NOT IN OPERATE lights 1 and 2 extinguish.

SAT / UNSAT
Comments (required for UNSAT):



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	STEP	CUE	STANDARD
7.	STEP C.1.7: WHEN 30 seconds has elapsed since pressing the LIGHT AND TIMER TEST pushbutton, THEN check BOTH of the following lights are ON: <ul style="list-style-type: none"> • NOT IN OPERATE (1) • NOT IN OPERATE (2) 		The examinee observes that the NOT IN OPERATE lights 1 and 2 come back "ON" in 30 seconds.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
8. *	STEP C.1.8: Place the System Mode Selector switch at SFN-C03N, NSSS Control Systems Cabinet, to OPERATE.		Examinee places the System Mode Selection Switch in "OPERATE".
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
9.	STEP C.1.9: WHEN 30 seconds has elapsed since placing the System Mode Selector switch to OPERATE, THEN check BOTH of the following lights are OFF. <ul style="list-style-type: none"> • NOT IN OPERATE (1) • NOT IN OPERATE (2) 		Examinee observes that the NOT IN OPERATE lights 1 and 2 extinguish after 30 seconds.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
10.	STEP C.2.1: ALL of the following Prerequisites are met: <ul style="list-style-type: none"> • SFN-C03N, NSSS Control Systems Cabinet, System Mode Selector switch is in OPERATE • The NOT IN OPERATE (1) light at SFN-C03N, NSSS Control Systems Cabinet, is OFF • The NOT IN OPERATE (2) light at SFN-C03N, NSSS Control Systems Cabinet, is OFF 		Examinee determines prerequisites are met.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
11. *	STEP C.2.2: Ensure SGN-PIC-1010, Master Steam Bypass Control, is in the Manual mode.		Examinee places the SBCS Master Controller (SGN-PIC-1010) in "MANUAL".
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
12.	STEP C.2.3: Ensure SGN-PIC-1010, Master Steam Bypass Control, output is set to 0% demand.		Examinee ensures zero output on SBCS controller by pushing the slider to the left until the meter points to "0."
SAT / UNSAT Comments (required for UNSAT):			

NOTE before Step C.2.4

Performance of Step C.2.4 may cause the following alarm(s):

- SBCS ABNORMAL (6A16A)
- SBCS COND INTLK (6A16B)
- BOP/NSSS ANALOG INST CAB TRBL (7C15A)



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	STEP	CUE	STANDARD
13. *	STEP C.2.4: Take SGN-HS-1010, EMERGENCY OFF/RESET, to RESET.		Examinee places switch SGN-HS-1010 to "RESET" (spring return to neutral).

SAT / UNSAT
Comments (required for UNSAT):

Note before Step C.2.5

The red output indicator of SGN-PIC-1010, Master Control, may jump from 0% demand upon reset. This may result in TURB BYP DEMAND (4A12B) alarm.

	STEP	CUE	STANDARD
14.	STEP C.2.5: IF the TURB BYP DEMAND (4A12B) alarm is received, THEN ensure output of SGN-PIC-1010, Master Steam Bypass Control, is set to 0% demand.		Examinee marks this Step as "N/A."

SAT / UNSAT
Comments (required for UNSAT):



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	STEP	CUE	STANDARD
15.	STEP C.2.6: Verify SBCS ABNORMAL (6A16A) is clear.		Examinee verifies "SBCS ABNORMAL" alarm is clear.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
16.	STEP C.2.7: IF Condenser pressure is less than 5 inches HgA, THEN verify SBCS COND INTLK (6A16B) is clear.		Examinee verifies that the "SBCS COND INTLK" alarm is clear.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
17.	STEP C.2.8: GO TO ONE of the following: <ul style="list-style-type: none">• Section 6.1, Aligning the Steam Bypass Control System for Normal Operation• Section 6.2, Shifting the Master Steam Bypass Controller Modes	INFORMATION CUE: Another operator will perform Section 6.2.	
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



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APPLICANT

INITIAL CONDITIONS:

- The Steam Bypass Control System has been disconnected at the SBCS Test Panel due to troubleshooting.
- The SBCS is now ready to be returned to service.

INITIATING CUE:

- The CRS directs you to perform Sections C.1 and C.2 of Appendix C of 40OP-9SF05, Operation of Steam Bypass Control System, to Reconnect and Reset the Steam Bypass Control System.

APPLICANT

Operation of the Steam Bypass Control System

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Appendix C - Connecting and Resetting Steam Bypass Control System

C.1 CONNECTING SBCS

___ C.1.1 ANY of the following Prerequisites are met:

- ___ • SFN-C03N, NSSS Control Systems Cabinet, System Mode Selector switch is not in OPERATE.
- ___ • At least one SFN-C03N, NSSS Control Systems Cabinet, NOT IN OPERATE light is ON.

NOTE

___ The following alarms are expected:

- SBCS ABNORMAL (6A16A)
- SBCS COND INTLK (6A16B)
- BOP/NSSS ANALOG INST CAB TRBL (7C15A)

CAUTION

___ Failure to press the EMERGENCY OFF pushbutton at SFN-C03N, NSSS Control Systems Cabinet, may result in a Quick Open signal when the System Mode Selection switch is placed to DISCONNECT.

___ C.1.2 Press the EMERGENCY OFF pushbutton at SFN-C03N, NSSS Control Systems Cabinet.

___ C.1.3 Check ALL of the following:

- ___ • The EMERG OFF light at SFN-C03N, NSSS Control Systems Cabinet, is ON
- ___ • SFN-C03Y, NSSS Control Systems Cabinet, Power Supply light (-15, +15) nest 4 is OFF
- ___ • SFN-C03Y, NSSS Control Systems Cabinet, Power Supply light (-15, +15) nest 5 is OFF
- ___ • SFN-C03Y, NSSS Control Systems Cabinet, Power Supply light (-15, +15) nest 7 is OFF

Operation of the Steam Bypass Control System

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NOTE

___ Performance of Step C.1.4 may cause the following alarm(s):

- SBCS ABNORMAL (6A16A)
- SBCS COND INTLK (6A16B)
- BOP/NSSS ANALOG INST CAB TRBL (7C15A)

___ C.1.4 Place the System Mode Selection switch at SFN-C03N, NSSS Control Systems Cabinet, to DISCONNECT.

___ C.1.5 Press the LIGHT AND TIMER TEST pushbutton on SFN-C03N, NSSS Control Systems Cabinet.

___ C.1.6 Check BOTH of the following lights are OFF:

- ___ • NOT IN OPERATE (1)
- ___ • NOT IN OPERATE (2)

___ C.1.7 **WHEN** 30 seconds has elapsed since pressing the LIGHT AND TIMER TEST pushbutton,
THEN check BOTH of the following lights are ON:

- ___ • NOT IN OPERATE (1)
- ___ • NOT IN OPERATE (2)

___ C.1.8 Place the System Mode Selector switch at SFN-C03N, NSSS Control Systems Cabinet, to OPERATE.

___ C.1.9 **WHEN** 30 seconds has elapsed since placing the System Mode Selector switch to OPERATE,
THEN check BOTH of the following lights are OFF.

- ___ • NOT IN OPERATE (1)
- ___ • NOT IN OPERATE (2)

Operation of the Steam Bypass Control System

40OP-9SF05

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C.2 RESETTNG SBGS

___ C.2.1 ALL of the following Prerequisites are met:

- ___ • SFN-C03N, NSSS Control Systems Cabinet, System Mode Selector switch is in OPERATE
- ___ • The NOT IN OPERATE (1) light at SFN-C03N, NSSS Control Systems Cabinet, is OFF
- ___ • The NOT IN OPERATE (2) light at SFN-C03N, NSSS Control Systems Cabinet, is OFF

___ C.2.2 Ensure SGN-PIC-1010, Master Steam Bypass Control, is in the Manual mode.

___ C.2.3 Ensure SGN-PIC-1010, Master Steam Bypass Control, output is set to 0% demand.

NOTE

___ Performance of Step C.2.4 may cause the following alarm(s):

- SBGS ABNORMAL (6A16A)
- SBGS COND INTLK (6A16B)
- BOP/NSSS ANALOG INST CAB TRBL (7C15A)

___ C.2.4 Take SGN-PIC-1010, Master Steam Bypass Control, to RESET.

Operation of the Steam Bypass Control System

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NOTE

___ The red output indicator of SGN-PIC-1010, Master Control, may jump from 0% demand upon reset. This may result in TURB BYP DEMAND (4A12B) alarm.

- ___ C.2.5 **IF** the TURB BYP DEMAND (4A12B) alarm is received,
THEN ensure output of SGN-PIC-1010, Master Steam Bypass Control, is set to 0% demand.
- ___ C.2.6 Verify SBCS ABNORMAL (6A16A) is clear.
- ___ C.2.7 **IF** Condenser pressure is less than 5 inches HgA,
THEN verify SBCS COND INTLK (6A16B) is clear.
- ___ C.2.8 GO TO ONE of the following:
 - ___ • Section 6.1, Aligning the Steam Bypass Control System for Normal Operation
 - ___ • Section 6.2, Shifting the Master Steam Bypass Controller Modes

End of Appendix C



**ROSIMULATOR JPM S8
PVNGS JOB PERFORMANCE MEASURE
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JPM BASIS INFORMATION

TASK:	1250430201 Respond to a loss of Feed Pump						
TASK STANDARD:	Determine proper Regulating Group 4 overlap; withdraw Reg Group 4; and trip the reactor when continuous CEA movement occurs prior to receiving Pressurizer Hi/Low (High) Level alarm.						
K/A:	3.1-001-K4.02		K/A RATING:	RO:	3.8	SRO:	3.8
K/A:	4.2-001-AA2.05		K/A RATING:	RO:	4.4	SRO:	4.6
APPLICABLE POSITION(S):		RO	VALIDATION TIME:		15 Minutes		
REFERENCES:	40AO-9ZZ09, Reactor Power Cutback (Loss of Feedpump), Revision 26						
SUGGESTED TESTING ENVIRONMENT:		SIMULATOR	X	PLANT		OTHER	

JPM TYPE

Time Critical? (Yes/No) **No** Alternative Path? (Yes/No) **Yes**
PRA/SRA related? (Yes/No) **Yes**

APPROVAL

Developed By: Jordan Johnston Date: 05/04/2007

Revised By: Rusty Quick Date: 03/26/2015

Technical Review _____ Operations Approval _____

EP Review N/A Training Approval _____

(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____*

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



**ROSIMULATOR JPM S8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC EXAM**

1. SIMULATOR SETUP:

- IC#: 620 or 20
- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
IMF mfrD10B k:1	Uncontrolled rod withdrawal in all CEDMCS modes.

- SPECIAL INSTRUCTIONS: (If **NOT** using IC 620)
 - Insert malfunction and place on KEY 1
 - GO TORUN and manually trip "A" Main Feed Pump
 - Acknowledge alarms, wait ~5 minutes for plant response.
 - Using 40AO-9ZZ09, place RPCB out of service, select Manual Sequential on CEDMCS, and lower main turbine load limit pot to illuminated Load Limiting light.
 - Adjust turbine load as necessary to obtain Tave/Tref mismatch of <3°F.
 - Allow the simulator to run ~10 minutes to stabilize plant, THEN GO TOFREEZE
 - Provide Initiating Cue
 - GO TORUN
- REQUIRED CONDITIONS:
 - Stable post RPCB conditions with MFP "A" tripped. Tave/Tref mismatch of <3°F.
 - RPCB out of service, Manual Sequential on CEDMCS, and Load Limiting light on.
- SIMULATOR EVALUATION PRE-CHECK
 - ☐ Correct IC
 - ☐ Alarm Silence Off
 - ☐ Procedures available, page checked, and clean
 - ☐ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40AO-9ZZ09. This JPM was written using Revision 26 of 40AO-9ZZ09. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- MALFUNCTIONS, OVERRIDES, etc. during JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
6	IMF mfrD10B k:1	Near the end of the first 10 inch CEA pull, KEY 1 will begin uncontrolled CEA motion.



**ROSIMULATOR JPM S8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC EXAM**

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- Unit 1 is at 250 EFPD.
- The unit has experienced a Reactor Power Cutback due to a trip of the 'A' Main Feed Pump.
- CEA Groups 4 and 5 are fully inserted into the core.
- The CRS has reviewed Appendix E and authorized CEA withdrawal.

INITIATING CUE:

- The CRS directs you to complete Steps 30 and 31 of 40AO-9ZZ09 to restore normal CEA group overlap.

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) following a JPM Step number denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.



**ROSIMULATOR JPM S8
PVNGS JOB PERFORMANCE MEASURE
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JPM START TIME:

	STEP	CUE	STANDARD
1. *	<p>STEP 30</p> <p>Determine the normal overlap position for RG-4.</p> <p>RG-3 position _____ inches -95</p> <p>RG-4 = _____ inches</p>	<p>EXAMINER CUE: Provide examinee with a yellow copy of pages 17 and 18 of 40AO-9ZZ09.</p>	<p>Based on an initial Reg Group 3 position of 128 inches withdrawn in setup, the examinee determines RG-4 at 33 inches to restore proper overlap.</p> <p>Examiner will have to adjust the standard for RG-3 positions other than 128 inches. Expected conditions should yield a RG-4 position of 30-35 inches.</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			

	STEP	CUE	STANDARD
2.	<p>STEP 31 and 31a</p> <p>IF CEA Reg Group 3 is higher than 95 inches withdrawn, THEN perform the following to restore normal CEA group overlap:</p> <ul style="list-style-type: none"> PERFORM Appendix E, Reactivity Impact While Restoring CEA Overlap. 	<p>If Requested, CUE:</p> <p>The CRS has authorized CEA withdrawal.</p> <p>Provide Examinee with a yellow completed Appendix E.</p>	<p>Examinee determines RG-3 is greater than 95 inches withdrawn.</p> <p>Examinee should recognize that Appendix E was done per Initiating CUE. Examinee may review Appendix E.</p> <p>Examinee should recognize that he has authorization to withdraw RG-4 CEAs per the Initiating Cue.</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



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	STEP	CUE	STANDARD
3.	STEP 31b Monitor CEA alignment using the CEAC CRT when moving CEAs.		Examinee ensures CEAC CRT displays a page showing Group 4 CEA positions. Examinee may also select CEA display for group 4 on CPCs.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
4.	STEP 31c Maintain the Tave/Tref mismatch within +/- 3°F.		Examinee observes Tave/Tref mismatch +/- 3 degrees F throughout steps.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
5.	STEP 31d Wait a minimum of 1 minute between CEA pulls.		Not applicable. JPM will insert malfunction near the end of the first CEA withdrawal.

SAT / UNSAT

Comments (required for UNSAT):



**ROSIMULATOR JPM S8
PVNGS JOB PERFORMANCE MEASURE
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	STEP	CUE	STANDARD
6. *	<p>STEP 31e</p> <p>Withdraw Reg Group 4 in Manual Group “MG” in 10inch increments to 95 inches below the position of Reg Group 3 while closely monitoring the reactor response.</p> <p>Examinee may refer to 40OP-9ZZ05, Appendix L (Routine Operation of CEAs During Power Operation) Section L.2 to select and withdraw RG-4.</p> <ul style="list-style-type: none"> • Ensure the Individual CEA Selection switch is set to a CEA in the group to be moved. • Ensure the Group Select switch is set to the leading CEA group for the individual CEA selected. • Ensure the Mode Select switch is set to MG (Manual Group). • Check the MANUAL GROUP light on at the Mode Indicators above the Mode Select switch. • IF the SM/CRS directs withdrawal of CEAs, THEN place and hold the CEA Joy Stick to WITHDRAW. 	<p>EXAMINER CUE. If requested, provide examinee with a green copy of 40OP-9ZZ05, Appendix L, L.2 (Pages 197 and 198). These steps are reflected in JPM Steps 8-</p> <p>Examiner Note: When the examinee begins pulling Group 4, the driver will insert malfunction RD10B (Key 1) to initiate a continuous CEA withdrawal.</p> <p>Examiner Note: Group 3 will begin withdrawing first, followed by Group 4. Changing the CEDMCS mode selector will have no effect.</p>	<p>Examinee performs the following activities:</p> <ul style="list-style-type: none"> • Selects MANUAL GROUP on CEDMCs control panel. • Selects Group 4 on Group Selector switch. • Places and holds the CEA Joy Stick to WITHDRAW and pulls Group 4.
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



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	STEP	CUE	STANDARD
7.	<p>CEAs continue to move outward.</p> <p>Examinee may refer to the Alarm Response procedure for CEDMCS TRBL due to a “Continuous CEA Motion” input. 40AL-9RK4A, window 4A08A</p> <ul style="list-style-type: none"> • Check for CEA motion. • Check EHC panel for changing load. • Place CEDMCS mode select in Standby. • Verify CEA motion stops. • If CEA motion does not stop, then: <ul style="list-style-type: none"> • Trip the reactor • Go To 40EP-9EO01 	<p>EXAMINER CUE: Provide a green copy of (4A08A) CEDMCS TRBL.</p> <p>If REQUESTED CUE: Acknowledge and concur with examinee’s recommendation to place CEDMCS in STBY.</p> <p>If REQUESTED CUE: Acknowledge and concur with examinee’s recommendation to trip the reactor.</p>	<p>ALTERNATE PATH</p> <p>Examinee recognizes that RG-3 CEAs (and then RG-4 CEAs) continue to withdraw without demand.</p> <p>Examinee recommends going to STANDBY on CEDMCS.</p> <p>Examinee informs CRS that CEAs are continuing to withdraw after placing in standby and recommends tripping the reactor.</p> <p>Critical Portion: Examinee trips the Reactor, by momentarily depressing the 4 MANUAL REACTOR TRIP pushbuttons on B05, prior to receiving the Pressurizer Hi/Low (High) Level alarm on B04.</p>

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
8.	<p>40OP-9ZZ05, Appendix L, L.2.1 and L.2.1.1</p> <p>Initial Conditions</p> <p>Ensure the Individual CEA Selection switch is set to a CEA in the group to be moved.</p>		<p>Examinee selects a rod in Group 4 to monitor.</p>

SAT / UNSAT

Comments (required for UNSAT):



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	STEP	CUE	STANDARD
9.	40OP-9ZZ05, Appendix L, L2.1.2 Ensure the Group Select switch is set to the leading CEA group for the individual CEA selected.		Examinee places the Group Select switch in position 4.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
10.	40OP-9ZZ05, Appendix L, L2.1.3 Ensure the Mode Select switch is set to MG (Manual Group).		Examinee ensures the Mode Select switch is set to MG (Manual Group).

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
11.	40OP-9ZZ05, Appendix L, L2.1.4 Check the MANUAL GROUP light on at the Mode Indicators above the Mode Select switch.		Examinee checks the MANUAL GROUP light on at the Mode Indicators above the Mode Select switch.

SAT / UNSAT

Comments (required for UNSAT):



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	STEP	CUE	STANDARD
12.	<p>40OP-9ZZ05, Appendix L, L.2.2 and L.2.2.1</p> <p>Instructions</p> <p>IF CEA group movement is for ASI control, THEN ensure proper overlap allowed per Section 6.4, ASI Control During Power Operation.</p>		Examinee N/As this step. Movement is for restoring overlap, NOT ASI control.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
13. *	<p>40OP-9ZZ05, Appendix L, L.2.2.2</p> <p>IF the SM/CRS directs withdrawal of CEAs, THEN place and hold the CEA Joy Stick to WITHDRAW.</p>		Examinee places and holds the CEA Joy Stick to WITHDRAW.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
14.	<p>40OP-9ZZ05, Appendix L, L.2.2.2.1</p> <p>Check the sub-group light flashing an upward pointing arrow.</p>		Examinee observes the sub-group light flashing an upward pointing arrow
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
15.	<p>40OP-9ZZ05, Appendix L, L2.2.2.2</p> <p>Check selected CEA group and individual CEA positions are moving as expected using ALL of the following indicators:</p> <ul style="list-style-type: none"> • SFN-JI-16, Selected CEA Group Position • SFN-JI-17, Selected CEA Position • CPC CEAPDS • CPC CEACs 		<p>Examinee checks selected CEA group and individual CEA positions are moving as expected.</p>
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
16.	<p>40OP-9ZZ05, Appendix L, L2.2.2.3</p> <p>IF CEA group movement is NOT for ASI control, THEN ensure BOTH of the following:</p> <ul style="list-style-type: none"> • Proper overlap of 95 inches exists between CEA groups • No out-of-sequence alarms are present 		<p>Examinee monitors for:</p> <ul style="list-style-type: none"> • Proper overlap of 95 inches exists between CEA groups • No out-of-sequence alarms are present
SAT / UNSAT Comments (required for UNSAT):			



**ROSIMULATOR JPM S8
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	STEP	CUE	STANDARD
17.	40OP-9ZZ05, Appendix L, L2.2.3 IF the SM/CRS directs inserting CEAs, THEN place the CEA Joy Stick to INSERT....		Examinee N/As this step. Rods are being withdrawn.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
18.	40OP-9ZZ05, Appendix L, L2.2.4 Monitor ALL of the following during CEA insertion or withdraw: <ul style="list-style-type: none"> Reactor power RCS Tavg CEA group and subgroup deviations ASI 		Examinee monitors: <ul style="list-style-type: none"> Reactor power RCS Tavg CEA group and subgroup deviations ASI
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
19. *	40OP-9ZZ05, Appendix L, L2.2.5 WHEN the identified CEA position is reached, THEN release the CEA Joy Stick.		Examinee notes continuous rod motion. See JPM Step 7.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:



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PVNGS JOB PERFORMANCE MEASURE
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NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT



**ROSIMULATOR JPM S8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC EXAM**

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **Unit 1 is at 250 EFPD.**
- **The unit has experienced a Reactor Power Cutback due to a trip of the 'A' Main Feed Pump.**
- **CEA Groups 4 and 5 are fully inserted into the core.**
- **The CRS has reviewed Appendix E and authorized CEA withdrawal.**

INITIATING CUE:

- **The CRS directs you to complete Steps 30 and 31 of 40AO-9ZZ09 to restore normal CEA group overlap.**

PALO VERDE NUCLEAR GENERATING STATION

40AO-9ZZ09

Revision 26

REACTOR POWER CUTBACK (LOSS OF FEEDPUMP)

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3.0 LOSS OF FEEDPUMP

INSTRUCTIONS

CONTINGENCY ACTIONS

NOTE

The intent of the remainder of this section is to not intentionally raise or lower power until directed to go to 40OP-9ZZ05, Power Operations. It is acceptable if power drifts down while restoring CEA overlap.

___27. Record the following:

Rx Pwr _____% Pt. _____

RCS Temp _____°F Pt. _____

Program Temperature _____°F
(REFER TO Appendix F,
Temperature Control Program)

___28. **IF** a RPCB has **NOT** dropped any
CEA subgroups,
THEN GO TO step 34.

___29. **IF** CEA control is **NOT** available,
THEN dilute the RCS to stabilize
reactor power.

___30. Determine the normal overlap
position for RG-4.

RG-3 position _____ inches

- 95

RG-4 = _____ Inches

**REACTOR POWER CUTBACK
(LOSS OF FEEDPUMP)**

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3.0 LOSS OF FEEDPUMPINSTRUCTIONSCONTINGENCY ACTIONS

- ___ 31. **IF** CEA Reg Group 3 is higher than 95 inches withdrawn,
THEN perform the following to restore normal CEA group overlap:
- a. PERFORM Appendix E, Reactivity Impact While Restoring CEA Overlap.
 - b. Monitor CEA alignment using the CEAC CRT when moving CEAs.
 - c. Maintain the Tave/Tref mismatch within $\pm 3^{\circ}\text{F}$.
 - d. Wait a minimum of 1 minute between CEA pulls.
 - e. Withdraw Reg Group 4 in Manual Group "MG" in 10 inch increments to 95 inches below the position of Reg Group 3 while closely monitoring the reactor response.
 - f. **IF** the rise in reactor power exceeds 1% during any CEA pull,
THEN adjust the amount of the next CEA withdrawal to obtain a less than 1% rise.
 - g. REFER TO Appendix A, CPC / LCO Info.

PALO VERDE NUCLEAR GENERATING STATION

40AO-9ZZ09

Revision 26

**REACTOR POWER CUTBACK
(LOSS OF FEEDPUMP)**

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Appendix E

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Appendix E, Reactivity Impact While Restoring CEA Overlap

INSTRUCTIONS

CONTINGENCY ACTIONS

1. Enter Appendix Entry Time and Date:

(now) (today)

2. Determine how a reactivity insertion will impact **BOTH** of the following:

- Reactor power \longleftrightarrow
- RCS temperature \longleftrightarrow

**REACTOR POWER CUTBACK
(LOSS OF FEEDPUMP)**

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Appendix E

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Appendix E, Reactivity Impact While Restoring CEA OverlapINSTRUCTIONSCONTINGENCY ACTIONS

NOTE

7/10 This appendix is only applicable while withdrawing Reg Group 4 in Manual Group between 0 and 50 inches during the restoration of normal CEA overlap following a RPCB.

NOTE

7/10 The negative reactivity impact of xenon building in has not been included in this evaluation. The effects of xenon will result in a lower temperature and power rise than indicated below.

- 7/10* 3. Determine the maximum expected reactor power and RCS temperature changes for a 10 inch withdrawal of RG-4 using **ANY** of the following information:

BOC (0 EFPD)

- 3°F Tc or 2% power rise

MOC (250 EFPD)

- 2°F Tc or 1.5% power rise

EOC (510 EFPD)

- 1°F Tc or 1% power rise

**REACTOR POWER CUTBACK
(LOSS OF FEEDPUMP)****Appendix E, Reactivity Impact While Restoring CEA Overlap**INSTRUCTIONSCONTINGENCY ACTIONS

NOTE

The goal is to allow a timely restoration of the normal CEA overlap while not challenging a CPC generated VOPT. It is desired to keep the rise in Reactor power at 1% or less for each CEA pull with a 1 minute hold between pulls. However, if any one 10 inch CEA pull results in up to a 2% power rise, a CPC VOPT will still not be challenged. Normal CEA overlap is restored in step 31. in section 3.0 and step 14. in section 4.0.

4. **IF** the rise in reactor power exceeds 1% during any CEA pull, **THEN** adjust the amount of the next CEA withdrawal to obtain a less than 1% rise.

5. **WHEN** CEA overlap has been restored, **THEN** REFER TO the Core Data Book for further reactivity impacts.

End of Appendix

POWER OPERATIONS

40OP-9ZZ05

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L.2 MANUAL GROUP MODE - REGULATING GROUPS

L.2.1 Initial Conditions

- ___ L.2.1.1 Ensure the Individual CEA Selection switch is set to a CEA in the group to be moved.
- ___ L.2.1.2 Ensure the Group Select switch is set to the leading CEA group for the individual CEA selected.
- ___ L.2.1.3 Ensure the Mode Select switch is set to MG (Manual Group).
- ___ L.2.1.4 Check the MANUAL GROUP light on at the Mode Indicators above the Mode Select switch.

L.2.2 Instructions

- ___ L.2.2.1 **IF** CEA group movement is for ASI control,
THEN ensure proper overlap allowed per Section 6.4, ASI Control During Power Operation.
- ___ L.2.2.2 **IF** the SM/CRS directs withdrawal of CEAs,
THEN place and hold the CEA Joy Stick to WITHDRAW.
 - ___ L.2.2.2.1 Check the sub-group light flashing an upward pointing arrow.
 - ___ L.2.2.2.2 Check selected CEA group and individual CEA positions are moving as expected using ALL of the following indicators:
 - ___ • SFN-JI-16, Selected CEA Group Position
 - ___ • SFN-JI-17, Selected CEA Position
 - ___ • CPC CEAPDS
 - ___ • CPC CEACs
 - ___ L.2.2.2.3 **IF** CEA group movement is NOT for ASI control,
THEN ensure BOTH of the following:
 - ___ • Proper overlap of 95 inches exists between CEA groups
 - ___ • No out-of-sequence alarms are present

POWER OPERATIONS

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___ L.2.2.3 **IF** the SM/CRS directs inserting CEAs,
THEN place the CEA Joy Stick to INSERT.

___ L.2.2.3.1 Check the sub-group light flashing the downward pointing arrow.

___ L.2.2.3.2 Check selected CEA group and individual CEA positions are moving as expected using ALL of the following indicators:

- ___ • SFN-JI-16, Selected CEA Group Position
- ___ • SFN-JI-17, Selected CEA Position
- ___ • CPC CEAPDS
- ___ • CPC CEACs

___ L.2.2.3.3 Check the following for CEA group overlap:

- ___ a. **IF** CEA group movement is NOT for ASI control,
THEN ensure BOTH of the following:
 - ___ • Proper overlap of 95 inches between CEA groups
 - ___ • No out-of-sequence alarms present
- ___ b. **IF** CEA group movement is for ASI control,
THEN ensure proper overlap allowed per Section 6.4, ASI Control During Power Operation.

___ L.2.2.4 Monitor ALL of the following during CEA insertion or withdraw:

- ___ • Reactor power
- ___ • RCS Tavg
- ___ • CEA group and subgroup deviations
- ___ • ASI

___ L.2.2.5 **WHEN** the identified CEA position is reached,
THEN release the CEA Joy Stick.

___ L.2.2.6 **IF** additional CEA movement in Manual Group is required,
THEN repeat Step L.2.2.2 thru Step L.2.2.5.

L.2.3 Restoration

___ L.2.3.1 Place the CEA Mode Select switch in the position directed by the SM/CRS.



**RO SIMULATOR JPM S8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC EXAM**

JPM BASIS INFORMATION

TASK:	1250430201 Respond to a loss of Feed Pump						
TASK STANDARD:	Determine proper Regulating Group 4 overlap; withdraw Reg Group 4; and trip the reactor when continuous CEA movement occurs prior to receiving Pressurizer Hi/Low (High) Level alarm.						
K/A:	3.1-001-K4.02		K/A RATING:	RO:	3.8	SRO:	3.8
K/A:	4.2-001-AA2.05		K/A RATING:	RO:	4.4	SRO:	4.6
APPLICABLE POSITION(S):	RO		VALIDATION TIME:	15 Minutes			
REFERENCES:	40AO-9ZZ09, Reactor Power Cutback (Loss of Feedpump), Revision 26						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? (Yes/No) **No** Alternative Path? (Yes/No) **Yes**
PRA/SRA related? (Yes/No) **Yes**

APPROVAL

Developed By: Jordan Johnston Date: 05/04/2007

Revised By: Larry Burton Date: 04/03/2015

Technical Review _____ Operations Approval _____

EP Review N/A Training Approval _____

(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



**RO SIMULATOR JPM S8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC EXAM**

1. SIMULATOR SETUP:

- IC#: 620 or 20
- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
IMF mfrD10B k:1	Uncontrolled rod withdrawal in all CEDMCS modes.

- SPECIAL INSTRUCTIONS: (If **NOT** using IC 620)
 - Insert malfunction and place on KEY 1
 - GO TORUN and manually trip “A” Main Feed Pump
 - Acknowledge alarms, wait ~5 minutes for plant response.
 - Using 40AO-9ZZ09, place RPCB out of service, select Manual Sequential on CEDMCS, and lower main turbine load limit pot to illuminated Load Limiting light.
 - Adjust turbine load as necessary to obtain Tave/Tref mismatch of <3°F.
 - Allow the simulator to run ~10 minutes to stabilize plant, THEN GO TOFREEZE
 - Provide Initiating Cue
 - GO TORUN
- REQUIRED CONDITIONS:
 - Stable post RPCB conditions with MFP “A” tripped. Tave/Tref mismatch of <3°F.
 - RPCB out of service, Manual Sequential on CEDMCS, and Load Limiting light on.
- SIMULATOR EVALUATION PRE-CHECK
 - ☐ Correct IC
 - ☐ Alarm Silence Off
 - ☐ Procedures available, page checked, and clean
 - ☐ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40AO-9ZZ09. This JPM was written using Revision 26 of 40AO-9ZZ09. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- MALFUNCTIONS, OVERRIDES, etc. during JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
6	IMF mfrD10B k:1	Near the end of the first 10 inch CEA pull, KEY 1 will begin uncontrolled CEA motion.



**RO SIMULATOR JPM S8
PVNGS JOB PERFORMANCE MEASURE
2015 NRC EXAM**

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- Unit 1 is at 250 EFPD.
- The unit has experienced a Reactor Power Cutback due to a trip of the 'A' Main Feed Pump.
- CEA Groups 4 and 5 are fully inserted into the core.
- The CRS has reviewed Appendix E and authorized CEA withdrawal.

INITIATING CUE:

- The CRS directs you to complete Steps 30 and 31 of 40AO-9ZZ09 to restore normal CEA group overlap.

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) following a JPM Step number denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.



**RO SIMULATOR JPM S8
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JPM START TIME:

	STEP	CUE	STANDARD
1. *	<p>STEP 30</p> <p>Determine the normal overlap position for RG-4.</p> <p>RG-3 position _____ inches -95</p> <p>RG-4 = _____ inches</p>	<p>EXAMINER CUE: Provide examinee with a yellow copy of pages 17 and 18 of 40AO-9ZZ09.</p>	<p>Based on an initial Reg Group 3 position of 128 inches withdrawn in setup, the examinee determines RG-4 at 33 inches to restore proper overlap.</p> <p>Examiner will have to adjust the standard for RG-3 positions other than 128 inches. Expected conditions should yield a RG-4 position of 30-35 inches.</p>

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
2.	<p>STEP 31 and 31a</p> <p>IF CEA Reg Group 3 is higher than 95 inches withdrawn, THEN perform the following to restore normal CEA group overlap:</p> <ul style="list-style-type: none"> PERFORM Appendix E, Reactivity Impact While Restoring CEA Overlap. 	<p>If Requested, CUE:</p> <p>The CRS has authorized CEA withdrawal.</p> <p>Provide Examinee with a yellow completed Appendix E.</p>	<p>Examinee determines RG-3 is greater than 95 inches withdrawn.</p> <p>Examinee should recognize that Appendix E was done per Initiating CUE. Examinee may review Appendix E.</p> <p>Examinee should recognize that he has authorization to withdraw RG-4 CEAs per the Initiating Cue.</p>

SAT / UNSAT

Comments (required for UNSAT):



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	STEP	CUE	STANDARD
3.	STEP 31b Monitor CEA alignment using the CEAC CRT when moving CEAs.		Examinee ensures CEAC CRT displays a page showing Group 4 CEA positions. Examinee may also select CEA display for group 4 on CPCs.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
4.	STEP 31c Maintain the Tave/Tref mismatch within +/- 3°F.		Examinee observes Tave/Tref mismatch +/- 3 degrees F throughout steps.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
5.	STEP 31d Wait a minimum of 1 minute between CEA pulls.		Not applicable. JPM will insert malfunction near the end of the first CEA withdrawal.

SAT / UNSAT

Comments (required for UNSAT):



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	STEP	CUE	STANDARD
6. *	<p>STEP 31e</p> <p>Withdraw Reg Group 4 in Manual Group “MG” in 10inch increments to 95 inches below the position of Reg Group 3 while closely monitoring the reactor response.</p> <p>Examinee may refer to 40OP-9ZZ05, Appendix L (Routine Operation of CEAs During Power Operation) Section L.2 to select and withdraw RG-4.</p> <ul style="list-style-type: none"> • Ensure the Individual CEA Selection switch is set to a CEA in the group to be moved. • Ensure the Group Select switch is set to the leading CEA group for the individual CEA selected. • Ensure the Mode Select switch is set to MG (Manual Group). • Check the MANUAL GROUP light on at the Mode Indicators above the Mode Select switch. • IF the SM/CRS directs withdrawal of CEAs, THEN place and hold the CEA Joy Stick to WITHDRAW. 	<p>EXAMINER CUE. If requested, provide examinee with a green copy of 40OP-9ZZ05, Appendix L, L.2 (Pages 197 and 198).</p> <p>Examiner Note: When the examinee begins pulling Group 4, the driver will insert malfunction RD10B (Key 1) to initiate a continuous CEA withdrawal.</p> <p>Examiner Note: Group 3 will begin withdrawing first, followed by Group 4. Changing the CEDMCS mode selector will have no effect.</p>	<p>Examinee performs the following activities:</p> <ul style="list-style-type: none"> • Selects MANUAL GROUP on CEDMCs control panel. • Selects Group 4 on Group Selector switch. • Places and holds the CEA Joy Stick to WITHDRAW and pulls Group 4.
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



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	STEP	CUE	STANDARD
7. *	<p>CEAs continue to move outward.</p> <p>Examinee may refer to the Alarm Response procedure for CEDMCS TRBL due to a “Continuous CEA Motion” input. 40AL-9RK4A, window 4A08A</p> <ul style="list-style-type: none">• Check for CEA motion.• Check EHC panel for changing load.• Place CEDMCS mode select in Standby.• Verify CEA motion stops.• If CEA motion does not stop, then:<ul style="list-style-type: none">• Trip the reactor• Go To 40EP-9EO01	<p>EXAMINER CUE: Provide a green copy of (4A08A) CEDMCS TRBL.</p> <p>If REQUESTED CUE: Acknowledge and concur with examinee’s recommendation to place CEDMCS in STBY.</p> <p>If REQUESTED CUE: Acknowledge and concur with examinee’s recommendation to trip the reactor.</p>	<p>ALTERNATE PATH</p> <p>Examinee recognizes that RG-3 CEAs (and then RG-4 CEAs) continue to withdraw without demand.</p> <p>Examinee recommends going to STANDBY on CEDMCS.</p> <p>Examinee informs CRS that CEAs are continuing to withdraw after placing in standby and recommends tripping the reactor.</p> <p>Critical Portion: Examinee trips the Reactor, by momentarily depressing the 4 MANUAL REACTOR TRIP pushbuttons on B05, prior to receiving the Pressurizer Hi/Low (High) Level alarm on B04.</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			

JPM STOP TIME:

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT



**RO SIMULATOR JPM S8
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EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **Unit 1 is at 250 EFPD.**
- **The unit has experienced a Reactor Power Cutback due to a trip of the 'A' Main Feed Pump.**
- **CEA Groups 4 and 5 are fully inserted into the core.**
- **The CRS has reviewed Appendix E and authorized CEA withdrawal.**

INITIATING CUE:

- **The CRS directs you to complete Steps 30 and 31 of 40AO-9ZZ09 to restore normal CEA group overlap.**

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40AO-9ZZ09

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REACTOR POWER CUTBACK (LOSS OF FEEDPUMP)

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3.0 LOSS OF FEEDPUMP

INSTRUCTIONS

CONTINGENCY ACTIONS

NOTE

The intent of the remainder of this section is to not intentionally raise or lower power until directed to go to 40OP-9ZZ05, Power Operations. It is acceptable if power drifts down while restoring CEA overlap.

___27. Record the following:

Rx Pwr _____% Pt. _____

RCS Temp _____°F Pt. _____

Program Temperature _____°F
(REFER TO Appendix F,
Temperature Control Program)

___28. **IF** a RPCB has **NOT** dropped any
CEA subgroups,
THEN GO TO step 34.

___29. **IF** CEA control is **NOT** available,
THEN dilute the RCS to stabilize
reactor power.

___30. Determine the normal overlap
position for RG-4.

RG-3 position _____ inches

- 95

RG-4 = _____ Inches

**REACTOR POWER CUTBACK
(LOSS OF FEEDPUMP)**

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3.0 LOSS OF FEEDPUMPINSTRUCTIONSCONTINGENCY ACTIONS

- ___ 31. **IF** CEA Reg Group 3 is higher than 95 inches withdrawn,
THEN perform the following to restore normal CEA group overlap:
- a. PERFORM Appendix E, Reactivity Impact While Restoring CEA Overlap.
 - b. Monitor CEA alignment using the CEAC CRT when moving CEAs.
 - c. Maintain the Tave/Tref mismatch within $\pm 3^{\circ}\text{F}$.
 - d. Wait a minimum of 1 minute between CEA pulls.
 - e. Withdraw Reg Group 4 in Manual Group "MG" in 10 inch increments to 95 inches below the position of Reg Group 3 while closely monitoring the reactor response.
 - f. **IF** the rise in reactor power exceeds 1% during any CEA pull,
THEN adjust the amount of the next CEA withdrawal to obtain a less than 1% rise.
 - g. REFER TO Appendix A, CPC / LCO Info.

PALO VERDE NUCLEAR GENERATING STATION

40AO-9ZZ09

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**REACTOR POWER CUTBACK
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Appendix E

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Appendix E, Reactivity Impact While Restoring CEA Overlap

INSTRUCTIONS

CONTINGENCY ACTIONS

1. Enter Appendix Entry Time and Date:

(now) (today)

2. Determine how a reactivity insertion will impact **BOTH** of the following:

- Reactor power \longleftrightarrow
- RCS temperature \longleftrightarrow

**REACTOR POWER CUTBACK
(LOSS OF FEEDPUMP)****Appendix E, Reactivity Impact While Restoring CEA Overlap**INSTRUCTIONSCONTINGENCY ACTIONS

NOTE

7/10 This appendix is only applicable while withdrawing Reg Group 4 in Manual Group between 0 and 50 inches during the restoration of normal CEA overlap following a RPCB.

NOTE

7/10 The negative reactivity impact of xenon building in has not been included in this evaluation. The effects of xenon will result in a lower temperature and power rise than indicated below.

- 7/10* 3. Determine the maximum expected reactor power and RCS temperature changes for a 10 inch withdrawal of RG-4 using **ANY** of the following information:

BOC (0 EFPD)

- 3°F Tc or 2% power rise

MOC (250 EFPD)

- 2°F Tc or 1.5% power rise

EOC (510 EFPD)

- 1°F Tc or 1% power rise

**REACTOR POWER CUTBACK
(LOSS OF FEEDPUMP)**

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Appendix E

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Appendix E, Reactivity Impact While Restoring CEA OverlapINSTRUCTIONSCONTINGENCY ACTIONS

NOTE

The goal is to allow a timely restoration of the normal CEA overlap while not challenging a CPC generated VOPT. It is desired to keep the rise in Reactor power at 1% or less for each CEA pull with a 1 minute hold between pulls. However, if any one 10 inch CEA pull results in up to a 2% power rise, a CPC VOPT will still not be challenged. Normal CEA overlap is restored in step 31. in section 3.0 and step 14. in section 4.0.

4. **IF** the rise in reactor power exceeds 1% during any CEA pull, **THEN** adjust the amount of the next CEA withdrawal to obtain a less than 1% rise.

5. **WHEN** CEA overlap has been restored, **THEN** REFER TO the Core Data Book for further reactivity impacts.

End of Appendix



**SROI/SROU SIMULATOR JPMS9
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JPM BASIS INFORMATION

TASK:	1240050201 Implement SGTR instructions and contingencies						
TASK STANDARD:	SG #2 is isolated per Standard Appendix 114.						
K/A:	3.4 035 A2.01		K/A RATING:	RO:	4.5	SRO:	4.6
10 CFR 55:	45(a)(3), 45(a)(5)						
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	10 minutes			
REFERENCES:	40EP-9EO04, Steam Generator Tube Rupture, Rev 28, 40EP-9EO10 Standard Appendices, Standard Appendix 114, Rev 88						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? (Yes/No) **No** Alternative Path? (Yes/No) **Yes**
PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: John Dedon Date: 05/15/2007

Revised By: Alan Malley Date: 08/3/2014

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



**SROI/SROU SIMULATOR JPMS9
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1. SIMULATOR SETUP:

- IC#: 604
- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
cmAVFW04SGAUV175_4 (in setup for IC 604)	Mechanical seizure of SG-175
cmAVFW04SGBUV135_4 (in setup for IC 604)	Mechanical seizure of SG-135

- SPECIAL INSTRUCTIONS:
 1. **IF** IC604 is used, reset to **IC 604**, GO TORUN, acknowledge alarms, **THEN** Go To Step 2
 2. Provide **INITIATING CUE**
 3. GO TORUN
 4. To run this as a stand-alone JPM or in the event that the scenario file/IC is unavailable:
 - a. Reset to IC#: 20
 - b. GOTO RUN
 - c. Insert a SG #2 Tube Rupture (TH06B f.10)
 - d. Trip the Reactor and perform SPTAs
 - e. After SIAS initiates run scenario file MCCON
 - f. Cooldown the RCS to < 540°F using the SBCS.
 - g. Depressurize the RCS (maintain within PT limits)
 - h. Reset the MSIS setpoints
 - i. Run scenario file 2015 NRC S-9.scn from an exam jump drive.
 - j. GOTO FREEZE
 - k. Give examinee **INITIATING CUE**
 - l. When examinee is ready, GOTORUN
- REQUIRED CONDITIONS:
 1. SGTR in Steam Generator #2 and RCS cooled down to < 540 degrees.
- SIMULATOR EVALUATION PRE-CHECK
 - ☐ Correct IC
 - ☐ Alarm Silence Off
 - ☐ Procedures available, page checked, and clean
 - ☐ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40EP-9EO10, Standard Appendices, Standard Appendix 114 Rev 88 available (although pages are marked pages Rev 82).

3. JPM PERFORMANCE:

- REMOTE FUNCTIONS, MALFUNCTIONS, OVERRIDES, etc. during JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
None		



**SROI/SROU SIMULATOR JPMS9
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INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY,DO NOT OPERATE**any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DONOT**enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



**SROI/SROU SIMULATOR JPMS9
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- A Steam Generator Tube Rupture has occurred in SG #2.
- The Unit has been tripped.
- The plant has been cooled down to <540°F T-hot.

INITIATING CUE:

- The CRS directs you to isolate SG #2 using 40EP-9EO10, Standard Appendices, Standard Appendix 114.



**SROI/SROU SIMULATOR JPMS9
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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



**SROI/SROU SIMULATOR JPMS9
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JPM START TIME:

	STEP	CUE	STANDARD
1.	Step 1: Close BOTH ADVs on Steam Generator 2: <ul style="list-style-type: none"> • SGB-HV-185 • SGA-HV-179 		Examine ensures both ADVs on SG #2 are closed as seen on B06 using the lights below controllers SGA-HIC-179A and SGB-HV-185A.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
2. *	Step 2: Close BOTH MSIVs on Steam Generator 2: <ul style="list-style-type: none"> • SGE-UV-171 • SGE-UV-181 		Examinee closes both MSIVs on SG #2 using either handswitch SGA-HS-250 OR SGB-HS-252. Examiner Note: Either handswitch closes both MSIVs.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
3.	Step 3: Ensure SGE-UV-183, SG 2 MSIVBypass Valve, is closed.		Examinee ensures SGE-UV-183 is closed using the indicating lights above SGB-HS-183A.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
4. *	Step 4: Close BOTH SG 2 Economizer FWIVs: <ul style="list-style-type: none"> • SGA-UV-177 • SGB-UV-137 		Examinee closes the Economizer Valves on SG #2 using handswitches SGA-HS-177C AND SGB-HS-137C. Examiner Note: Unlike the MSIVs, the examinee must use both handswitches to close both Economizer Valves.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
5.	Step 5: Close BOTH SG 2 Downcomer Isolation Valves: <ul style="list-style-type: none"> • SGA-UV-175 • SGB-UV-135 		Examinee attempts to close the Downcomer Isolation Valves using SGA-HS-175 and SGB-HS-135. Both valves will fail to close
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
6. *	Step 5.1: Close BOTH SG 2 Downcomer Isolation Block Valves: <ul style="list-style-type: none"> • SGN-HV-1144, SG 2 FW Isolation Block Valve • SGN-HV-1145, SG 2 FW Isolation Bypass Valve 	ALTERNATE PATH	Examinee closes SGN-HV-1144 using handswitches SGN-HS-1144. SGN-HV-1145 is already closed.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
7.	Step 6: Close BOTH SG 2 Blowdown Containment Isolation Valves: <ul style="list-style-type: none"> • SGA-UV-500S • SGB-UV-500R 		Examinee verifies closed SG #2 Blowdown Containment Isolation Valves on B07 using SGA-HS-500S and SGB-HS-500R.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
8. *	Step 7: Close BOTH of the following steam trap isolation valves: <ul style="list-style-type: none"> • SGA-UV-1134, Steam TrapM24 Isolation • SGB-UV-1136A/1136B, Steam Trap M03/M04 Isolations 		Examinee attempts to close the steam trap isolation valves on B06 using SGA-HS-1134 and SGB-HS-1136. However, SGB-HS-1136 will have dual indication requiring the operator to perform the contingency action.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
9. *	Step 7.1: Locally isolate all of the following steam traps: <ul style="list-style-type: none"> • SGE-V092, “STEAM TRAP SGNM24 ISOLATION” • SGE-V139, “STEAM TRAP SGNM03 ISOLATION” • SGE-V145, “STEAM TRAP SGNM04 ISOLATION” 	INFORM CUE: As the area operator acknowledge the direction to manually isolate the steam traps. <div style="text-align: center;">ALTERNATE PATH</div>	Examinee directs an operator to locally isolate the following steam traps: <ul style="list-style-type: none"> • SGE-V092, “STEAM TRAP SGNM24 ISOLATION” • SGE-V139, “STEAM TRAP SGNM03 ISOLATION” • SGE-V145, “STEAM TRAP SGNM04 ISOLATION” EXAMINER NOTE: Since M24 is already isolated, it is ONLY critical to isolate M03 and M04.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
10.	Step 8: Check that the Steam Generator Safety Valves are closed.		Examinee checks SG#2 Safety Valves closed using the Sonic Safety Valve Position indication lights above the ADV controllers on B06.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
11.	Step 9: Ensure BOTH Aux Feed Pump A Steam Supply Valves are closed: <ul style="list-style-type: none"> • SGA-UV-138, SG 2 Steam Supply to Aux Feed Pump A • SGA-UV-138A, SG 2 Steam Supply to Aux Feed Pump A Bypass 		Examinee ensures both the steam supply valves for AF 'A' are closed on B06 using SGA-HS-138A and the lights above SGA-HS-138 for SGA-UV-138A.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
12.	Step 10: Ensure BOTH Auxiliary Feedwater Isolation Valves are closed: <ul style="list-style-type: none">• AFA-UV-37, Aux Feedwater to SG2 Downstream Valve• AFB-UV-35, Aux Feedwater to SG2 Downstream Valve		Examinee checks both Aux Feed Isolations to SG #2 are closed on B06 using handswitches SGA-HS-37A and SGB-HS-35.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



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APPLICANT

INITIAL CONDITIONS:

- A Steam Generator Tube Rupture has occurred in SG #2.
- The Unit has been tripped.
- The plant has been cooled down to <540°F-hot.

INITIATING CUE:

- The CRS directs you to isolate SG #2 using 40EP-9EO10, Standard Appendices, Standard Appendix 114.

APPLICANT

Appendix 114

Steam Generator 2 Isolation

INSTRUCTIONS

CONTINGENCY ACTIONS

___ 1. Close **BOTH** ADVs on Steam Generator 2:

- SGB-HV-185
- SGA-HV-179

1.1 PERFORM Appendix 18, Local ADV Operation

___ 2. Close **BOTH** MSIVs on Steam Generator 2:

- SGE-UV-171
- SGE-UV-181

___ 3. Ensure SGE-UV-183, SG 2 MSIV Bypass Valve, is closed.

3.1 Close SGE-V084, "MSIV BYPASS MANUAL ISOLATION VALVE"

___ 4. Close **BOTH** SG 2 Economizer FWIVs:

- SGA-UV-177
- SGB-UV-137

___ 5. Close **BOTH** SG 2 Downcomer Isolation Valves:

- SGA-UV-175
- SGB-UV-135

5.1 Close **BOTH** SG 2 Downcomer Isolation Block Valves:

- SGN-HV-1144, SG 2 FW Isolation Block Valve
- SGN-HV-1145, SG 2 FW Isolation Bypass Valve

STANDARD APPENDICES

INSTRUCTIONS

- ___ 6. Close **BOTH** SG 2 Blowdown Containment Isolation Valves:

- SGA-UV-500S
- SGB-UV-500R

CONTINGENCY ACTIONS

- 6.1 Close **ALL** of the manual blowdown isolation valves on SG 2.

- SCN-V103, "SCN-HV-019C OUTLET ISOLATION VALVE" (S/G #2 HIGH RATE B/D TO CONDENSER)
- SCN-V020, "SCN-HV-019A OUTLET ISOLATION VALVE" (S/G #2 NORMAL RATE B/D TO CONDENSER)
- SCN-V073, "SCN-HV-019B OUTLET ISOLATION VALVE" (S/G #2 ABNORMAL RATE B/D TO CONDENSER)
- SCN-V005, "SCN-HV-002A OUTLET ISOLATION VALVE" (S/G #2 NORMAL RATE B/D TO THE BFT)
- SCN-V055, "SCN-HV-002B OUTLET ISOLATION VALVE" (S/G #2 ABNORMAL RATE B/D TO THE BFT)
- SCN-V115, "SCN-HV-002C OUTLET ISOLATION VALVE" (S/G #2 HIGH RATE B/D TO THE BFT)

STANDARD APPENDICES

INSTRUCTIONS

- ___ 7. Close **BOTH** of the following steam trap isolation valves:
- SGA-UV-1134, Steam Trap M24 Isolation
 - SGB-UV-1136A/1136B, Steam Trap M03/M04 Isolations
- ___ 8. Check that the Steam Generator Safety Valves are closed.
- ___ 9. Ensure **BOTH** Aux Feed Pump A Steam Supply Valves are closed:
- SGA-UV-138, SG 2 Steam Supply to Aux Feed Pump A
 - SGA-UV-138A, SG 2 Steam Supply to Aux Feed Pump A Bypass
- ___ 10. Ensure **BOTH** Auxiliary Feedwater Isolation Valves are closed:
- AFA-UV-37, Aux Feedwater to SG2 Downstream Valve
 - AFB-UV-35, Aux Feedwater to SG2 Downstream Valve

CONTINGENCY ACTIONS

- 7.1 Locally isolate **ALL** of the following steam traps:
- SGE-V092, "STEAM TRAP SGN-M24 ISOLATION"
 - SGE-V139, "STEAM TRAP SGN-M03 ISOLATION"
 - SGE-V145, "STEAM TRAP SGN-M04 ISOLATION"

End of Appendix



**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
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JPM BASIS INFORMATION

TASK:	125044201 Respond to a Control Room Fire						
TASK STANDARD:	PBB-S04 has been reenergized with DG 'B' and the SP pump started using Appendix E of 40AO-9ZZ19						
K/A:	4.2068AA1.10		K/A RATING:	RO:	3.7	SRO:	3.9
10 CFR 55:	459(a)(5), 45(a)(6)						
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	20 MINUTES			
REFERENCES:	40AO-9ZZ19, Control Room Fire, Rev 31						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR			PLANT	X	OTHER	

JPM TYPE

Time Critical? (Yes/No) **Yes**

Alternative Path? (Yes/No) **Yes**

PRA/SRA related? (Yes/No) **Yes**

APPROVAL

Developed By: Alan Malley Date: 08/31/2004

Revised By: Rusty Quick Date: 03/26/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

1. SIMULATOR SETUP:

N/A

2. SPECIAL TOOLS/EQUIPMENT:

- Copy of 40AO-9ZZ19, Control Room Fire, Appendix E, Rev 31

3. JPM PERFORMANCE:

N/A



**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DONOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- The control room has been evacuated due to a fire.
- There has been a loss of offsite power. No automatic start and loading of the Emergency Diesel Generators, or load shed has occurred.
- The SM has waived the EPE requirements for this task per step 3.20.1 of 01DP-0IS13, PVNGS - ELECTRICAL SAFE WORK PRACTICES.
- Assume you have a portable lantern.

INITIATING CUE:

- The CRS directs you to complete Appendix E of 40AO-9ZZ19 to manually start and load the "B" Diesel Generator to reenergize PBB-S04 and start the Spray Pond Pump, SPB-P01.
- This is a TIME Critical JPM.



**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
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INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.

This page redacted because it contained operations telephone numbers.



**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
3. *	Step 3: On PHB-M32, place ALL of the following Control Room Circuits Disconnect Switches in "LOCAL": (Switchgear Room B) <ul style="list-style-type: none"> • PHB-M3209, Battery Charger D PKD-H14 • PHB-M3205, Control Room Circuits Disconnect Switches (4 switches) 	INFORM CUE: As examinee simulates operating each switch report "the switch is in LOCAL."	Examinee simulates placing the switches on PHB-M32 from LOCAL/REMOTE to LOCAL.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
4. *	Step 4: Place all of the disconnect switches on DGB-C01, DG Disconnect Cabinet in "LOCAL". (5 switches) (Switchgear Room B)	INFORM CUE: As examinee simulates operating each switch report "the switch is in LOCAL."	Examinee simulates placing all 5 switches on cabinet DGB-C01 to 'LOCAL'
SAT / UNSAT Comments (required for UNSAT):			



**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
5. *	<p>Step 5:</p> <p>Ensure the disconnect switches for ALL of the following breakers on PBB-S04 are in “LOCAL”:</p> <ul style="list-style-type: none"> • PBB-S04S, Aux Feed Water Pump AFB-P01 • PBB-S04N, 4160 - 480 LC PGB-L36 • PBB-S04M, Essential Cooling Water Pump EWB-P01 • PBB-S04L, ESF Service Transformer NBN-X03 • PBB-S04K, ESF Service Transformer NBN-X04 • PBB-S04J, 4160 - 480 LC PGB-L32 • PBB-S04H, 4160 - 480 LC PGB-L34 • PBB-S04G, Essential Chiller ECB-E01 • PBB-S04F, LP Safety Injection Pump SIB-P01 • PBB-S04C, Essential Spray Pond Pump SPB-P01 • PBB-S04B, Diesel Generator PEB-G02 	<p>INFORM CUE:</p> <p>As examinee simulates operating each switch report “the switch is in LOCAL.”</p>	<p>Examinee simulates taking the LOCAL/REMOTE switches on each of the following breakers to ‘LOCAL’:</p> <ul style="list-style-type: none"> • PBB-S04S, Aux Feed Water Pump AFB-P01 • PBB-S04N, 4160 - 480 LC PGB-L36 • PBB-S04M, Essential Cooling Water Pump EWB-P01 • PBB-S04L, ESF Service Transformer NBN-X03 • PBB-S04K, ESF Service Transformer NBN-X04 • PBB-S04J, 4160 - 480 LC PGB-L32 • PBB-S04H, 4160 - 480 LC PGB-L34 • PBB-S04G, Essential Chiller ECB-E01 • PBB-S04F, LP Safety Injection Pump SIB-P01 • PBB-S04C, Essential Spray Pond Pump SPB-P01 • PBB-S04B, Diesel Generator PEB-G02
<p>SAT / UNSAT</p> <p>Comments (required for UNSAT):</p>			



**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
6. *	<p>Step 6:</p> <p>Ensure that ALL of the following breakers on PBB-S04 are open:</p> <ul style="list-style-type: none"> • PBB-S04B, Diesel Generator PEB-G02 • PBB-S04C, Essential Spray Pond Pump SPB-P01 • PBB-S04F, LP Safety Injection Pump SIB-P01 • PBB-S04G, Essential Chiller ECB-E01 • PBB-S04K, ESF Service Transformer NBN-X04 • PBB-S04L, ESF Service Transformer NBN-X03 • PBB-S04M, Essential Cooling Water Pump EWB-P01 • PBB-S04S, Aux Feed Water Pump AFB-P01 	<p>INFORM CUE:</p> <p>As examinee checks the following breakers, cue applicant: “The green light is ON and the red light is OFF:”</p> <ul style="list-style-type: none"> • PBB-S04B, Diesel Generator PEB-G02 • PBB-S04C, Essential Spray Pond Pump SPB-P01 • PBB-S04F, LP Safety Injection Pump SIB-P01 • PBB-S04G, Essential Chiller ECB-E01 • PBB-S04M, Essential Cooling Water Pump EWB-P01 • PBB-S04S, Aux Feed Water Pump AFB-P01 • PBB-S04L, ESF Service Transformer NBN-X03 <p>For the following breakers, cue the applicant; “The red light is ON and the green light is OFF:”</p> <ul style="list-style-type: none"> • PBB-S04K, ESF Service Transformer NBN-X04 	<p>Examinee simulates checking or opening the following breakers on PBB-S04 by using the indicating lights on the front of each breaker:</p> <ul style="list-style-type: none"> • PBB-S04B, Diesel Generator PEB-G02 • PBB-S04C, Essential Spray Pond Pump SPB-P01 • PBB-S04F, LP Safety Injection Pump SIB-P01 • PBB-S04G, Essential Chiller ECB-E01 • PBB-S04K, ESF Service Transformer NBN-X04 • PBB-S04L, ESF Service Transformer NBN-X03 • PBB-S04M, Essential Cooling Water Pump EWB-P01 • PBB-S04S, Aux Feed Water Pump AFB-P01 • PBB-S04L, ESF Service Transformer NBN-X03 <p>Examiner Note: Only critical aspect is opening the following breakers:</p> <ul style="list-style-type: none"> • PBB-S04K, ESF Service Transformer NBN-X04 <p>The other breakers are already open.</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			

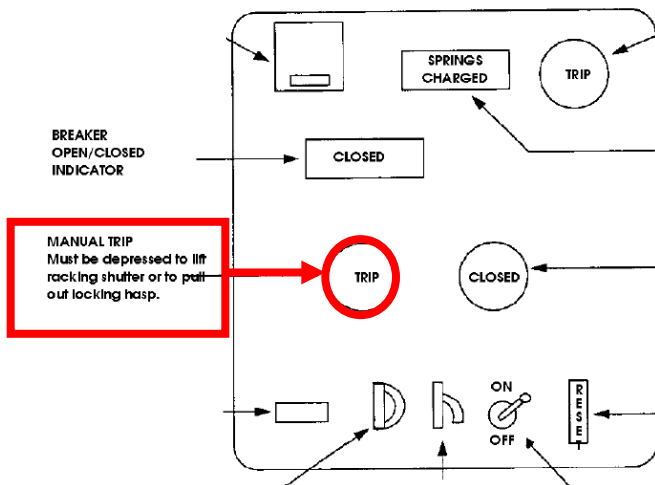


**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
7. *	Step 7: Perform the following at PGB-L32: a. Place disconnect switch CS-1/B2 on PGB-L32B1 in "LOCAL". b. Place disconnect switch CS-2/C4 on PGB-L32C1 in "LOCAL". c. Open PGB-L32C4, Charging Pump 2 CHB-P01.	INFORM CUE; As examinee simulates operating the LOCAL/REMOTE switches report "the switch is in LOCAL." If asked, provide an initial cue that the red light is ON and the green light is OFF. As examinee simulates opening breaker PGB-L32C4 report green light is on, red light is off and breaker position indicator shows OPEN.	Examinee simulates placing the LOCAL/REMOTE switches CS-1/B2 and CS-2/C4 on the following breakers respectively to LOCAL: • PGB-L32B1. • PGB-L32C1 Examinee simulates opening Charging Pump 2 breaker PGB-L32C4 by pushing the switch highlighted below. Examiner Note: The TRIP button on the upper right of the breaker is for tripping the breaker when it is in the TEST Position only. IF the examinee uses this TRIP button report the red light is on, the green light is off and the breaker position indicator indicates CLOSED.

SAT / UNSAT

Comments (required for UNSAT):





**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
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	STEP	CUE	STANDARD
8. *	Step 8: Place disconnect switch CS-1/B2 on PGB-L34B1 in "LOCAL".	INFORMATION CUE: As examinee simulates operating switch report "the switch is in LOCAL."	Examinee simulates placing disconnect switch CS-1/B2 to LOCAL.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
9. *	Step 9: Place disconnect switch CS-2/B2 on PGB-L36B1 in "LOCAL".	INFORMATION CUE: As examinee simulates operating switch report "the switch is in LOCAL."	Examinee simulates placing disconnect switch CS-2/B2 to LOCAL.
SAT / UNSAT Comments (required for UNSAT):			



**RO/SROI/SROU IN-PLANT JPM P1
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	STEP	CUE	STANDARD
10. *	Step 10: IF Diesel Generator B is NOT running, THEN start Diesel Generator B using DGB-HS-031, Emergency Start - Simulated LOP. (DG B Control Panel)	IF REQUESTED CUE: Use pen to indicate DG speed is zero on the DG Control Panel or report there is no noise from the DG running. INFORM CUE: DG B is starting.	Examinee determines DG is not running from the initiating cue. Examinee simulates starting DG B using DGB-HS-031.
			Examiner Note: Time critical portion starts here.
			START TIME _____
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
11.	Step 11: Check that BOTH of the following conditions for closing the DG Output Breaker are met: <ul style="list-style-type: none"> • Diesel Generator B voltage is 3740 - 4580 VAC. • Diesel Generator B engine speed is approximately 600 rpm. 	INFORMATION CUE: Using pen indicate voltage is ~4160 VAC and speed is 600 rpm.	Examinee checks voltage and speed of the DG using the meters on the DG control panel.
SAT / UNSAT Comments (required for UNSAT):			



**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
12.	Step 12: Close breaker PBB-S04B, Diesel Generator PEB-G02, using the local control switch.	INFORM CUE (after examinee simulates attempting to close PBB-S04B): The green light is ON and the red light is OFF	Examinee simulates an attempt to close PBB-S04B using the local control switch.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
13.	Step 12.1: IF PBB-S04B did NOT close, THEN GO TO Step 13 of this appendix to manually close the breaker.		Examinee goes to Step 13. Examiner Note: The examinee should determine it is not a control power issue due to having the lights on the front of the breaker.

SAT / UNSAT

Comments (required for UNSAT):



**RO/SROI/SROU IN-PLANT JPM P1
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	STEP	CUE	STANDARD
14.	Step 13: IF breaker PBB-S04B, Diesel Generator PEB-G02, will be closed manually, THEN perform the following: a. Check the closing spring indicates “CHGD”. b. Press the “MANUALCLOSE” plunger for the breaker.	INFORM CUE” Show the examinee Picture 1 and explain that this is how the breaker would look if he opened the door.	Examinee checks the closing spring indicator and it indicates not charged.
SAT / UNSAT Comments (required for UNSAT):			



**RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
15. *	Step 13.1: IF PBB-S04B will be closed manually, AND the closing spring indicator does NOT indicate “CHGD”, THEN perform the following to manually close the breaker: <div><div>a. Obtain ALL of the following equipment from FPN-C02, Emergency Equipment Cabinet:<ul style="list-style-type: none">• Ratchet• Extension• 5/8 inch socket</div><div>b. Open the 125Vdc control power breaker.</div><div>c. Place the ratchet on the charging spring’s motor eccentric, hex charging stud. (Right hand side between the charging springs)</div><div>d. Ratchet the hexed charging stud clockwise to obtain a “CHGD” indication.</div><div>e. Press the “MANUAL CLOSE” plunger for the breaker.</div></div>	INFORM CUE: Give the examinee Picture 2 and have the examinee show where the DC control power breaker is located. Then give the examinee Picture 3 and have him explain how the control power breaker is opened. Have the examinee show you where he would look for the charging stud on Picture 1, then give the examinee Picture 4. After the examinee explains how to charge the springs and simulates pushing the MANUAL CLOSE plunger, inform the examinee the breaker indicator shows a red, CLOSED flag.	Examinee simulates retrieving the Ratchet, Extension and 5/8 inch socket from the emergency cabinet in the ‘A’ Train SWGR room. Examinee explains how to charge the springs and simulates pushing the MANUAL CLOSE plunger for the breaker.
		ALTERNATE PATH	
SAT / UNSAT Comments (required for UNSAT):			



RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
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	STEP	CUE	STANDARD
16. *	Step 14: Close breaker PBB-S04C, Essential Spray Pond Pump SPB-P01.	INFORM CUE (after examinee simulates closing breaker PBB-S04C): The red light is ON and the green light is OFF. Another Operator will complete the remainder of this procedure	Examinee simulates closing breaker PBB-S04C using the local handswitch. Examiner Note: Time Critical Portion of this JPM ends here. Examiner Note: 40OP-9DG02, Emergency Diesel Generator B, Limitation 3.2.3, states: Safe operating time periods following a loss of Spray Pond water: <ul style="list-style-type: none">• Full load - 2.6 minutes• Zero load - 15 minutes FINISH TIME _____ * Time recorded in step 10 until finish time must be less than 15 minutes.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



RO/SROI/SROU IN-PLANT JPM P1
PVNGS JOB PERFORMANCE MEASURE
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APPLICANT

INITIAL CONDITIONS:

- The control room has been evacuated due to a fire.
- There has been a loss of offsite power. No automatic start and loading of the Emergency Diesel Generators, or load shed has occurred.
- The SM has waived the EPE requirements for this task per step 3.20.1 of 01DP-0IS13, PVNGS - ELECTRICAL SAFE WORK PRACTICES.
- Assume you have a portable lantern.

INITIATING CUE:

- The CRS directs you to complete Appendix E of 40AO-9ZZ19 to manually start and load the "B" Diesel Generator to reenergize PBB-S04 and start the Spray Pond Pump, SPB-P01.
- **THIS IS A TIME CRITICAL JPM.**

APPLICANT

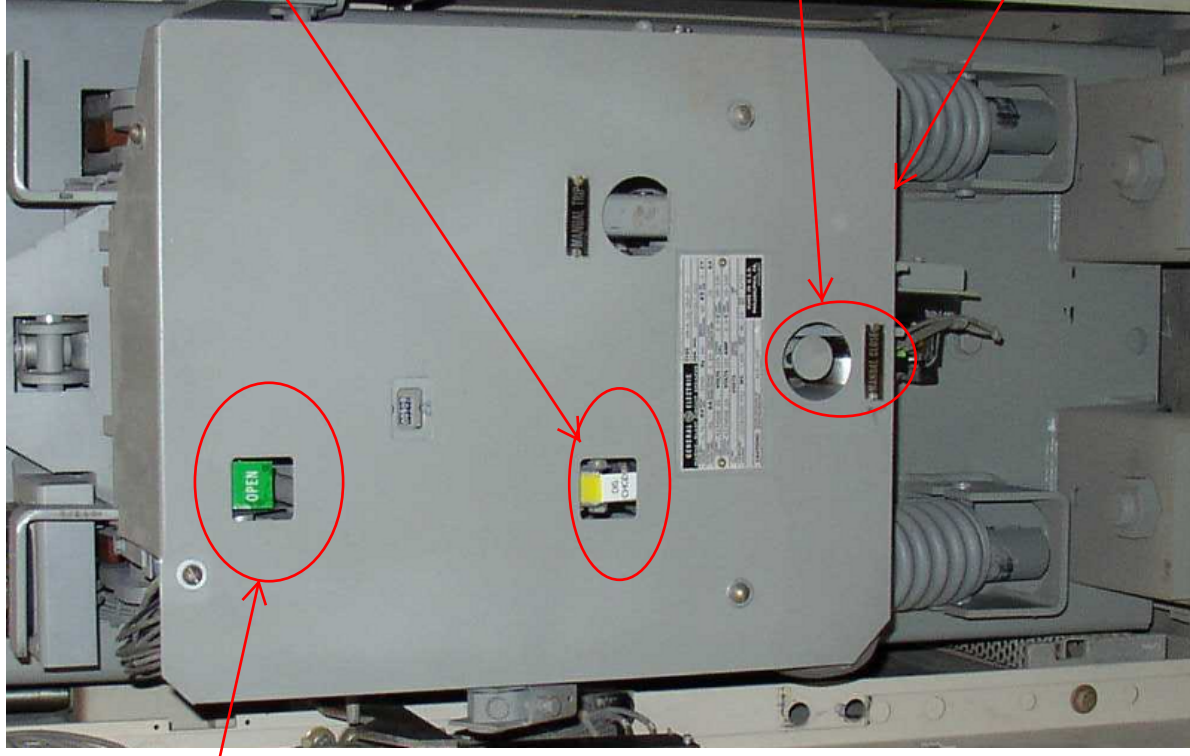
JPM Step 15:
When MANUAL
CLOSE plunger is
depressed, this
changes to a red,
CLOSED flag.

JPM Step 14:
Spring indicates "DISCGHD"
JPM Step 15:
When ratchet properly engaged and
operated, this changes to "CHGD"

PICTURE 1

JPM Step 15:
MANUAL CLOSE
plunger

JPM Step 15:
Charging stud is
located under
here.



JPM Step 15:
DC control power
breaker opens to the
"UP" position.

PICTURE 3

3

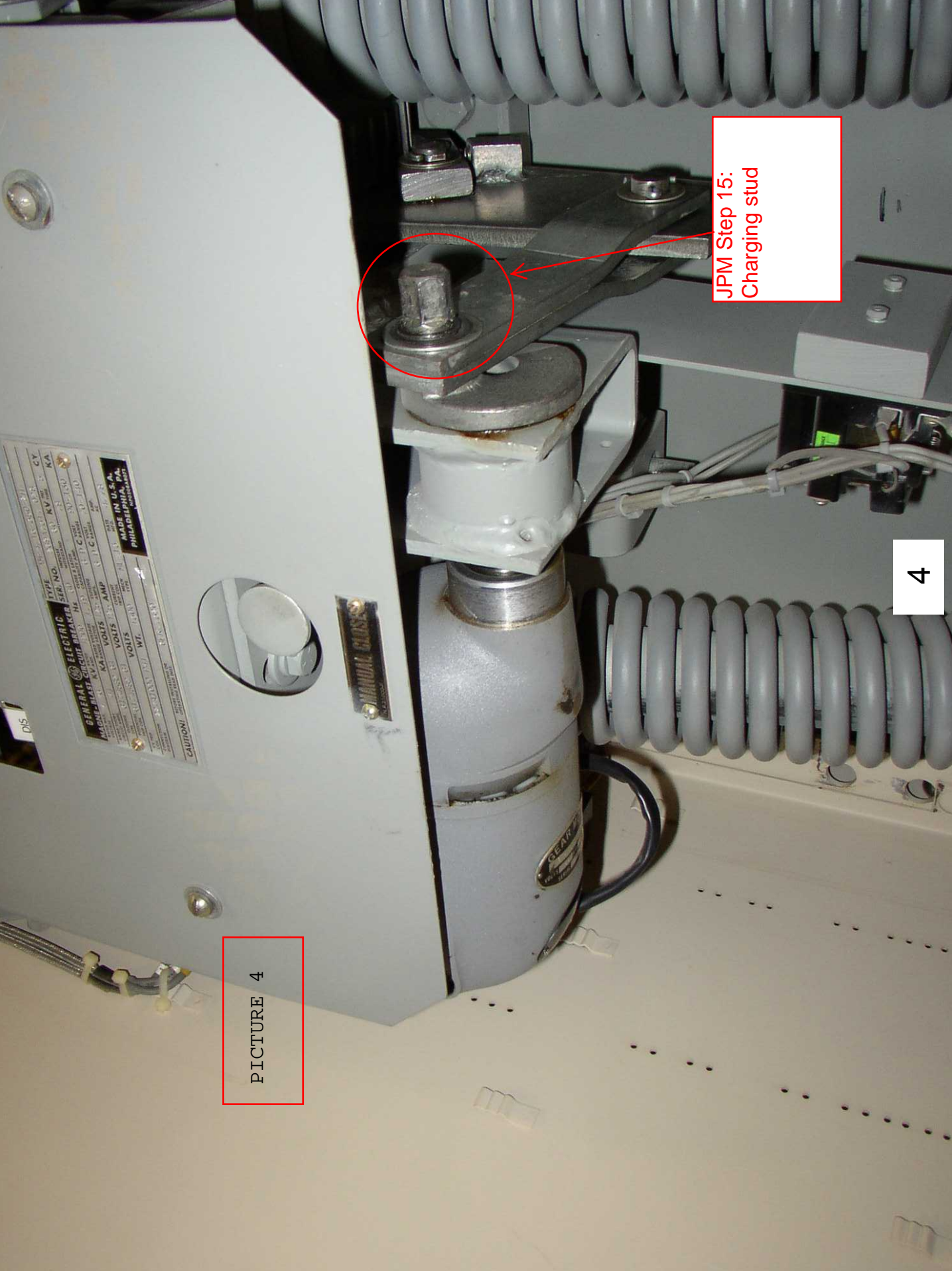




CAUTION
HARDWARE
ARE
CAUTION
EAR PROTECTORS
REQUIRED IN
THIS POSITION

PICTURE 2

JPM Step 15
DC Control
Power Breaker



JPM Step 15:
Charging stud

4

PICTURE 4

PICTURE 1

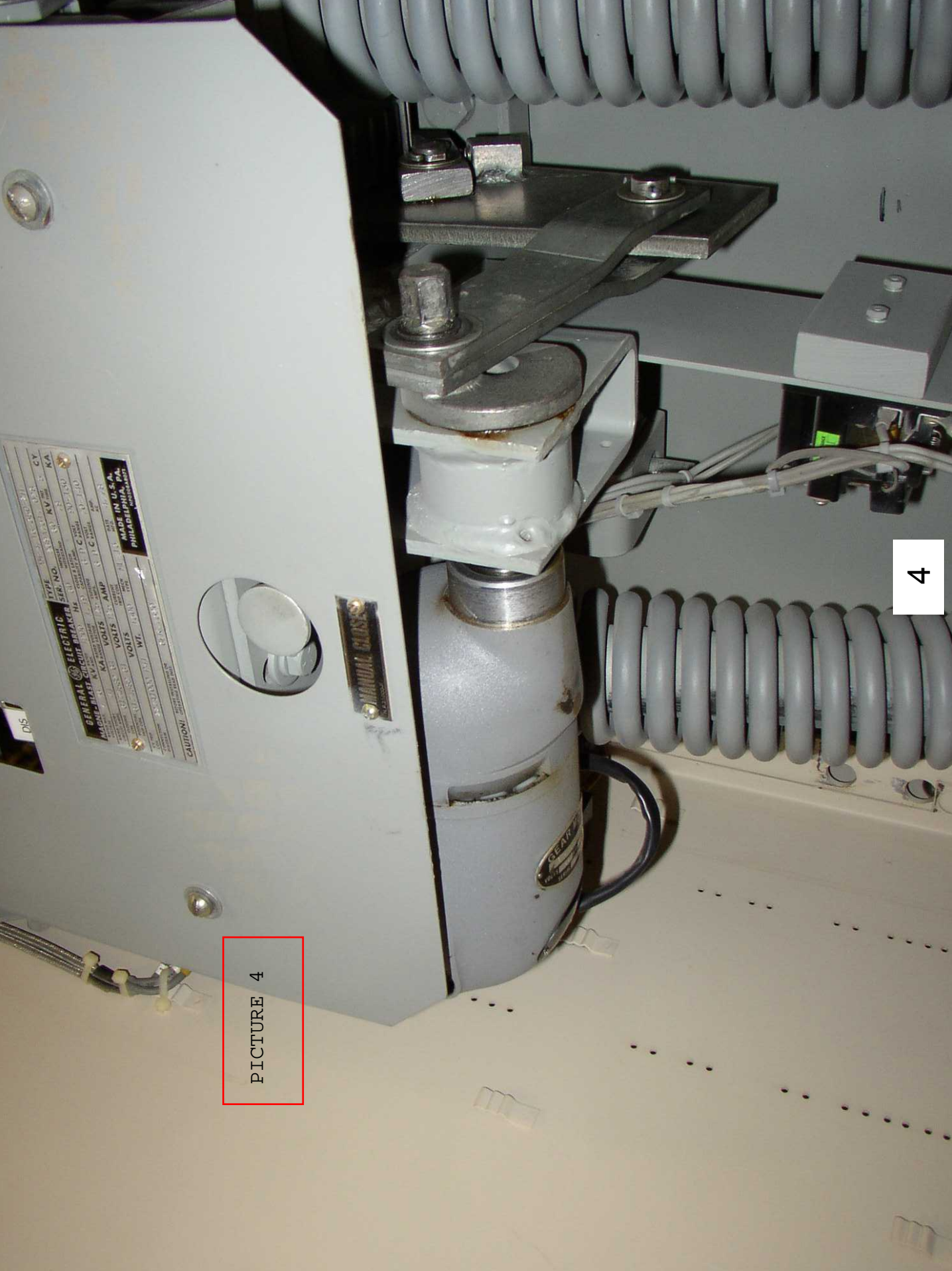




PICTURE 3



PICTURE 2



PICTURE 4

4

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energized

INSTRUCTIONSCONTINGENCY ACTIONS

- ____ 1. Enter Appendix Entry Time
and Date:

----- **NOTE** -----

The telephone number for the B Train Remote Shutdown Panel is:

Unit 1 - 82-1235

Unit 2 - 82-2235

Unit 3 - 82-3235

----- **NOTE** -----

Actions directed by this appendix are time critical and must be performed as quickly as possible to ensure that effects of the fire do not prevent safe shutdown of the unit.

----- **NOTE** -----

Portable lanterns should be used when performing actions in response to a fire. This will ensure that lighting is available if the emergency lighting system is degraded.

- ____ 2. Obtain a portable lantern from
FPN-C02, Emergency Equipment
Cabinet.
(Switchgear Room B, Northwest
corner)

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energized

INSTRUCTIONSCONTINGENCY ACTIONS

- ___ 3. On PHB-M32, place **ALL** of the following Control Room Circuits Disconnect Switches in "LOCAL": (Switchgear Room B)
- PHB-M3209, Battery Charger D PKD-H14
 - PHB-M3205, Control Room Circuits Disconnect Switches (4 switches)
- ___ 4. Place all of the disconnect switches on DGB-C01, DG Disconnect Cabinet in "LOCAL". (5 switches) (Switchgear Room B)

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energized

INSTRUCTIONSCONTINGENCY ACTIONS

- ___ 5. Ensure the disconnect switches for **ALL** of the following breakers on PBB-S04 are in "LOCAL":

- PBB-S04S, Aux Feed Water Pump AFB-P01
- PBB-S04N, 4160 - 480 LC PGB-L36
- PBB-S04M, Essential Cooling Water Pump EWB-P01
- PBB-S04L, ESF Service Transformer NBN-X03
- PBB-S04K, ESF Service Transformer NBN-X04
- PBB-S04J, 4160 - 480 LC PGB-L32
- PBB-S04H, 4160 - 480 LC PGB-L34
- PBB-S04G, Essential Chiller ECB-E01
- PBB-S04F, LP Safety Injection Pump SIB-P01
- PBB-S04C, Essential Spray Pond Pump SPB-P01
- PBB-S04B, Diesel Generator PEB-G02

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energized

INSTRUCTIONSCONTINGENCY ACTIONS

___ 6. Ensure that **ALL** of the following breakers on PBB-S04 are open:

- PBB-S04B, Diesel Generator PEB-G02
- PBB-S04C, Essential Spray Pond Pump SPB-P01
- PBB-S04F, LP Safety Injection Pump SIB-P01
- PBB-S04G, Essential Chiller ECB-E01
- PBB-S04K, ESF Service Transformer NBN-X04
- PBB-S04L, ESF Service Transformer NBN-X03
- PBB-S04M, Essential Cooling Water Pump EWB-P01
- PBB-S04S, Aux Feed Water Pump AFB-P01

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energized

INSTRUCTIONSCONTINGENCY ACTIONS

___ 7. Perform the following at PGB-L32:

- a. Place disconnect switch
CS-1/B2 on PGB-L32B1 in
"LOCAL".
- b. Place disconnect switch
CS-2/C4 on PGB-L32C1 in
"LOCAL".
- c. Open PGB-L32C4, Charging
Pump 2 CHB-P01.

___ 8. Place disconnect switch
CS-1/B2 on PGB-L34B1 in
"LOCAL".

___ 9. Place disconnect switch
CS-2/B2 on PGB-L36B1 in
"LOCAL".

CONTROL ROOM FIRE

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Appendix E

Page 6 of 16

Appendix E, PBB-S04 De-energized

INSTRUCTIONS

- ___ 10. **IF** Diesel Generator B is **NOT** running,
THEN start Diesel Generator B using DGB-HS-031, Emergency Start - Simulated LOP.
(DG B Control Panel)

- ___ 11. Check that **BOTH** of the following conditions for closing the DG Output Breaker are met:
- Diesel Generator B voltage is 3740 - 4580 VAC.
 - Diesel Generator B engine speed is approximately 600 rpm.

CONTINGENCY ACTIONS

- ___ 10.1 **IF** Diesel Generator B did **NOT** start,
THEN perform the following to restore power to the local control panels:
- a. Cycle **ALL** of the following breakers open and close:
 - 72DC1
(Inside Panel DGB-B01)
 - 72DC2
(Inside Panel DGB-B01)
 - 72CP1
(Inside Panel DGB-B02, Lower right corner)
 - b. Press DGB-HS-031, Emergency Start - Simulated LOP.
(DG B Control Panel)
- ___ 11.1 **IF ANY** of the conditions for closing the DG Output Breaker are **NOT** met,
THEN perform the following:
- a. Inform the CRS.
 - b. **WHEN** all conditions for closing the DG Output Breaker are met,
THEN continue in this appendix.

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energized

INSTRUCTIONS

___ 12. Close breaker PBB-S04B, Diesel Generator PEB-G02, using the local control switch.

___ 13. **IF** breaker PBB-S04B, Diesel Generator PEB-G02, will be closed manually, **THEN perform** the following:

- a. Check the closing spring indicates "CHGD".
- b. Press the "MANUAL CLOSE" plunger for the breaker.

CONTINGENCY ACTIONS

___ 12.1 **IF** PBB-S04B did **NOT** close, **THEN GO TO** Step 13. of this appendix to manually close the breaker.

___ 13.1 **IF** PBB-S04B will be closed manually, **AND** the closing spring indicator does **NOT** indicate "CHGD", **THEN perform** the following to manually close the breaker:

- a. Obtain ALL of the following equipment from FPN-C02, Emergency Equipment Cabinet:
 - Ratchet
 - Extension
 - 5/8 inch socket
- b. Open the 125Vdc control power breaker.
- c. Place the ratchet on the charging springs motor eccentric, hex charging stud. (Right hand side between the charging springs)
- d. Ratchet the hexed charging stud clockwise to obtain a "CHGD" indication.
- e. Press the "MANUAL CLOSE" plunger for the breaker.

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energized

INSTRUCTIONSCONTINGENCY ACTIONS

- ___ 14. Close breaker PBB-S04C,
Essential Spray Pond Pump
SPB-P01.

NOTE

The Essential Chiller will start approximately one minute after the handswitch is placed in the closed position.

- ___ 15. Ensure that **ALL** of the following breakers are closed in the order listed allowing at least ten seconds between starts:
- PBB-S04H, 4160 - 480 LC
PGB-L34
 - PBB-S04J, 4160 - 480 LC
PGB-L32
 - PBB-S04M, Essential
Cooling Water Pump
EWB-P01
 - PBB-S04N, 4160 - 480 LC
PGB-L36
 - PBB-S04S, Aux Feed Water
Pump AFB-P01
 - PBB-S04G, Essential Chiller
ECB-E01

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energized

INSTRUCTIONSCONTINGENCY ACTIONS

- ___ 16. Contact the CRS and confirm that Charging Pump suction has been shifted to the RWT.
(Performed in Appendix G, Upper Auxiliary Building Actions)
[Ref. Step 4.13]
- ___ 17. Close PGB-L32C4, Charging Pump 2 CHB-P01.
- ___ 18. Inform the CRS that PBB-S04 is energized by DG B and **ALL** of the following are running:
- Charging Pump B
 - Aux Feed Pump B
 - Spray Pond Pump B
 - Essential Cooling Water Pump B
 - Essential Chiller B
- ___ 19. **IF** Battery Charger D was initially aligned to PKD-M44,
THEN perform the following:
- a. Ensure that PHB-M3209, Battery Charger D PKD-H14, is "ON".
 - b. Close the main contactor for Battery Charger PKD-H14 on PHB-M3209.

CONTROL ROOM FIRE

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Appendix E, PBB-S04 De-energized

INSTRUCTIONS

___ 20. On PHB-M32, ensure that **BOTH** of the following fans are operating:

- HJB-J01A, Cont Bldg
Battery Room D Ess Exh
Fan (PHB-M3206)
- HJB-J01B, Cont Bldg
Battery Room B Ess Exh
Fan (PHB-M3207)

CONTINGENCY ACTIONS

___ 20.1 **IF** HJB-J01A did **NOT** start, **THEN** perform the following to restore electrical power:

- a. Open PHB-M3206.
- b. Direct electrical personnel to replace the two 2 amp control power fuses for PHB-M3206.
- c. Close PHB-M3206.
- d. Start HJB-J01A using the local control switch at PHB-M3206.

___ 20.2 **IF** HJB-J01B did **NOT** start, **THEN** perform the following to restore electrical power:

- a. Open PHB-M3207.
- b. Direct electrical personnel to replace the two 2 amp control power fuses for PHB-M3207.
- c. Close PHB-M3207.
- d. Start HJB-J01B using the local control switch at PHB-M3207.

CONTROL ROOM FIRE

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Appendix E, PBB-S04 De-energized

INSTRUCTIONS

___ 21. Check that PND-D28 is energized by its inverter by **ALL** of the following:

- Inverter PND-N14 is energized
- **Unit 1 only** - Transfer Switch is in "INVERTER"
- **Unit 2 & 3 only** - The Forward Transfer Light is lit

CONTINGENCY ACTIONS

___ 21.1 Perform the following to ensure that PND-D28 is energized by the Voltage Regulator:

- a. Ensure that breaker PHB-M3210, To Voltage Regulator for 120VAC Vital Dist Panel PND-V28, is "ON".
- b. Close the main contactor for Voltage Regulator PND-V28 on PHB-M3210.
- c. **Unit 1 only** - On Inverter PND-N14, ensure the Transfer Switch is selected to "BYPASS".
- d. **Unit 2 & 3 only** - On Inverter PND-N14, ensure the Reverse Transfer Light is lit.

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energized

INSTRUCTIONSCONTINGENCY ACTIONS

- ___ 22. **IF** Battery Charger B was initially aligned to PKB-M42,
THEN direct the Lower Aux Building Operator to perform the following:
- a. Ensure that PHB-M3627, Battery Charger PKB-H12 Supply Breaker, is "ON".
 - b. Close the main contactor for Battery Charger B PKB-H12 on PHB-M3627.
 - c. Inform the CRS that Battery Charger B is energized.
- ___ 23. **IF** Battery Charger BD was initially aligned to either PKB-M42 or PKD-M44,
THEN direct the Lower Aux Building Operator to perform the following:
- a. Ensure that PHB-M3425, Battery Charger PKB-H16 Supply Breaker, is "ON".
 - b. Close the main contactor for Battery Charger PKB-H16 on PHB-M3425.
 - c. Inform the CRS that Battery Charger BD is energized.

CONTROL ROOM FIRE

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Appendix E, PBB-S04 De-energized

INSTRUCTIONS

___ 24. Check that PNB-D26 is energized by its inverter by **ALL** of the following:

- Inverter PNB-N12 is energized
- **Unit 1 only** - Transfer Switch is in "INVERTER"
- **Unit 2 & 3 only** - The Forward Transfer Light is lit

CONTINGENCY ACTIONS

___ 24.1 Perform the following to ensure that PNB-D26 is energized by the Voltage Regulator:

- a. Direct the Lower Aux Building Operator to ensure that breaker PHB-M3626, Voltage Regulator PNB-V26 Supply Breaker, is "ON".
- b. Direct the Lower Aux Building Operator to close the main contactor for Voltage Regulator PNB-V26 on PHB-M3626.
- c. **Unit 1 only** - On Inverter PNB-N12, ensure the Transfer Switch is selected to "BYPASS".
- d. **Unit 2 & 3 only** - On Inverter PNB-N12, ensure the Reverse Transfer Light is lit.

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energized

INSTRUCTIONS

- ___ 25. Start HDB-J01, Essential Exhaust Fan, using HDB-HS-14. (DG Control Panel)

- ___ 26. Ensure that DGB-V064, Jacket Water Standpipe Make-up Header Isolation Valve, is closed. (DG B Room)

CONTINGENCY ACTIONS

- ___ 25.1 **IF** HDB-J01 did **NOT** start, **THEN** perform the following to manually close the breaker:
- a. Check that the lockout relay for PGB-L32D2 is **NOT** tripped.
 - b. Manually close Breaker PGB-L32D2 by pulling up the manual close lever.
- ___ 25.2 **IF** HDB-J01 did **NOT** start, **THEN** perform the following to restore electrical power:
- a. Obtain two 30 amp fuses from FPN-C02, Emergency Equipment Cabinet.
 - b. Replace EE control fuses. (Back side of Load Center PGB-L32 Section D2)
 - c. Check that the 86 lockout relay for PGB-L32D2 is **NOT** tripped.
 - d. Start HDB-J01 at the breaker or using HDB-HS-14. (DG Control Panel)

CONTROL ROOM FIRE

Appendix E, PBB-S04 De-energizedINSTRUCTIONSCONTINGENCY ACTIONS

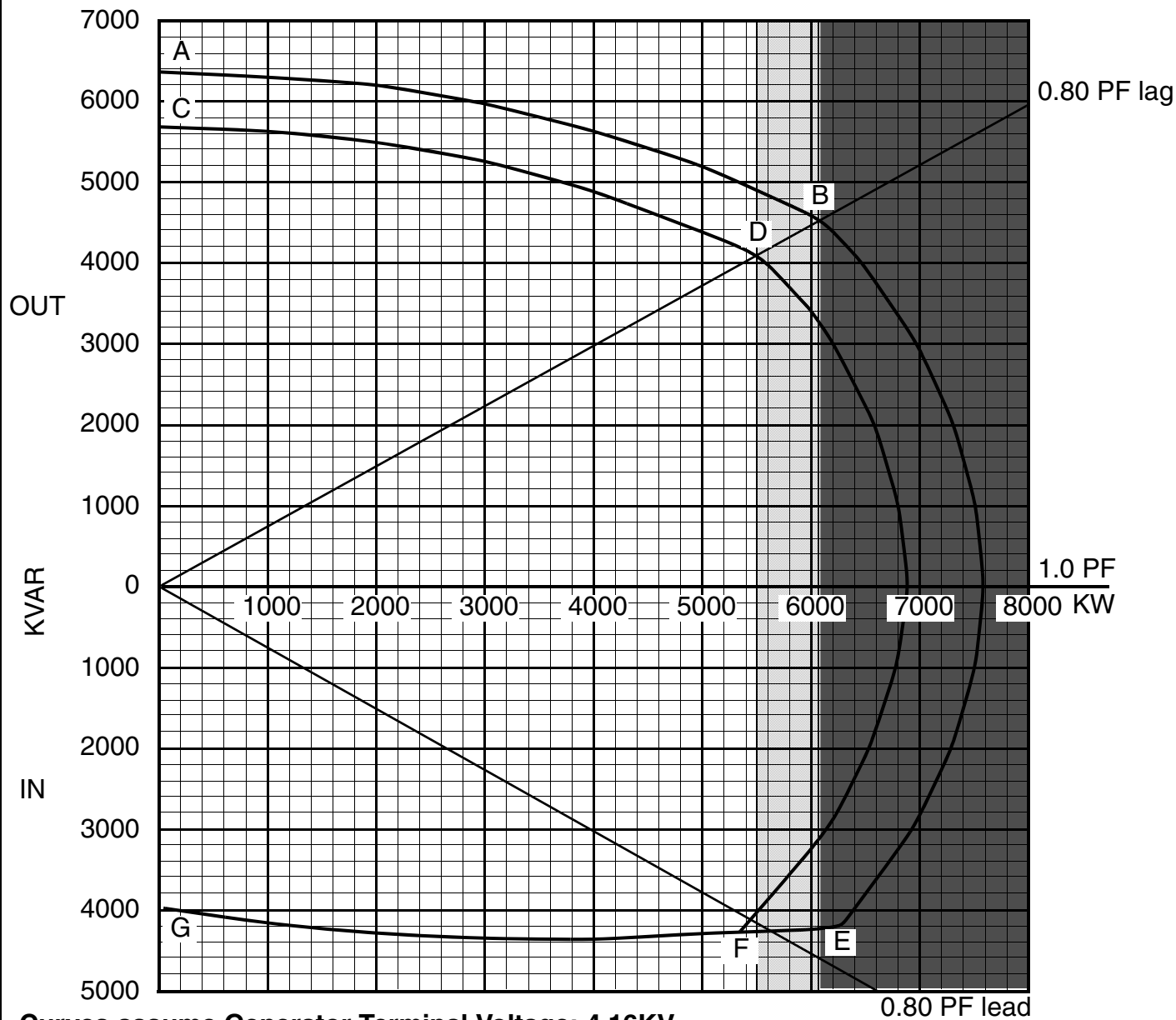
- ___ 27. Check that Diesel Generator B is operating within its capability curve.
REFER TO Attachment E-1, Diesel Generator Capability Curve.

End of Appendix

CONTROL ROOM FIRE

Attachment E-1, Diesel Generator Capability Curve

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**Curves assume Generator Terminal Voltage: 4.16KV****CURVE**

AB: 2 Hour Overload Field Limit
 CD: Rated Field Limit
 BE: 2 Hour Overload
 DF: Continuous Duty
 EG: Steady State Stability Limit At Rated Voltage

SHADE

5500 to 6050 KW - The diesel may be operated for no more than 2 hours per 24 hours in this region.



> 6050 KW - The diesel may not be operated in this region except as directed and monitored by engineering.

End of Attachment



**RO/SROI/SROU IN-PLANT JPM P2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

JPM BASIS INFORMATION

TASK:	1240001401 Perform LM-charging pump hot leg injection Train A HPSI						
TASK STANDARD:	Charging Pump A aligned for Hot Leg Injection Train A HPSI						
K/A:	3.1004 A2.14		K/A RATING:	RO:	3.8	SRO:	3.9
10 CFR 55:	45(a)(5), 45(a)(6)						
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	10 minutes			
REFERENCES:	40EP-9EO10, Standard Appendices, Rev 88, Attachment 208-A, Rev 82						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR			PLANT	X	OTHER	

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **No**

PRA/SRA related? (Yes/No) **No**

APPROVAL

Developed By: Alan Malley Date: 08/13/2014

Revised By: Rusty Quick Date: 03/30/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



**RO/SROI/SROU IN-PLANT JPM P2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

1. SIMULATOR SETUP:

N/A

2. SPECIAL TOOLS/EQUIPMENT:

- Copy of 40EP-9EO10, Standard Appendices, Attachment 208-A, Rev 88 (although page is marked Rev 82)

3. JPM PERFORMANCE:

N/A



**RO/SROI/SROU IN-PLANT JPM P2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DONOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



**RO/SROI/SROU IN-PLANT JPM P2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- **The plant is in Mode 5.**
- **A RCS leak has occurred.**
- **The CRS has entered 40EP-9EO11, Lower Mode Functional Recovery Procedure.**
- **The Reactor Operator is performing Appendix 208 Charging Pump Hot Leg Injection Train A HPSI**

INITIATING CUE:

- **The CRS directs you to complete Attachment 208-A Charging Pump A Hot Leg Injection Train A HPSI.**



**RO/SROI/SROU IN-PLANT JPM P2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



**RO/SROI/SROU IN-PLANT JPM P2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

JPM START TIME:

	STEP	CUE	STANDARD
1. *	Step 1: Close BOTH of the following valves: <ul style="list-style-type: none"> CHA-V339, "A" CHARGINGPUMP CHA-P01 DISCHARGE ISOL VALVE" (Charging Pmp A Vlv Gallery) CHA-V316, "A" CHARGING PUMP CHA-P01 SUCTION ISOL VALVE"(Charging Pmp A Vlv Gallery) 	INFORM CUE: CHA-V339 has been rotated clockwise and has stopped moving. CHA-V316 has been rotated clockwise and has stopped moving.	Examinee simulates closing the following valves: <ul style="list-style-type: none"> CHA-V339, "A" CHARGINGPUMP CHA-P01 DISCHARGE ISOL VALVE" (Charging Pmp A Vlv Gallery) CHA-V316, "A" CHARGING PUMP CHA-P01 SUCTION ISOL VALVE"(Charging Pmp A Vlv Gallery)
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
2. *	Step 2: Unlock and open SIE-V508, "CHARGING PUMP'S ALT DISCH TO "A" HPSI HEADER ISOL VALVE". (Charging Pmp A Vlv Gallery)	INFORM CUE: SIE-V508 has been rotated counter-clockwise and has stopped moving.	Examinee simulates unlocking and opening SIE-V508.
SAT / UNSAT Comments (required for UNSAT):			



**RO/SROI/SROU IN-PLANT JPM P2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
3. *	Step 3: Open ALL of the following valves: <ul style="list-style-type: none"> CHB-V327, “RWT TO CHARGING PUMPS SUCTION” (70 ft. East Mechanical Piping Penetration Room) 	INFORM CUE: CHB-V327 has been rotated counter-clockwise and has stopped moving.	Examinee simulates opening CHB-V327.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
4. *	Step 3 (Continued): Open ALL of the following valves: <ul style="list-style-type: none"> CHE-V796, ““A” CHARGING PUMP DISCHARGE CROSSCONNECT TO HPSI VALVE” (Charging Pmp A Vlv Gallery) CHA-V755, ““A” CHARGING PUMP CHA-P01 ALTERNATE SUCTION ISOL VALVE” (Charging Pmp A Vlv Gallery) 	INFORM CUE: CHE-V796 has been rotated counter-clockwise and has stopped moving. CHA-V755 has been rotated counter-clockwise and has stopped moving.	Examinee simulates opening the following valves: <ul style="list-style-type: none"> CHE-V796, ““A” CHARGING PUMP DISCHARGE CROSSCONNECT TO HPSI VALVE” CHA-V755, ““A” CHARGING PUMP CHA-P01 ALTERNATE SUCTION ISOL VALVE”
SAT / UNSAT Comments (required for UNSAT):			



**RO/SROI/SROU IN-PLANT JPM P2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
5.	Step 4: Inform the responsible operator that Attachment 208-A is complete.	INFORM CUE: The CRS has been informed.	Examinee simulates informing the CRS that Attachment 208-A is complete.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



**RO/SROI/SROU IN-PLANT JPM P2
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

APPLICANT

INITIAL CONDITIONS:

- **The plant is in Mode 5.**
- **A RCS leak has occurred.**
- **The CRS has entered 40EP-9EO11, Lower Mode Functional Recovery Procedure.**
- **The Reactor Operator is performing Appendix 208 Charging Pump Hot Leg Injection Train A HPSI**

INITIATING CUE:

- **The CRS directs you to complete Attachment 208-A Charging Pump A Hot Leg Injection Train A HPSI.**

APPLICANT

STANDARD APPENDICES

Attachment 208-A LM-Charging Pump A Hot Leg Injection Train A HPSI

Page 1 of 1

INSTRUCTIONSCONTINGENCY ACTIONS

- ____ 1. Close **BOTH** of the following valves:
- CHA-V339, ““A” CHARGING PUMP CHA-P01 DISCHARGE ISOL VALVE”
(Charging Pmp A Vlv Gallery)
 - CHA-V316, ““A” CHARGING PUMP CHA-P01 SUCTION ISOL VALVE”
(Charging Pmp A Vlv Gallery)
- ____ 2. Unlock and open SIE-V508, “CHARGING PUMP’S ALT DISCH TO “A” HPSI HEADER ISOL VALVE”.
(Charging Pmp A Vlv Gallery)
- ____ 3. Open **ALL** of the following valves:
- CHB-V327, “RWT TO CHARGING PUMPS SUCTION”
(70 ft. East Mechanical Piping Penetration Room)
 - CHE-V796, ““A” CHARGING PUMP DISCHARGE CROSS-CONNECT TO HPSI VALVE”
(Charging Pmp A Vlv Gallery)
 - CHA-V755, ““A” CHARGING PUMP CHA-P01 ALTERNATE SUCTION ISOL VALVE”
(Charging Pmp A Vlv Gallery)
- ____ 4. Inform the responsible operator that Attachment 208-A is complete.

End of Attachment



RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

JPM BASIS INFORMATION

TASK:	12502403041250240304Perform Actions per 40AO-9ZZ24, Deliberate Acts against PVNGS							
TASK STANDARD:	AFA-P01 overspeed trip has been reset and the pump is running at 3560 rpm.							
K/A:	3.4 061 A2.04			K/A RATING:	RO:	3.4	SRO:	3.8
10 CFR 55:	45(a)(3), 45(a)(13)							
APPLICABLE POSITION(S):	SRO/RO		VALIDATION TIME:	30 minutes				
REFERENCES:	40EP-9EO10, Standard Appendices, Appendix 112							
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR			PLANT	X	OTHER		

JPM TYPE

Time Critical? (Yes/No) **No**

Alternative Path? (Yes/No) **Yes**

PRA/SRA related? (Yes/No) **Yes**

APPROVAL

Developed By: Alan Malley Date: 04/09/2010

Revised By: Rusty Quick Date: 03/26/2015

Technical Review _____ Operations Approval _____

Training Approval _____

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE (Circle One) SAT / UNSAT *

* For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation. PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.



**RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

1. SIMULATOR SETUP:

N/A

2. SPECIAL TOOLS/EQUIPMENT:

- Copy of 40EP-9EO10, Standard Appendices, Appendix 112, Rev 88 (although page is marked Rev 82)

3. JPM PERFORMANCE:

N/A



**RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated.
- **DONOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available (procedures, prints, OAPs, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking reference.



**RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

INITIAL CONDITIONS:

- A Delta 10 security event is in progress and the CRS has entered 40AO-9ZZ24, Security Events.
- The Reactor is tripped and the Control Room Supervisor (CRS) has also entered the Functional Recovery Procedure.

INITIATING CUE:

The CRS directs you to perform the following per 40AO-9ZZ24, Deliberate Acts Against PVNGS:

- Travel directly to the AFA-P01 (Auxiliary Feedpump A) pump room.
- Obtain 40EP-9EO10 Standard Appendix 112.
- Obtain a tachometer locally at AFA-P01.
- Standby for further direction from the Control Room.



RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam

INFORMATION FOR EVALUATOR USE:

- An **asterisk (*)** following a JPM Step number denotes a Critical Step.
- At the discretion of the Evaluator, this JPM may be terminated when the **Task Standard** is met or adequate time has been allowed to complete the JPM.
- Any step marked **UNSAT** requires comments.
- If this is the first JPM of the set, then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent the **Task Standard** from being met.
- Notify the **Shift Manager** when in-plant JPMs are being performed.
- **Information CUEs** reflect plant response and do not need to be requested by examinee. If examinee performs incorrect action, the evaluator may give any appropriate cue reflecting plant response as an **Information CUE**.
- **If Requested CUEs** are given when requested by examinee.



**RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

JPM START TIME:

	STEP	CUE	STANDARD
1.	Step 1: Obtain a tachometer from the Delta-10 box located outside the Watertight Fire Door to Turbine Driven AF Pump Room at 80' (C-A-01).	INFORMATION CUE: Give the examinee a copy of Appendix 112.	Examinee locates Delta-10 box outside AFA pump room door.

SAT / UNSAT

Comments (required for UNSAT):

	STEP	CUE	STANDARD
2.	Step 2: Notify CAS/SAS that you are on station at AFA-P01 using radio channel SEC-1.	INFORM CUE: Security has been notified.	Examinee simulates calling Security on the radio.

SAT / UNSAT

Comments (required for UNSAT):

Note and Caution before Step 3:

NOTE -At least one steam source valve (SGA-UV-134 or SGA-UV-138) will be open because of actions taken in 40AO-9ZZ24. The Trip Throttle valve AFA-HV-54 is expected to be tripped because of a loss of control power to the turbine controls.

CAUTION -Failure to wear leather welding sleeves while manually operating AFA-HV-54 may result in personal injury due to steam packing leakage and proximity to hot pipes.



**RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
3.	Step 3: Establish communication with the Control Room via radio or telephone.	INFORM CUE: Contact with the Control Room has been established.	Examinee attempts establishing communications with the Control Room.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
4.	Step 4: WHEN directed by the Control Room to perform this appendix, THEN ensure AFA-HV-54, "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" is closed (REFER TO Attachment 112-A, Trip/Throttle Valve in the Reset Position).	INFORM CUE: The CRS directs you to perform Appendix 112. As examinee inspects AFA-HV-54 inform the examinee that the valve is in the position as in Attachment 112-B. The motor actuator is green light is ON and the red light is OFF.	Examinee inspects AFA-HV-54 to determine position.
SAT / UNSAT Comments (required for UNSAT):			



**RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
2015 NRC Exam**

	STEP	CUE	STANDARD
5. *	Step 5: Open BOTH of the following valves: <ul style="list-style-type: none"> • AFA-V084, “AFN-PI-020 ROOT VALVE”. (AFA-P01 Rm South of Pump) • The instrument Isolation for AFN-PI-20. (AFA-P01 Rm SW corner) 	INFORM CUE: As examinee simulates opening each valve. The valve has rotated counter-clockwise and stopped moving.	Examinee simulates opening both of the following valves: <ul style="list-style-type: none"> • AFA-V084, “AFN-PI-020 ROOT VALVE”. (AFA-P01 Rm South of Pump) • The instrument Isolation for AFN-PI-20. (AFA-P01 Rm SW corner)
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
6. *	Step 6: Open AFA-V131, AFN-PI-055Root Valve. (AFA-P01 Rm LowerLevel North of Turbine)	INFORM CUE: As examinee simulates opening the valve. The valve has rotated counter-clockwise and stopped moving.	Examinee simulates opening AFA-V131
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
7.	Step 7: Check that AFA-HV-54, “AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE” is in the Reset closed position, REFER TO Attachment 112-A, Trip/Throttle Valve in the ResetPosition	INFORM CUE: AFA-HV-54 is as shown in Attachment 112-B. The handwheel will not turn in the clockwise direction.	Examinee inspects AFA-HV-54 OR goes from cue on Step 4 of this JPM. ALTERNATE PATH Start
SAT / UNSAT Comments (required for UNSAT):			



**RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
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	STEP	CUE	STANDARD
8.	<p>Step 7.1.a:</p> <p>Perform the following to reset AFA-HV-54:</p> <p>a. Manually close the actuator for AFA-HV-54 to align the Latch Lever and the Trip Hook. REFER TO Attachment 112-B, Trip/Throttle Valve in the Tripped Position.</p>	<p>IF REQUESTED CUE:</p> <p>The actuator for AFA-HV-54 is in the closed position. The Latch Lever and Trip Hook are aligned.</p>	<p>The examinee determines from Step 4 cue that the actuator for AFA-HV-54 is in the closed position.</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



**RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
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	STEP	CUE	STANDARD
9. *	<p>Step 7.1.b:</p> <p>Perform the following to reset AFA-HV-54:</p> <p>b. WHEN AFA-HV-54 has been closed, THEN pull the Reset Lever toward the Trip/Throttle Valve to completely engage the Latch Lever and the Trip Hook. REFER TO ALL of the following attachments:</p> <ul style="list-style-type: none"> • Attachment 112-A, Trip/Throttle Valve in the Reset Position • Attachment 112-C, Resetting AFA-P01 Overspeed Trip Linkage • Attachment 112-D, Alignment of Trip Tappet Assembly 	<p>INFORM CUE:</p> <p>The Reset Lever has been pulled and the Latch Lever and Trip Hook are completely engaged.</p>	<p>Examinee simulates pulling the Reset Lever toward the Trip/Throttle Valve to engage the Latch Lever and Trip Hook.</p>
<p>SAT / UNSAT Comments (required for UNSAT):</p>			



**RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
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	STEP	CUE	STANDARD
10.	<p>Step 7.1.c:</p> <p>Perform the following to reset AFA-HV-54:</p> <p>c. Perform the following:</p> <ol style="list-style-type: none"> 1) Ensure the Trip Tappet Assy is correctly aligned, REFER TO Attachment 112-D, Alignment of Trip Tappet Assembly. 2) Ensure the Trip Tappet Assy is pushed down to hold the Reset Lever in position. REFER TO Attachment 112-A, Trip/Throttle Valve in the Reset Position. 3) Ensure the Latch Lever and Trip Hook are completely engaged with no visible gaps between the faces of the jaws. 	<p>INFORM CUE:</p> <p>The Trip Tappet Assy is correctly aligned.</p> <p>The Trip Tappet Assy is push down to hold the Reset Lever in position.</p> <p>The Latch Lever and Trip Hook are completely engaged with no visible gaps between the faces of the jaws.</p>	<p>Examinee performs the following</p> <ol style="list-style-type: none"> 1) Assy is correctly aligned, REFER TO Attachment 112-D, Alignment of Trip Tappet Assembly. 2) Pushes down the Trip Tappet Assy to hold the Reset Lever in position. 3) Ensure the Latch Lever and Trip Hook are completely engaged with no visible gaps between the faces of the jaws
<p>SAT / UNSAT</p> <p>Comments (required for UNSAT):</p>			



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	STEP	CUE	STANDARD
11.	Step 7.1.d: Perform the following to reset AFA-HV-54: d. Ensure the Manual Trip Lever is in the reset position. REFER TO Attachment 112-A, Trip/Throttle Valve in the Reset Position.	INFORM CUE: The Manual Trip Lever is “as you see it.”	Examinee simulates ensuring the Manual Trip Lever is in the reset position.
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
12. *	Step 8: Ensure BOTH of the Aux Feed Pump A Feed Isolation Valves are open: <ul style="list-style-type: none"> AFC-UV-36, “AUX FEEDPUMP AFA-P01 FEED ISOLATION VLV TO SG #1”. (90' AFA-P01 Pump Room) AFA-UV-37, “AUX FEEDPUMP AFA-P01 FEED ISOLATION VLV TO SG #2”. (80' AFA-P01 Pump Room) 	INFORM CUE: Provide the following cue after the operator has simulated operating each valve: The clutch has been depressed and the handwheel rotated in the counter-clockwise position. The valve has stopped moving.	The examinee simulates manually opening AFC-UV-36 and AFA-UV-37.
SAT / UNSAT Comments (required for UNSAT):			



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	STEP	CUE	STANDARD
13. *	Step 9: Throttle open AFA-HV-54, “AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE” until ONE of the following parameters is met: <ul style="list-style-type: none">• Pump discharge pressure is 1800 psig on AFN-PI-20.• Turbine speed is 3560 rpm using a hand held tachometer.	INFORM CUE: Pump discharge is reading 1805 psig on the AFN-PI-20. Pump speed is 3560 on the hand held tachometer. Another operator will complete the remainder of this procedure.	Examinee simulates throttling open AFA-HV-54 manually by pressing down on the declutch lever and rotating the manual handwheel in the counter-clockwise direction.
SAT / UNSAT Comments (required for UNSAT):			

JPM STOP TIME:

NORMAL TERMINATION POINT



**RO/SROI IN-PLANT JPM P3
PVNGS JOB PERFORMANCE MEASURE
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APPLICANT

INITIAL CONDITIONS:

- A Delta 10 security event is in progress and the CRS has entered 40AO-9ZZ24, Security Events.
- The Reactor is tripped and the Control Room Supervisor (CRS) has also entered the Functional Recovery Procedure.

INITIATING CUE:

The CRS directs you to perform the following per 40AO-9ZZ24, Deliberate Acts Against PVNGS:

- Travel directly to the AFA-P01 (Auxiliary Feedpump A) pump room.
- Obtain 40EP-9EO10 Standard Appendix 112.
- Obtain a tachometer locally at AFA-P01.
- Standby for further direction from the Control Room.

APPLICANT

This page redacted because it contained operations telephone numbers.

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS

NOTE

At least one steam source valve (SGA-UV-134 or SGA-UV-138) will be open because of actions taken in 40AO-9ZZ24. The Trip Throttle valve AFA-HV-54 is expected to be tripped because of a loss of control power to the turbine controls.

CAUTION

Failure to wear leather welding sleeves while manually operating AFA-HV-54 may result in personal injury due to steam packing leakage and proximity to hot pipes.

- ____ 3. Establish communication with the Control Room via radio or telephone.

- ____ 3.1 **IF** communication with the Control Room can **NOT** be established or maintained, **AND BOTH** of the following pumps are **NOT** running:

- AFA-P01
- AFB-P01

THEN perform the following:

- a. Ensure AFA-HV-54, "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" is closed (REFER TO Attachment 112-A, Trip/ Throttle Valve in the Reset Position).
- b. GO TO step 5.

- ____ 4. **WHEN** directed by the Control Room to perform this appendix, **THEN** ensure AFA-HV-54, "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" is closed (REFER TO Attachment 112-A, Trip/Throttle Valve in the Reset Position).

STANDARD APPENDICES

INSTRUCTIONS

- _____ 5. Open **BOTH** of the following valves:
- AFA-V084, "AFN-PI-020 ROOT VALVE".
(AFA-P01 Rm South of Pump)
 - The instrument Isolation for AFN-PI-20.
(AFA-P01 Rm SW corner)
- _____ 6. Open AFA-V131, AFN-PI-055 Root Valve. (AFA-P01 Rm Lower Level North of Turbine)
- _____ 7. Check that AFA-HV-54, "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" is in the Reset closed position, REFER TO Attachment 112-A, Trip/Throttle Valve in the Reset Position

(continue)

CONTINGENCY ACTIONS

- _____ 7.1 Perform the following to reset AFA-HV-54:
- a. Manually close the actuator for AFA-HV-54 to align the Latch Lever and the Trip Hook. REFER TO Attachment 112-B, Trip/Throttle Valve in the Tripped Position.

(continue)

STANDARD APPENDICES

INSTRUCTIONS

____ 7. (continued)

(continue)

CONTINGENCY ACTIONS

7.1 (continued)

- b. **WHEN** AFA-HV-54 has been closed,
THEN pull the Reset Lever toward the Trip/Throttle Valve to completely engage the Latch Lever and the Trip Hook. REFER TO ALL of the following attachments:
- Attachment 112-A, Trip/Throttle Valve in the Reset Position
 - Attachment 112-C, Resetting AFA-P01 Overspeed Trip Linkage
 - Attachment 112-D, Alignment of Trip Tappet Assembly
- c. Perform the following:
- 1) Ensure the Trip Tappet Assy is correctly aligned, REFER TO Attachment 112-D, Alignment of Trip Tappet Assembly.
 - 2) Ensure the Trip Tappet Assy is pushed down to hold the Reset Lever in position. REFER TO Attachment 112-A, Trip/Throttle Valve in the Reset Position.
 - 3) Ensure the Latch Lever and Trip Hook are completely engaged with no visible gaps between the faces of the jaws.

(continue)

STANDARD APPENDICES

INSTRUCTIONS

____ 7. (continued)

____ 8. Ensure **BOTH** of the Aux Feed Pump A Feed Isolation Valves are open:

- AFC-UV-36, "AUX FEEDPUMP AFA-P01 FEED ISOLATION VLV TO SG #1". (90' AFA-P01 Pump Room)
- AFA-UV-37, "AUX FEEDPUMP AFA-P01 FEED ISOLATION VLV TO SG #2". (80' AFA-P01 Pump Room)

____ 9. Throttle open AFA-HV-54, "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" until **ONE** of the following parameters is met:

- Pump discharge pressure is 1800 psig on AFN-PI-20.
- Turbine speed is 3560 rpm using a hand held tachometer.

CONTINGENCY ACTIONS

7.1 (continued)

- d. Ensure the Manual Trip Lever is in the reset position.
REFER TO Attachment 112-A, Trip/Throttle Valve in the Reset Position.

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS

NOTE

The intent is to establish both a turbine speed of 3560 rpm and pump discharge of 1400-1410 psig (for a 10 minute duration) to ensure the SGs receive adequate feedwater. This may require adjusting feed and steam valves more than once to achieve the target discharge pressure and turbine speed.

_____ 10. **WHEN** at least **ONE** of the following is established,

- Pump discharge pressure is 1800 psig on AFN-PI-20.
- Turbine speed is 3560 rpm.

THEN perform **BOTH** of the following:

- a. Throttle open **BOTH** of the following valves an equal amount until AFN-PI-20 indicates 1400-1410 psig:
 - AFA-HV-32, "AUX FEEDPUMP AFA-P01 FLOW CONTROL VLV TO SG #1" (90' AFA-P01 Pump Room)
 - AFC-HV-33, "AUX FEEDPUMP AFA-P01 FLOW CONTROL VLV TO SG #2" (80' AFA-P01 Pump Room)
- b. Adjust AFA-HV-54, "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" to control turbine speed to 3560 rpm.

_____ 10.1 **IF** SG level instrumentation has been restored,
THEN control the SG feed rate at the direction of the Control Room.

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS

NOTE

The intent is to establish both a turbine speed of 3560 rpm and pump discharge of 1680-1690 psig (for a 15 minute duration) to ensure the SGs receive adequate feedwater. This may require adjusting feed and steam valves more than once to achieve the target discharge pressure and turbine speed.

CAUTION

Throttling the flow control valves to reduce feed flow will cause the turbine speed to increase potentially challenging an overspeed trip at 4008-4108 rpm.

____ 11. **WHEN** discharge pressure has been established for 10 minutes at 1400-1410 psig on AFN-PI-20, **THEN** perform **BOTH** of the following:

a. Throttle **BOTH** of the following valves an equal amount until AFN-PI-20 indicates 1680-1690 psig:

- AFA-HV-32, "AUX FEEDPUMP AFA-P01 FLOW CONTROL VLV TO SG #1" (90' AFA-P01 Pump Room)
- AFC-HV-33, "AUX FEEDPUMP AFA-P01 FLOW CONTROL VLV TO SG #2" (80' AFA-P01 Pump Room).

b. Adjust AFA-HV-54, "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" to control turbine speed to 3560 rpm.

____ 11.1 **IF** SG level instrumentation has been restored, **THEN** control the SG feed rate at the direction of the Control Room.

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS

NOTE

The intent is to establish both a turbine speed of 3560 rpm and pump discharge of 1730-1740 psig (for the remaining duration) to ensure the SGs receive adequate feedwater. This may require adjusting feed and steam valves more than once to achieve the target discharge pressure and turbine speed.

CAUTION

Throttling the flow control valves to reduce feed flow will cause the terry turbine speed to increase potentially challenging an overspeed trip at 4008-4108 rpm.

_____ 12. **WHEN** pressure has been established for 15 minutes at 1680-1690 psig on AFN-PI-20, **THEN** perform **BOTH** of the following:

- a. Throttle **BOTH** of the following valves an equal amount until AFN-PI-20 indicates 1730-1740 psig:
 - AFA-HV-32, "AUX FEEDPUMP AFA-P01 FLOW CONTROL VLV TO SG #1" (90' AFA-P01 Pump Room)
 - AFC-HV-33, "AUX FEEDPUMP AFA-P01 FLOW CONTROL VLV TO SG #2" (80' AFA-P01 Pump Room).
- b. Adjust AFA-HV-54, "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" to control turbine speed to 3560 rpm.

_____ 12.1 **IF** SG level instrumentation has been restored, **THEN** control the SG feed rate at the direction of the Control Room.

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS----- NOTE -----

If operating AFA-P01 from Main Steam and the Steam Generators are overfilled, AFA-P01 will trip due to water in the steam line. The parameters (controlling to pump discharge pressure, speed and duration) used in this appendix are expected to maintain SG level in the WR band (60-70% WR)

- _____ 13. **IF** the feedpump turbine trips on overspeed,
THEN perform the following:
- a. Reset AFA-HV-54 "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" per contingency step 7.1 in this Appendix.
 - b. **IF** the feedpump turbine tripped on overspeed due to water in the steam line,
AND 30 minutes has elapsed after the overspeed trip,
THEN restore feed flow.

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS

____ 14. **IF ANY** of the following symptoms occur:

- Discharge pressure fluctuates widely (AFN-PI-20),
- Cavitation noises,
- Large variations in pump discharge pressure with a constant steam pressure,
- Large variations in turbine speed with a constant steam pressure,

THEN perform the following to realign the suction to the RMWT:

- a. Manually trip AFA-P01.
- b. Open AFA-V058, "AUX FEEDPUMP AFA-P01 RMWT SUCTION ISOLATION VALVE". (Above AFA-P01 88 ft. MSSS)
- c. Unlock and close AFA-V006, "AUX FEEDPUMP AFA-P01 CST SUCTION ISOLATION VALVE". (Above AFA-P01 88 ft. MSSS)
- d. Vent at AFA-V091 to remove non-condensable gasses from the AFA-P01 suction line.

(continue)

STANDARD APPENDICES

INSTRUCTIONSCONTINGENCY ACTIONS

____ 14. (continued)

- e. Reset AFA-HV-54 "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" per contingency step 7.1 in this Appendix.
- f. Throttle open AFA-HV-54, "AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE" to adjust turbine speed to 3560 rpm.

____ 15. **IF** SG level instrumentation has been restored,
THEN control the SG feed rate at the direction of the Control Room.

End of Appendix

STANDARD APPENDICES

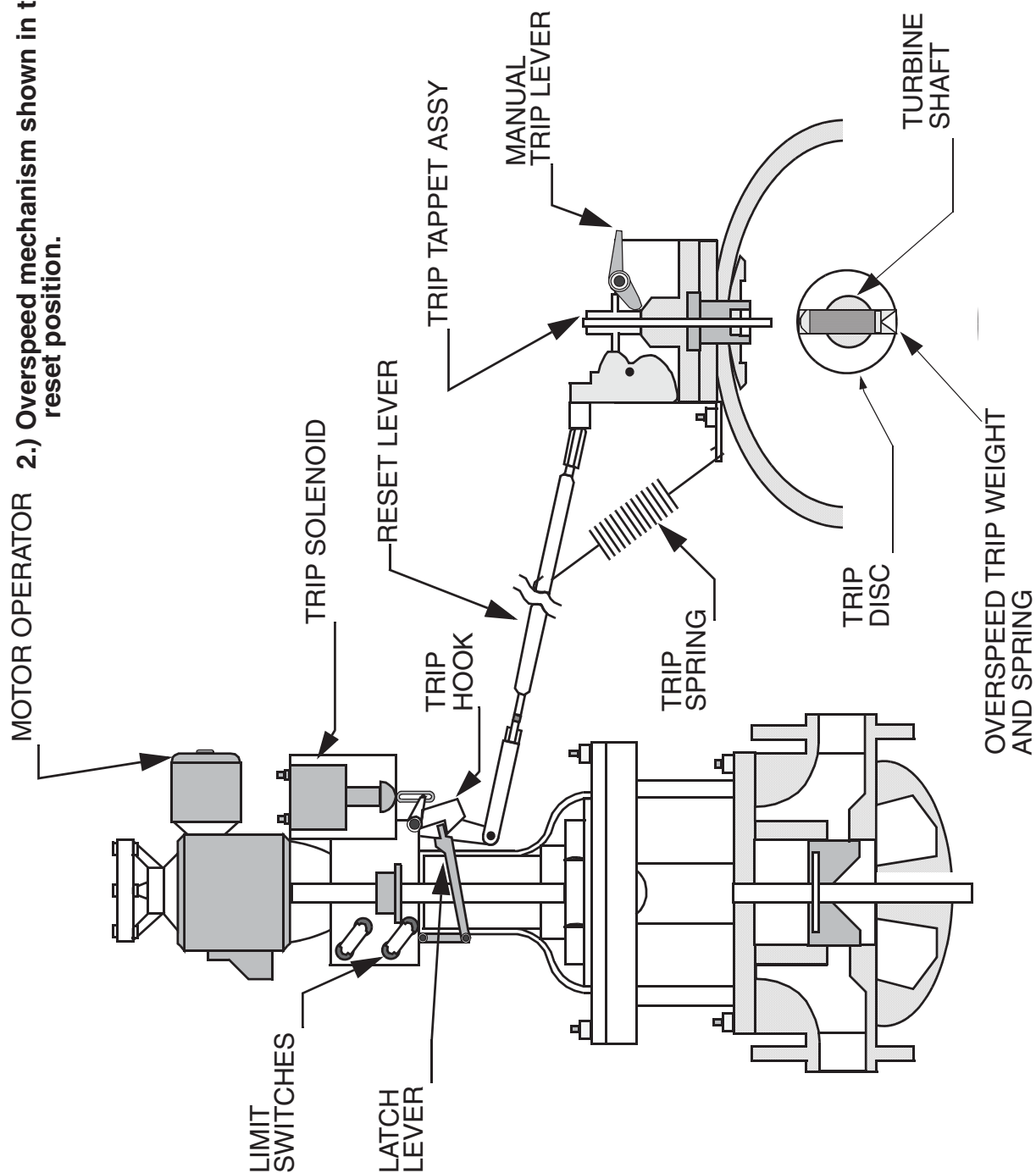
Attachment 112-A

Trip/Throttle Valve in the Reset Position

Page 1 of 1

1.) Trip/Throttle Valve shown in the reset position. Valve closed with Latch Lever engaged with Trip Hook.

2.) Overspeed mechanism shown in the reset position.



End of Attachment

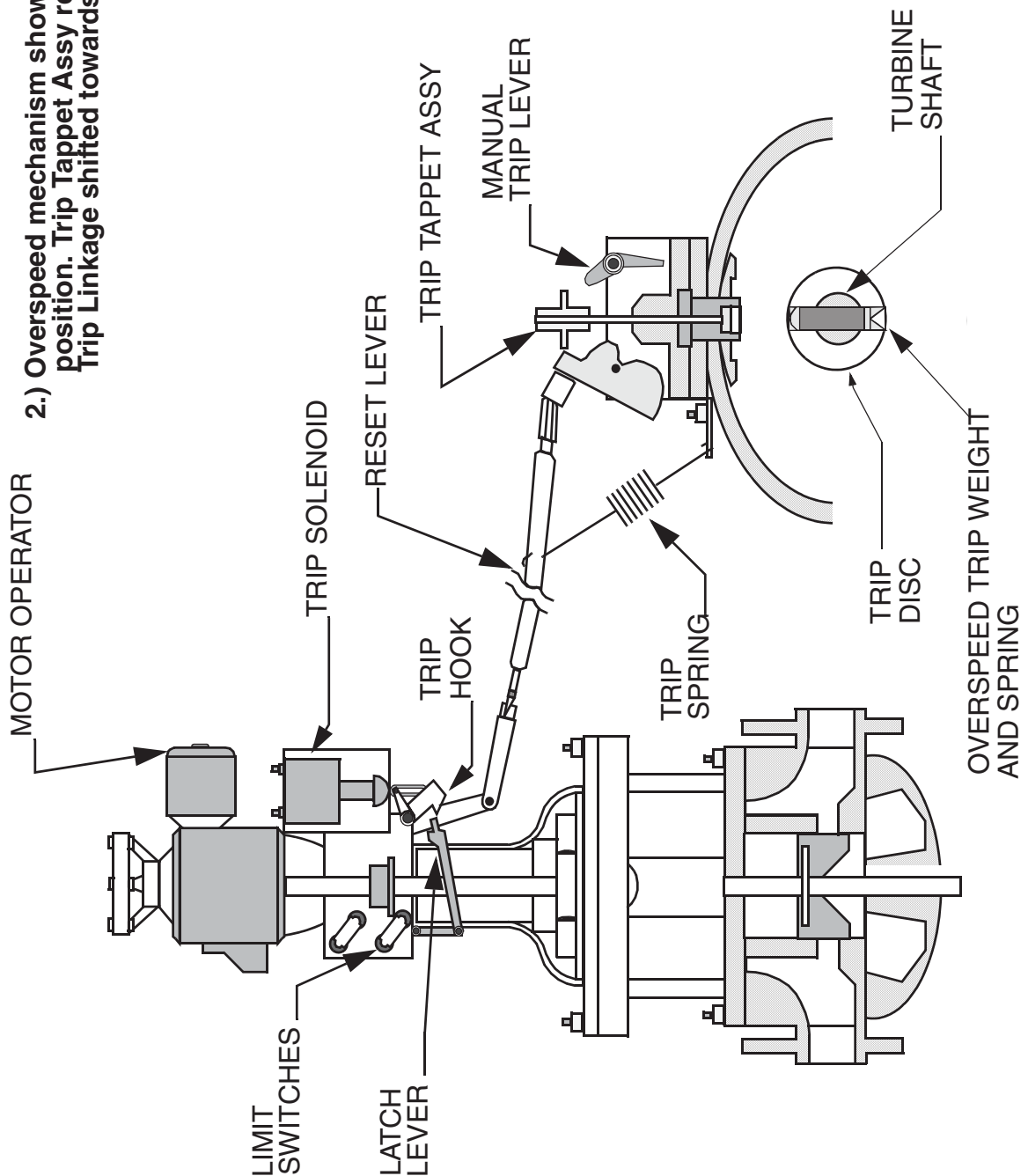
STANDARD APPENDICES

Attachment 112-B

Trip/Throttle Valve in the Tripped Position

Page 1 of 1

- 1.) Trip/Throttle Valve shown in the after overspeed trip position. Valve closed with Latch lever up.
- 2.) Overspeed mechanism shown in the trip position. Trip Tappet Assy released and Trip Linkage shifted towards turbine.



End of Attachment

STANDARD APPENDICES

Attachment 112-C

Resetting AFA-P01 Overspeed Trip Linkage

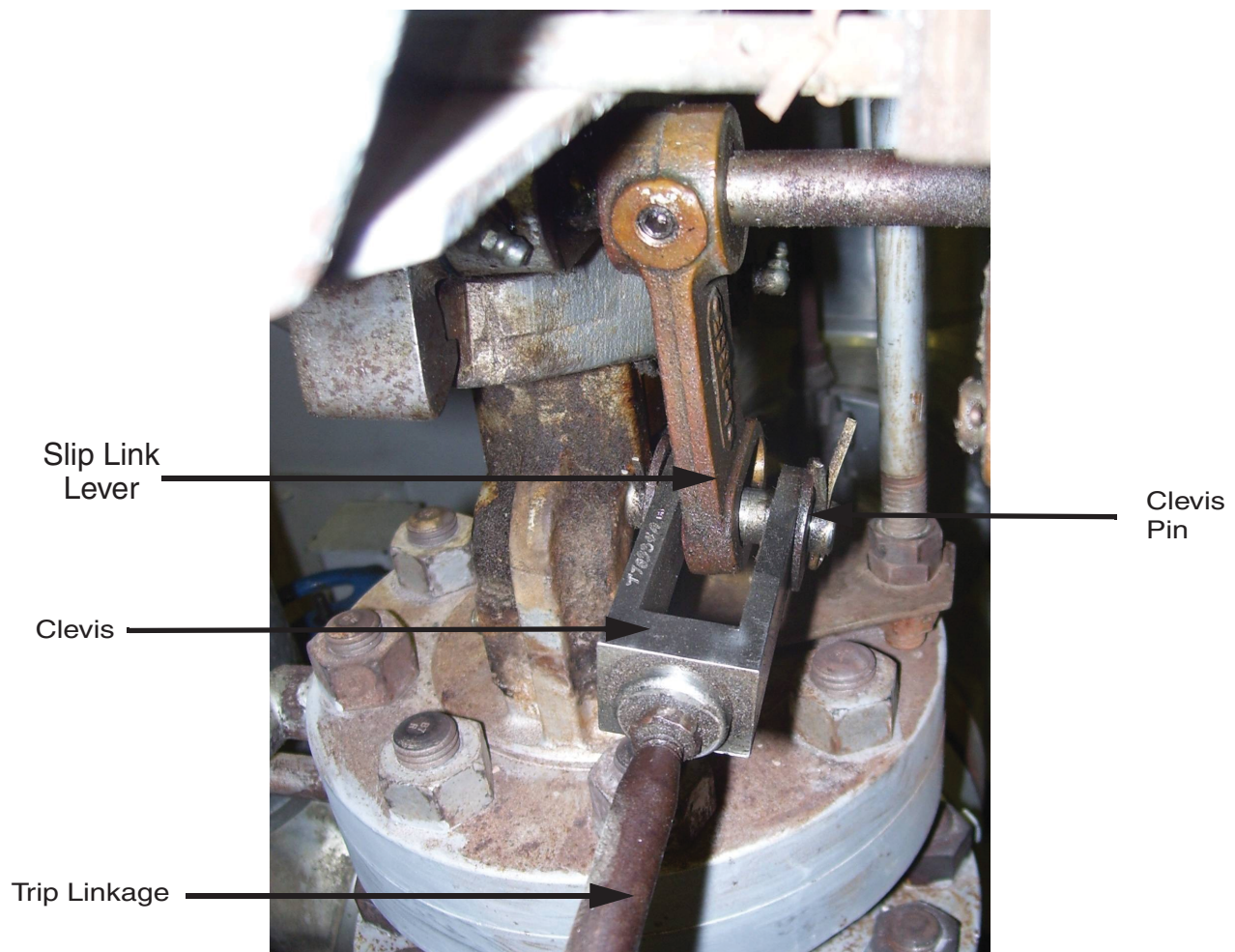
Page 1 of 1

NOTE

Care should be taken to **NOT** grab the Trip Spring Adjustment Plate on the Reset Lever when resetting the turbine.

NOTE

Care should be taken to **NOT** allow the Clevis Pin to impact the back edge of the Slip Link Lever when the Reset Lever is pushed/pulled toward the Trip/Throttle valve.

**End of Attachment**

STANDARD APPENDICES

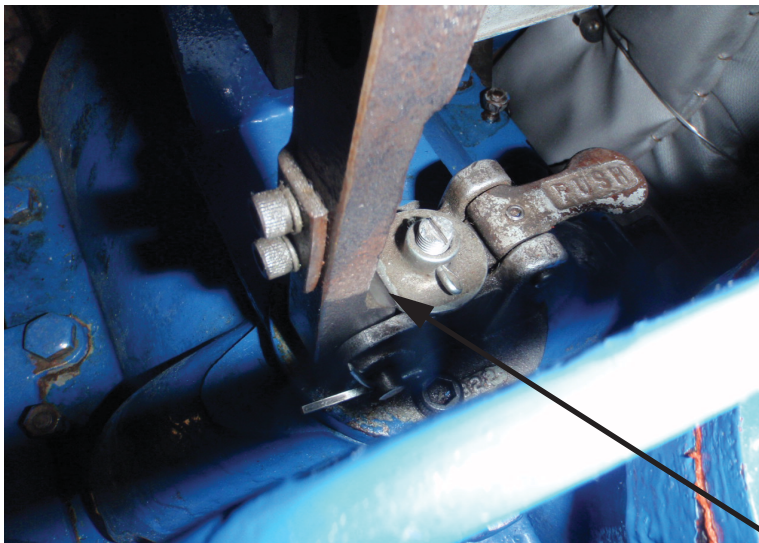
Attachment 112-D

Alignment of Trip Tappet Assembly

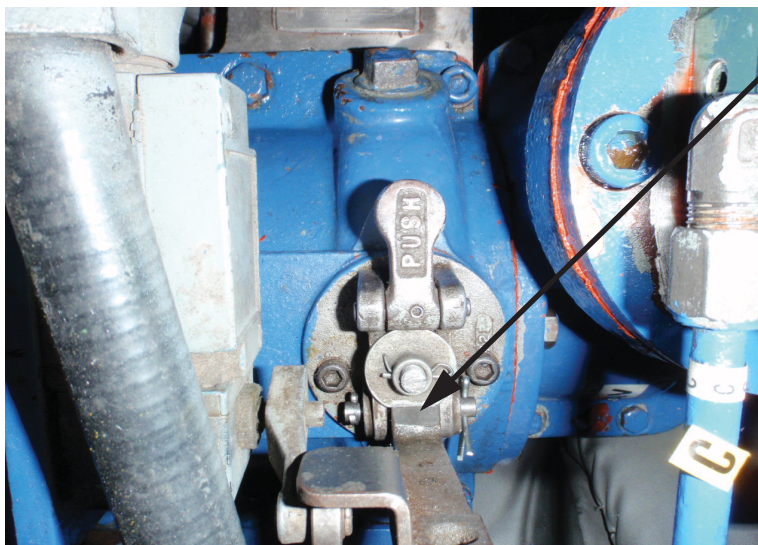
Page 1 of 1

NOTE

The Tappet is susceptible to bending if the Tappet Nut is impacted with enough force. The Reset Lever should be slowly returned to rest on the Tappet Nut after the Linkage is reset with the flat edge of the trip tappet assembly aligned closest to the reset lever.



Flat edge of
Trip Tappet
Assembly

**End of Attachment**

Facility: <u>PVNGS</u>	Scenario No.: <u>1 (Rev. 2)</u>	Op-Test No.: <u>NRC - 2015</u>
Examiners: _____		Operators: _____
_____		_____
_____		_____
Initial Conditions: (100% power, MOC). Turnover: See attached.		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N BOP/SRO	Secure and isolate SG Blowdown from SG #1 1 in accordance with 40OP-9SG03, Operating the Steam Generator Blowdown System, Section 5.3.
2	cmCNCV01CHEPDIC240_2	C RO/SRO	CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, fails LOW in the AUTO Mode. Crew responds in accordance with 40AL-9RK3A for 3A08A and 3A11B. Window 8A, Group C (PT ID CHPDS240).
3	mfAN_1B01A4	C RO/SRO	Auxiliary Transformer High Temperature. Crew responds in accordance with 40AL-9RK1B, window 1B01A (Point ID MAY57, Unit Aux Xfmr MAN-X02 Trouble). The RO directs an Area Operator to locally investigate the trouble alarm. The AO uses 40AL-9MA01, UNIT AUX TRANSFORMER MAN-X02, Group H, High Winding Temp.
4	mfFW17B	C RO/BOP/ SRO (AOP)	'B' MFP trips, Reactor Power Cutback. The CRS implements 40AO-9ZZ09, Reactor Power Cutback (Loss of Feedpump), Section 3.0, Loss of Feedpump. [LCO 3.2.4, Condition A]
5	mfRP06L1 mfRP06L2 cmCPFW07AFBP01_6	C BOP/SRO (AOP/TS)	Inadvertent AFAS-1 Train B & AFB-P01 86 Lockout. Crew responds in accordance with 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations, Section 3.0, AFAS. [LCO 3.7.5, Condition C]
6	mfMC01A	M ALL	Loss of condenser vacuum (Trip Initiator). Crew should initiate a manual Reactor trip and enter 40EP-9EO01, Standard Post Trip Actions. The most likely initial diagnosis results in a transition to 40EP-9EO02, Reactor Trip.
7	cmCNRC03RCNPIC100_2	C RO/SRO	RCN-PIC-100, Pressurizer Master Controller, fails to 100% output in the AUTO mode. RO responds in accordance with ARP for B04 window B401B (PZR PRESS HI-LO), Group A, Pressurizer Pressure Ch X(Y) Lo. (CRITICAL TASK: Close Pressurizer Spray Valves before a SIAS occurs at 1837 psig.)

8	cmCPFW07AFNP01_6	M ALL	<p>Loss of Feedwater 86 Lockout of AFN-P01.</p> <p>With the loss of vacuum disabling the MFPs, malfunctions of AFB and AFN, and AFA out of service; this results in a Loss of All Feedwater and the CRS rediagnoses the event. The CRS may initially transition to 40EP-9EO06, Loss of All Feedwater, and progress until Step 6. Since Step 6 cannot be accomplished, Contingency Action 6.1 directs a transition to 40EP-9EO09, Functional Recovery.</p> <p>(CRITICAL TASK: Establish a feed source to at least one steam generator to ensure restoration of level toward the normal band prior to lifting a primary safety valve.)</p>
End point			<p>The scenario may be ended once the selected Steam Generator is being fed to at a rate that raises SG level, and/or lowers/stabilizes RCS temperature, OR when deemed appropriate by the Lead Examiner.</p>
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	7
2. Malfunctions after EOP entry (1-2)	2
3. Abnormal events (2-4)	2
4. Major transients (1-2)	2
5. EOPs entered/requiring substantive actions (1-2)	1
6. EOP contingencies requiring substantive actions (0-2)	1
7. Critical tasks (2-3)	2

CRITICAL TASK	JUSTIFICATION	REFERENCES
Close the Pressurizer Spray Valves before a SIAS occurs at 1837 psig.	<p>Failure to close the Pressurizer Spray Valves prior to RCS pressure lowering to less than 1837 psig will result in a loss of subcooling, which could require securing all RCPs, unnecessarily complicating recovery strategies. 40DP-9AP06, SPTAs Technical Guidelines, Instruction Step: 5 RCS Pressure Control, Contingency Action 5.3, states: "Maintaining RCPs in operation supports the use of main PZR spray to depressurize to the point of HPSI injection if needed, provided there is adequate subcooling and RCP operating limits are maintained. It will also prevent needlessly stopping forced circulation cooling when significant leakage does not exist."</p> <p>Additionally, allowing a SIAS to unnecessarily actuate will also complicate mitigation strategies, as the crew will be required to shutdown unneeded equipment while implementing the FRP.</p>	<ul style="list-style-type: none"> PVNGS Critical Task RXTP-2, With a failure of PPCS to operate automatically, operate Pressurizer Heaters and Spray and maintain RCS pressure control within limitations as specified by the RCS Pressure-Temperature Curves. CE SPTA-05 (CT-06), Establish RCS Pressure Control. 40DP-9AP06, SPTAs Technical Guidelines, Instruction Step: 5 RCS Pressure Control, Contingency Action 5.3
Establish a feed source to at least one steam generator to ensure restoration of level toward the normal band prior to lifting a primary safety valve.	<p>Failure to prevent dry-out in a SG leads to unnecessary complications in recovery strategy. When SG mass is reduced below 5000 lbm (see FSAR Section 15.2.8.2.3, part of Decrease in Heat Removal By the Secondary System), feedwater flow to that SG must be limited to prevent thermal shock, slowing recovery efforts. Standard Appendix 44, Feeding with the Condensate Pumps, Step 14.d (and 15.d), limits feed flow rate to 1000 gpm if a SG is dry. Excessive feedwater flow to a hot, dry SG can lead to structural damage to SG components (degradation of a fission product barrier), limiting the ability of the SG to remove heat from the RCS. According to 40OP-9SG02, Operating the SGs, Precaution and Limitation 3.7, there are about 16,000 gallons of water in the SG at 0%WR level.</p>	<ul style="list-style-type: none"> PVNGS Critical Task LOAF-2, Establish a feed source to at least one steam generator to ensure restoration of level toward the normal band prior to lifting a primary safety valve. CE HR-01 (CT-08), Establish RCS Heat Removal. FSAR Section 15.2.8.2.3, part of Decrease in Heat Removal By the Secondary System) 40DP-9AP17, Standard Appendices Technical Guideline, Appendix 44.

2015 NRC Scenario 1 Overview

Event 1	<p>Secure and isolate SG Blowdown from SG #1 in accordance with 40OP-9SG03, Operating the Steam Generator Blowdown System, Section 5.3. This normal evolution involves entering new Blowdown Constants into the new Core Monitoring Computer per Appendix O. The BOP places SCN-HS-1, Steam Generator 1 Blowdown Path Selector, to the OFF position to stop flow. The BOP then verifies system response using Appendix G, Blowdown Verifications (per the “Stopping B/D” column). An AO is dispatched to perform a local lineup per Appendix I, Securing Steam Generator 1 Blowdown. The BOP will then close the SG 1 Blowdown Containment Isolation Valves (UV-500P/Q) and the 3 SG 1 Isolation Valves (HV-43, 41, 47). Cooling water to the Blowdown Heat Exchanger will remain in service.</p> <p>When SGE-HV-47 is closed, the next event may be initiated.</p>
Event 2	<p>CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, fails LOW in the AUTO Mode. The crew is alerted by the following:</p> <ul style="list-style-type: none"> • Annunciators: <ul style="list-style-type: none"> ○ 3A08A (CHG HDR SYS TRBL) ○ 3A11B (RCP SEAL INJ FLOW HI-HI OR LO) • This is a reverse-acting controller in that the actual DP goes low when the controller fails to 100% output. • As the DP in the charging header drops, RCP seal injection flow will lower to less than 6 gpm. <p>Crew responds in accordance with 40AL-9RK3A for 3A08A and 3A11B. Window 8A, Group C (PT ID CHPDS240) directs the RO to take manual control of CHN-PDIC-240 and raise the DP to between 90 and 135 psid. The actions for window 11B require the RO to adjust affected RCP seal injection controllers and/or CHN-PDIC-240 to achieve charging header pressure between 2430 and 2500 psig and RCP seal injection flow between 6.0 and 7.5 gpm. The CRS may refer to 40AO-9ZZ04, Reactor Coolant Pump Emergencies.</p> <p>When seal injection flow and charging header pressure are adjusted, or at the discretion of the Lead Examiner, the next event can be initiated.</p>
Event 3	<p>Unit Auxiliary Transformer High Temperature. The crew is alerted by the following:</p> <ul style="list-style-type: none"> • Annunciator 1B01A (UNIT AUX XFMR X02 PROT TRIP/TRBL) • Computer Point ID MAY57, Unit Aux Xfmr MAN-X02 Trouble <p>Crew responds in accordance with 40AL-9RK1B, window 1B01A (Point ID MAY57, Unit Aux Xfmr MAN-X02 Trouble). The RO directs an Area Operator to locally investigate the trouble alarm. The AO uses 40AL-9MA01, UNIT AUX TRANSFORMER MAN-X02, Group H, High Winding Temp. The AO reports that winding temperature is 125°C and rising slowly. The AO also reports that all fans and oil pumps are operating. In accordance with Operator Action 4, the AO recommends a reduction in Unit Aux Xfmr load or a transfer to the alternate power source. 40AL-9RK1B, Point ID MAY57, Unit Aux Xfmr MAN-X02 Trouble, Operator Action 4 prompts the crew to transfer bus NAN-S01 to NAN-S03 and bus NAN-S02 to NAN-S04, then refer to 40OP-9NA03, 13.8 kV Electrical System (NA), Section 7.0 and 11.0. Transfer actions involve placing the Synchronizing Switch to ON, closing the associated tie</p>

2015 NRC Scenario 1 Overview

	<p>breaker, ensuring the supply breaker opens, checking for proper voltage, and turning off the Synchronizing Switch. When loads have been transferred, the AO reports that winding temperature on the Auxiliary Transformer is lowering slowly.</p> <p>After the report from the AO, or at the discretion of the Lead Examiner, the next event can be initiated.</p>
Event 4	<p>'B' MFP trips. Operators are alerted to the trip by the following:</p> <ul style="list-style-type: none"> • Annunciator 6A09A (FWPT B TRIP) • Annunciator 4A11B (REAC PWR CUTBACK) <p>The CRS implements 40AO-9ZZ09, Reactor Power Cutback (Loss of Feedpump), Section 3.0, Loss of Feedpump. On the cutback, CEA Groups 4 and 5 fully insert into the core, the Main Turbine sets back to approximately 60%, the runback circuit lowers load to match the secondary plant to the primary, and the Reactor Regulating System inserts CEAs to respond to the initial increase in Tave. Section 3.0 requires the crew to verify that subgroups 4, 5, and 22 have inserted and that Main Turbine load is less than 65%. The STA (or a designated Operator) performs Appendix D, Status Check RPCB Loss of Feedwater Pump. The BOP raises the Speed Bias on the operating MFP to zero or more and the BOP or RO checks that the RRS is adjusting CEAs to restore Tave/Tref to within 3°F. The Steam Bypass Control System (SBCS) is checked to ensure that main steam pressure is being controlled at setpoint. (SBCVs are not expected to be open at this point). The RO or BOP takes the RPCS out of service and the BOP reduces the load limit potentiometer until the potentiometer has control of the Main Turbine control valves. The BOP/RO places CEDMCs in Manual Sequential. The RO starts boron equalization.</p> <p>After the RO has started the boron equalization, or at the discretion of the Lead Examiner, the next event may be initiated.</p>
Event 5	<p>An inadvertent AFAS-1 Train B occurs and AFB-P01 fails due to an 86 lockout. Since AFA-P01 is out of service, it will not auto-start as designed. Crew responds in accordance with 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations, Section 3.0, AFAS. This section directs the crew to override and operate AFW valves as necessary to control SG levels. 2 minutes after the AFW valves are closed, AFB will trip on an 86 Lockout. Chemistry is informed that Blowdown lights 1 and 2 are isolated and Blowdown constants are updated. Once Blowdown constants have been updated in the CMC and PC, the next event may be initiated.</p> <p>With the failure of AFB-P01, the CRS enters Condition C of TS 3.7.5, since two trains of AFW (AFA tagged out, AFB failed) are now inoperable.</p> <p>After the CRS briefs the crew on entry into Condition C of LCO 3.7.5, or at the discretion of the Lead Examiner, the next event may be initiated.</p>
Event 6	<p>A loss of condenser vacuum occurs. This is a significant loss of vacuum; hence, no substantial action will be taken in Loss of Vacuum AOP prior to initiation of a Reactor trip. Crew should initiate a manual Reactor trip and enter 40EP-9EO01, Standard Post Trip Actions. This is the entry procedure for the Emergency Operating (EOP) System. This procedure is used for any event which actuates or requires a reactor trip. The crew checks each Safety Function and performs the Contingency Actions as required. Once the SPTAs are complete, the CRS selects the appropriate recovery procedure using the Diagnostic flowchart in 40EP-9EO01. The most likely initial diagnosis results in a transition to 40EP-9EO02, Reactor Trip.</p>

2015 NRC Scenario 1 Overview

Event 7	<p>RCN-PIC-100, Pressurizer Master Controller, fails to 100% output in the AUTO mode, which causes both Pressurizer Spray Valves to open 100%. RO responds in accordance with ARP for B04 window B401B (PZR PRESS HI-LO), Group A, Pressurizer Pressure Ch X(Y) Lo. If the main spray valves are <u>not</u> closed, First Priority Operator Action 5 requires the operator to take manual control of RCN-PIK-100, Pressure Spray Control, and close the main spray valves. Recovery actions are also addressed in general terms in the SPTAs (Contingency Action 5.1) if the RCS Pressure Control acceptance criteria are not met.</p> <p>CRITICAL TASK: Close the Pressurizer Spray Valves before a SIAS occurs at 1837 psig.</p> <p>When the main spray valves are closed, or at the discretion of the Lead Examiner, the next event may be initiated.</p>
Event 8	<p>The CRS progresses through 40EP-9EO02, Reactor Trip, until Step 9, when AFN-P01 trips on an 86 lockout. With the loss of vacuum disabling the MFPs, malfunctions of AFB and AFN, and AFA out of service; this results in a Loss of All Feedwater and the CRS rediagnoses the event. The CRS may initially transition to 40EP-9EO06, Loss of All Feedwater, and progress until Step 6. Since Step 6 cannot be accomplished, Contingency Action 6.1 directs a transition to 40EP-9EO09, Functional Recovery. If the CRS recognizes that the FRP is the only procedure with guidance for establishing feedwater flow from the Condensate Pumps, he/she may transition directly to 40EP-9EO09. The CRS then implements 40EP-9EO09, Functional Recovery, to establish feedwater from the Condensate Pumps using Standard Appendix 44, Feeding with the Condensate Pumps. This Appendix involves selecting a SG to depressurize, lining up that SG's downcomer to accept flow, isolating that SG's economizer, tripping the FWPs, lining up feedwater heaters, ensuring adequate RCS makeup flow, and depressurizing the selected SG using atmospheric dump valves (ADVs). The CRS may elect to conserve inventory in the unselected SG by isolating it.</p> <p>CRITICAL TASK: Establish feedwater flow from the Condensate Pumps and feed the selected/depressurized SG prior to opening of the primary safeties.</p> <p>EXAMINER NOTE:</p> <p>Appendix 44 directly relates to Key Operator Action #7 (1.5%) of the PRA: Depressurize Steam Generators and Supply Alternate Feedwater.</p>
End Point	<p>The scenario may be ended once the selected Steam Generator is being fed to at a rate that raises SG level, and/or lowers/stabilizes RCS temperature, OR at the discretion of the Lead Examiner.</p>

TURNOVER**Plant Conditions:**

- Unit 1 is at 100% power
- The core is presently at 250 EFPD
- Risk Management Action Level is ORANGE
- AFA-P01 is out of service for unscheduled maintenance
- AFN-P01 and AFB-P01 are protected
- PC is NOT recircing the RWT
- Unit 2 is supplying the Aux Steam cross-tie header

Equipment Out of Service:

- AFA-P01 is under clearance for maintenance. LCO 3.7.5, Condition A and Condition B, have been entered. The pump is expected to return to service in 8 hours.

Planned Shift Activities:

- To support maintenance on SCN-HV-1A, SG #1 Normal Rate Blowdown Flow Control Valve, secure and isolate Steam Generator Blowdown from SG #1 in accordance with 40OP-9SG03, Operating the Steam Generator Blowdown System, Section 5.0. Cooling water to the Blowdown Heat Exchanger will remain in service. The clearance also will require the Containment Isolation Valves to be closed due to known leaking manual isolation valves. Chemistry has been briefed and has concurred with this approach.

Op-Test No.: **2015 NRC** Scenario No.: **1 (Rev. 1)** Event No.: **1**

Event Description: **Secure and isolate SG Blowdown from SG #1**

Time	Position	Applicant's Actions or Behavior
	CRS	Directs BOP to secure and isolate SG #1 blowdown. Examiner Note: This event may lower power to less than 100%.

40OP-9SG03, Operating the Steam Generator Blowdown System, Section 5.3.

	BOP	<p style="text-align: center;">NOTE</p> <p>Instructions for changing blowdown constants with the new CMC are contain in Appendix O - Inserting Blowdown Constants with the New CMC. The instructions for changing blowdown constants with the new PC are contained in Appendix P – Inserting Blowdown Constants with the New PC.</p>
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Op-Test No.: **2015 NRC** Scenario No.: **1 (Rev. 1)** Event No.: **1**

Event Description: **Secure and isolate SG Blowdown from SG #1**

Time	Position	Applicant's Actions or Behavior
	BOP/RO	<p>Instructions 5.3.1.1 and 5.3.1.2</p> <p>Perform ALL of the following:</p> <p>Concurrent Verification is required for this step.</p> <p>Insert zero for the Blowdown COLSS Constant (NKBMF1 for SG 1) into the Core Monitoring Computer.</p> <div style="text-align: right;">_____ / _____ / _____</div> <div style="display: flex; justify-content: space-between;">1st VerifierDateTime</div> <div style="text-align: right;">_____ / _____ / _____</div> <div style="display: flex; justify-content: space-between;">2nd VerifierDateTime</div> <p>2. Concurrent Verification is required for this step.</p> <p>Insert zero for the Blowdown COLSS Constant (NKBMF1 for SG 1) into the Plant Monitoring Computer.</p> <div style="text-align: right;">_____ / _____ / _____</div> <div style="display: flex; justify-content: space-between;">1st VerifierDateTime</div> <div style="text-align: right;">_____ / _____ / _____</div> <div style="display: flex; justify-content: space-between;">2nd VerifierDateTime</div> <p>Expected Action: BOP enters “0” into CMC and PMC.</p>
	BOP	<p>Instruction 5.3.1.3</p> <p>Place SCN-HS-1, Steam Generator 1 Blowdown Path Selector, to the OFF position.</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1 (Rev. 1)** Event No.: **1**

Event Description: **Secure and isolate SG Blowdown from SG #1**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 5.3.1.4</p> <p>PERFORM Appendix G - Blowdown Verifications to ensure normal system response.</p> <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 5.3.2</p> <p>Direct a Nuclear Operator to perform Appendix I - Securing Steam Generator 1 Blowdown. (N/A at CRS/Shift Managers discretion if blowdown stopped for short duration)</p> <p>Expected Action: As directed.</p>
	BOP	<p style="text-align: center;">NOTE</p> <p>When the BFT cools down, water could flow from the feedwater heaters through SCNLV3A into the BFT causing water hammers.</p>
	BOP	<p>Instruction 5.3.3</p> <p>IF ALL of the following conditions exists:</p> <ul style="list-style-type: none"> • Blowdown flow to the BFT has been secured, • The BFT will be secured over shift change, • CRS/Shift Manager directs, <p>THEN close SCN-V057, BFT Drain to Feedwater Heaters.</p> <p>Expected Action: N/A. With SG #2 blowdown still going to the BFT, SCN-V057 will not be closed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1 (Rev. 1)** Event No.: **1**

Event Description: **Secure and isolate SG Blowdown from SG #1**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: center;">CAUTION</p> <p>Initiating blowdown flow when the containment isolation valves have been closed and the downstream lines are drained or have become voided due to system leakage, may result in severe water hammer to the downstream piping.</p>
	BOP	<p>Instruction 5.3.4</p> <p>At the discretion of the CRS/Shift Manager, close the following valves:</p> <ul style="list-style-type: none">• SGA-UV-500P, Steam Generator 1 Common Upstream Isolation using SGA-HS-500P.• SGB-UV-500Q, Steam Generator 1 Common Downstream Isolation using SGB-HS-500Q.• SGE-HV-43, Steam Generator 1 Hot Leg Isolation Valve using SGN-HS-43.• SGE-HV-41, Steam Generator 1 Cold Leg Isolation Valve using SGN-HS-41.• SGE-HV-47, Steam Generator 1 Downcomer Isolation Valve using SGN-HS-47. <p>Expected Action: RO closes UV-500P and UV-500Q based on Turnover. May also close HV-47. HV-41 and HV-43 are already closed.</p>
	BOP	<p style="text-align: center;">CAUTION</p> <p>If the Blowdown Heat Exchanger is not allowed to cool down prior to isolation of the cooling water flow, isolating cooling water flow to the Blowdown Heat Exchanger may result in severe water hammer to the downstream piping.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1 (Rev. 1)** Event No.: **1**

Event Description: **Secure and isolate SG Blowdown from SG #1**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 5.3.5</p> <p>IF cooling water flow is required to be isolated, THEN close ALL of the following:</p> <ol style="list-style-type: none">1. SCN-V199, Blowdown Heat Exchanger SCN-E02 Inlet (Outside at Blowdown Demin Unit).2. SCN-VA59, Blowdown Heat Exchanger Cooling Water Flow Control Valve to Heater Drain Pump A Discharge (110 ft Turbine Building Under Heater Drain Tank A).3. SCN-VA60, Blowdown Heat Exchanger Cooling Water Flow Control Valve to Heater Drain Pump B Discharge (110 ft Turbine Building Under Heater Drain Tank B). <p>Expected Action: N/A. Per Turnover, cooling water will not be isolated.</p>

Examiner Note: When the operator closes UV-500P and UV-500Q, **OR** at the discretion of the Lead Examiner, may proceed to next event.

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **2**

Event Description: **CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, fails LOW in the AUTO Mode**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Alarms are received and acknowledged.</p> <p>The crew is alerted by the following:</p> <ul style="list-style-type: none"> Annunciators: <ul style="list-style-type: none"> 3A08A (CHG HDR SYS TRBL) 3A11B (RCP SEAL INJ FLOW HI-HI OR LO) This is a reverse-acting controller in that the actual DP goes low when the controller fails to 100% output. As the DP in the charging header drops, RCP seal injection flow will lower to less than 6 gpm. <p>Alarm response procedure 40AL-9RK3A is referenced for operator response.</p> <p>Examiner Note: ARP for RCP NCW flow low is on Page 8.</p>

**40AL-9RK3A, 3A08A (CHG HDR SYS TRBL, Point ID
CHPDS240, Regen Hx to Reactor Coolant Loop 2A Diff Press
Hi-Lo)**

	RO	<p>Operator Action 1</p> <p>Check CHN-PDIC-240, Charging Line to RC Loop 2A DP Control.</p> <p>Expected Action: RO observes CHN-PDIC-240 red arrow is reading 0. Diagnoses that CHN-PDIC-240 has failed as indicated by observing pressure on CHN-PDIC-240 on Board B03. (NOTE: Back pressure fails LOW and controller output fails HIGH)</p>
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Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 2		
Event Description: CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, fails LOW in the AUTO Mode		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Actions 2 and 2.1</p> <p>IF CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, indicates greater than or equal to 170 psid, THEN perform the following:...</p> <p>Expected Action: N/A. Reading on CHN-PDIC-240 is 0.</p>
	RO	<p>Operator Actions 3 and 3.1</p> <p>IF CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, indicates less than or equal to 90 psid, THEN perform the following:</p> <p>Check CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, setpoint is between 90 psid and 135 psid.</p> <p>Expected Action: Operator observes Red arrow on CHN-PDIC-240 indicate 0 psid.</p>
Examiner NOTE: If CRS elects not to take manual control of CHN-PDIC-240, the Lead Examiner cues the SM to direct the crew to take manual control and restore differential pressure to the normal band. (refer to 40DP-9OP02, Section 14.0, Manual Override of Automatic Systems)		

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **2**

Event Description: **CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, fails LOW in the AUTO Mode**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action 3.2</p> <p>IF CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, setpoint is NOT between 90 psid and 135 psid, THEN adjust CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, setpoint between 90 psid and 135 psid.</p> <p>Expected Action: RO adjust thumbwheel (if necessary) on CHN-PDIC-240 until black and white arrow indicates between 90 and 135 psid.</p> <p>Examiner Note: The alarms 3A08A (CHG HDR SYS TRBL) and 3A11B (RCP SEAL INJ FLOW HI-HI OR LO) will clear when pressure on CHN-PDIC-240 is adjusted to 90-135 psid.</p>
	RO	<p>Operator Action 3.3</p> <p>IF the SM/CRS determines us of Auxiliary Spray is required, THEN place CHN-HS-239, CHARGING LINE TO RC LOOP 2A VLV, to CLOSE.</p> <p>Expected Action: N/A. Auxiliary Spray is NOT required.</p>
	RO	<p>Operator Action 3.4</p> <p>Check ALL of the following to determine the cause of the alarm:</p> <ul style="list-style-type: none">• Improper valve alignment• Automatic valve malfunction• Piping leaks <p>Expected Action: Operator checks instruments and determines that CHN-PDIC-240 has failed LOW in automatic.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 2		
Event Description: CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, fails LOW in the AUTO Mode		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action 3.5</p> <p>IF the cause for high differential pressure is NOT corrected, THEN initiate a PVAR to correct the condition.</p> <p>Expected Action: Operator acknowledges the need for a PVAR.</p>
	RO	<p>Operator Action 3.6</p> <p>IF BOTH of the following conditions exist:</p> <ul style="list-style-type: none"> CHE-HV-239, Charging Header to RCS Backpressure Control Valve, is closed to provide Auxiliary Spray The SM/CRS determines Auxiliary Spray is NOT required <p>THEN place CHN-HS-239, CHARGING LINE TO RC LOOP 2A VLV, to OPEN.</p> <p>Expected Action: N/A. Conditions do NOT exist.</p>
40AL-9RK3A, window 3A11B, GROUP B, Seal Injection to RCPs Flow Lo.		
	RO	<p>First Priority Operator Action 1</p> <p>Determine which of the four seal injection legs has the Lo flow, by reading the alarm CRT.</p> <p>Expected Action: RO observes low flow on the following indicators:</p> <ul style="list-style-type: none"> CHN-FIC-241, CHN-FIC-242, CHN-FIC-243, CHN-FIC-244

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 2		
Event Description: CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, fails LOW in the AUTO Mode		
Time	Position	Applicant's Actions or Behavior
	RO	<p>First Priority Operator Action 2</p> <p>IF all seal injection flow is lost to an RCP and the affected RCP is in standby, THEN Isolate bleedoff prior to exceeding 250°F Seal 2 Outlet Temperature.</p> <p>Expected Action: N/A. No RCPs are in standby.</p>
	RO	<p>Second Priority Operator Action 1</p> <p>Take manual control of the affected RCP's flow indicator controller(s) and adjust seal injection flow to the normal value of 6.0 to 7.5 gpm. (6.6 gpm nominal)</p> <p>Expected Action: RO may take manual control of the following, although it would be ineffective since seal injection flow is at maximum:</p> <ul style="list-style-type: none"> • CHN-FIC-241 • CHN-FIC-242 • CHN-FIC-243 • CHN-FIC-244
	RO	<p>Second Priority Operator Action 2</p> <p>IF the CRS/Shift Manager directs, THEN increase the pressure in the charging header by using the regenerative heat exchanger to charging line differential pressure indicator controller CHN-PDIC-240 on B03. Adjust to achieve 2430 to 2500 psig as read at the charging pumps to regenerative heat exchanger pressure indicator CHA-PI-212 on B03.</p> <p>Expected Action: RO depresses MAN button on CHN-PDIC-240. Moves slider to the left to lower controller output until CHA-PI-212 reads between 2430 and 2500 psig.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 2		
Event Description: CHN-PDIC-240, Charging Line to RC Loop 2A DP Control, fails LOW in the AUTO Mode		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Second Priority Operator Action 3</p> <p>Direct a Nuclear Operator to check the seal injection filters differential pressure on local indicator CHN-PDIS-241.</p> <p>Expected Action: RO directs an AO to report seal injection filters DP.</p> <p>AO Report: CHN-PDIS-241 reads 4 psid.</p>
	RO	<p>Second Priority Operator Action 4</p> <p>IF the CRS/SM directs, THEN place a new filter in service.</p> <p>Expected Action: N/A. 4 psig is a normal reading.</p>
	RO	<p>Second Priority Operator Action 5</p> <p>Refer to 40AO-9ZZ04, Reactor Coolant Pump Emergencies, for further information.</p> <p>Expected Action: RO prompts CRS to refer to 40AO-9ZZ04.</p>
<p>Examiner Note: Once manual control is taken and pressure is restored to between 90 and 135 psig (as read on CHN-PDIC-240), OR at the discretion of the Lead Examiner, may proceed to the next event.</p>		

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 3		
Event Description: Auxiliary Transformer High Temperature.		
Time	Position	Applicant's Actions or Behavior
	CREW	<p>Receives and acknowledges alarm.</p> <p>The crew is alerted by the following:</p> <ul style="list-style-type: none"> • Annunciator 1B01A (UNIT AUX XFMR X02 PROT TRIP/TRBL) • Computer Point ID MAYS57, AUX XFMR STATUS (on computer), Unit Aux Xfmr MAN-X02 Trouble (in ARP). <p>Alarm response procedure 40AL-9RK1B is referenced for alarm response.</p>
40AL-9RK1B, 1B01A, Point ID MAYS57 (Unit Aux Xfmr MAN-X02 Trouble)		
	RO	<p>Operator Action 1</p> <p>IF ANY of the following conditions exist:</p> <ul style="list-style-type: none"> • NAN-S01 is de-energized • NAN-S02 is de-energized <p>THEN REFER TO 40AO-9ZZ12, Degraded Electrical Power.</p> <p>Expected Action: N/A. Both NAN-S01 & NAN-S02 remain energized.</p>
<p>Examiner Note: If the crew looks at Unit Aux Transformer Temperatures on ERFDADS, they will not be trending up. If called as OCS, the driver will report it appears to be a problem with those points on ERFDADS</p>		

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **3**

Event Description: **Auxiliary Transformer High Temperature.**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Actions 2, 2.1, & 2.2</p> <p>Direct an Auxiliary Operator to perform the following:</p> <p>Determine cause of the alarm locally at Unit Aux Xfmr annunciator panel.</p> <p>REFER TO 40AL-9MA01, Transformer Trouble Alarm Responses for actions.</p> <p>Expected Action: RO directs AO to investigate locally.</p> <p>Initial AO Report: Wait 3 minutes and report that winding temperature is 125°C and rising slowly. All fans and oil pumps are operating. If requested, oil temperature is 78°C and rising slowly. AO recommends a reduction in Unit Aux Xfmr load or a transfer to the alternate power source per 40AL-9MA01, Unit Aux Transformer MAN-X02, High Winding Temp, Action 4.</p>
	RO	<p>Operator Action 3</p> <p>IF Unit Auxiliary OR Main transformer fire exists, THEN direct an Auxiliary Operator to stop both isophase bus cooling fans:</p> <ul style="list-style-type: none"> • MCENA01A, Isophase Bus Cool Airblower A (NGN-L15D3). • MCENA01B, Isophase Bus Cool Airblower B (NGN-L14D3). <p>Expected Action: N/A. No fire exists.</p>
	RO	<p>Operator Action 4</p> <p>IF directed by 40AL-9MA01, Transformer Trouble Alarm Responses, to transfer bus NAN-S01 to NAN-S03 AND bus NAN-S02 to NAN-S04, THEN REFER TO 40OP-9NA03, 13.8 KV Electrical System (NA) to transfer the buses.</p> <p>Expected Action: RO refers to 40OP-9NA03. See Page 14 of this scenario.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 3		
Event Description: Auxiliary Transformer High Temperature.		
Time	Position	Applicant's Actions or Behavior
	RO	Operator Action 5 Initiate PVAR. Expected Action: As directed.
	RO	NOTE This alarm will not reflash when a second alarm input is generated until the initial alarm input is cleared.
	RO	Operator Action 6 IF the alarm remains locked in, THEN monitor local Alarm Panel at increased frequency as directed by SM/CRS. Expected Action: CREW may discuss increasing the frequency of monitoring.
	RO	Operator Actions 7, 7.1, & 7.2 WHEN the cause of alarm has been corrected, THEN perform the following: Restore normal 13.8KV bus alignment per 40OP-9NA03, 13.8 KV Electrical System (NA). Restore Isophase Bus Cooling system to normal operation per 40OP-9CE02, Isophase Bus Cooling. Expected Action: N/A. Alarm cause not yet corrected.

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 3		
Event Description: Auxiliary Transformer High Temperature.		
Time	Position	Applicant's Actions or Behavior
40AL-9MA01, UNIT AUX TRANSFORMER MAN-X02, Group H, High Winding Temp.		
	AO	<p>Operator Action 1.</p> <p>Confirm the high winding temperature condition by reading the Winding Temperature indicators mounted next to the control cabinet.</p> <p>Expected Action: N/A. Local action.</p>
	AO	<p>Operator Action 2.</p> <p>Check for a high oil temperature condition by reading the liquid temperature indicator.</p> <p>Expected Action: N/A. Local action.</p>
	AO	<p>Operator Action 3.</p> <p>IF oil temperature is high, THEN perform the response section for High Oil Temp, Group I.</p> <p>Expected Action: N/A. Local action.</p>
	AO	<p>Operator Action 4.</p> <p>Notify Control Room and recommend a reduction in Unit Aux Xfmr load or a transfer to the alternate power source if winding temperature is not being reduced.</p> <p>Expected Action: AO prompts CR to transfer loads on Unit Aux Transformer.</p>
	AO	<p>NOTE</p> <p>If the transformer alarm is locked in, then no further alarms will annunciate in the Control Room.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **3**

Event Description: **Auxiliary Transformer High Temperature.**

Time	Position	Applicant's Actions or Behavior
	AO	<p>Operator Action 5.</p> <p>IF the alarm remains locked in, THEN increase monitoring of the transformer annunciator cabinet as recommended by the CRS/SM.</p> <p>Expected Action: CREW may discuss increasing the frequency of monitoring.</p>

40OP-9NA03, 13.8 KV Electrical System (NA)

	RO	<p>Instruction 7.3.1.</p> <p>Perform the appropriate section of Appendix D - S/U Xfmr Winding Loading Guidance if a related Startup Xfmr winding is supplying more than one unit:</p> <p>Unit 1 only - IF X03Z or X01Y are supplying more than one unit, THEN perform section 6.0 of Appendix D - S/U Xfmr Winding Loading Guidance.</p> <p>Expected Action: N/A. S/U transformer is <i>not</i> supplying more than 1 Unit.</p>
	RO	<p>Instruction 7.3.2.</p> <p>In the Control Room on B01, turn the Synchronizing Switch for NAN-S03-NAN-S01 Tie breaker, NAN-SS-S03B, to ON and check for proper synchronization.</p> <p>Expected Action: As directed.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 3		
Event Description: Auxiliary Transformer High Temperature.		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 7.3.3.</p> <p>Close the NAN-S03-NAN-S01 Tie breaker NAN-S03B by turning handswitch NAN-HS-S03B to CLOSE.</p> <p>Expected Action: As directed.</p> <p>Examiner Note: The following are expected alarms for these actions:</p> <ul style="list-style-type: none"> • 1A04B (120VAC 1E PNL D25 INVERTER A TRBL) • 1A05B (120VAC 1E PNL D27 INVERTER C TRBL) • 1B10A (13.8 4.16 KV BUS XFR NOT-IN AUTO) • 1B18C (GENERATING UNIT 1 OSCG OPERATED/TRBL) (clears immediately) <p>AO is directed to investigate inverter trouble alarms.</p> <p>AO Report: Wait 3 minutes and report that both inverters have a red, "inverter out of sync" light.</p>
	RO	<p>Instruction 7.3.4.</p> <p>Check NAN-S01 Supply breaker, NAN-S01A, automatically opens when handswitch NAN-HS-S03B is released.</p> <p>Expected Action: As directed. RO may call an AO and ask for a report on winding temperature after some loads have been transferred.</p> <p>AO Report: Wait 3 minutes and report that winding temperature is 127°C and still rising, but at a slower rate.</p>
	RO	<p>Instruction 7.3.5.</p> <p>Check NAN-S01 voltage is between 12.42 kV - 14.49 kV.</p> <p>Expected Action: RO checks voltmeter below NAN-HS-S01A.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 3		
Event Description: Auxiliary Transformer High Temperature.		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 7.3.6.</p> <p>Turn the Synchronizing Switch for NAN-S03-NAN-S01 Tie breaker, NAN-SS-S03B, to OFF.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 11.3.1.</p> <p>Perform the appropriate section of Appendix D - S/U Xfmr Winding Loading Guidance if a related Startup Xfmr winding is supplying more than one unit:</p> <p>Unit 1 only - IF X02Y or X01Z are supplying more than one unit, THEN perform section 8.0 of Appendix D - S/U Xfmr Winding Loading Guidance.</p> <p>Expected Action: N/A. S/U transformer is <i>not</i> supplying more than 1 Unit.</p>
	RO	<p>Instruction 11.3.2.</p> <p>In the Control Room on B01, turn the Synchronizing Switch for NAN-S04-NAN-S02 Tie breaker, NAN-SS-S04B, to ON and check for proper synchronization.</p> <p>Expected Action: As directed.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 3		
Event Description: Auxiliary Transformer High Temperature.		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 11.3.3.</p> <p>Close the NAN-S04-NAN-S02 Tie breaker NAN-S04B by turning handswitch NAN-HS-S04B to CLOSE.</p> <p>Expected Action: As directed.</p> <p>Examiner Note: The following are expected alarms for these actions:</p> <ul style="list-style-type: none"> • 1A04D (120VAC 1E PNL D26 INVERTER B TRBL) • 1A05D (120VAC 1E PNL D28 INVERTER D TRBL) • 1B10A (13.8 4.16 KV BUS XFR NOT-IN AUTO) • 1B18C (GENERATING UNIT 1 OSCG OPERATED/TRBL) (clears immediately) <p>AO is directed to investigate inverter trouble alarms.</p> <p>AO Report: Wait 3 minutes and report that both inverters have a red, "inverter out of sync" light.</p>
	RO	<p>Instruction 11.3.4.</p> <p>Check NAN-S02 Supply breaker, NAN-S02A, automatically opens when handswitch NAN-HS-S04B is released.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 11.3.5.</p> <p>Check NAN-S02 voltage is between 12.42 kV - 14.49 kV.</p> <p>Expected Action: RO checks voltmeter below NAN-HS-S02A.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **3**

Event Description: **Auxiliary Transformer High Temperature.**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 11.3.6.</p> <p>Turn the Synchronizing Switch for NAN-S04-NAN-S02 Tie breaker, NAN-SS-S04B, to OFF.</p> <p>Expected Action: As directed.</p> <p>AO Report: Winding temperature is 119°C and slowly lowering.</p>
<p>Examiner Note: Once the AO reports that winding temperature is lowering, OR at the discretion of the Lead Examiner, may proceed to the next event.</p>		

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **4**

Event Description: **'B' Main Feedwater Pump Trips, Reactor Power Cutback**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Alarms are received and acknowledged.</p> <p>Operators are alerted to the trip by the following:</p> <ul style="list-style-type: none">• Annunciator 6A09A (FWPT B TRIP)• Annunciator 4A11B (REAC PWR CUTBACK) <p>Various other alarms on B04 are received and acknowledged. Alarm response procedure 40AL-9RK4A is referenced for operator response.</p> <p>Examiner Note: Based on these annunciators, the CRS may elect to directly enter 40AO-9ZZ09, Reactor Power Cutback (Loss of FeedPump). Board operators may still reference ARPs. Alarm response for 4A11B is provided, beginning on Page 27???.</p> <p>AO Report: If directed to investigate trip of MFP 'B,' wait 3 minutes and report no obvious reason for MFP trip.</p> <p>AO Report: If directed to check status of MFP 'A,' wait 3 minutes and report it is running normally.</p>

40AO-9ZZ09, Reactor Power Cutback (Loss of Feedpump), Section 3.0, Loss of Feedpump.

	CRS	<p>Instruction 1.</p> <p>Enter AOP Entry Time and Date:</p> <p>Expected Action: As directed.</p>
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Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **4**

Event Description: **'B' Main Feedwater Pump Trips, Reactor Power Cutback**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 2</p> <p>IF reactor power was 74% or more, THEN perform the following:</p> <ul style="list-style-type: none"> a. Check that a Reactor Power Cutback Loss of Feedpump (RPCB LFP) has actuated. b. Check that CEA subgroups 4, 5, and 22 have inserted. <p>Expected Action: BOP observes the LOSS OF FEEDPUMP light on SFN-UIC-3, REACTOR POWER CUTBACK CONTROL PANEL. Also observes that rod bottom lights on the Core Mimic Panel are lit for subgroups 4, 5, and 22.</p>
	CRS	<p>Instruction 3</p> <p>IF reactor power was less than 74%, THEN check that CEAs are inserting as needed to match reactor and turbine power.</p> <p>Expected Action: N/A. Reactor power was greater than 74%.</p>
	BOP	<p>Instruction 4</p> <p>Check Main Turbine Setback - Runback has lowered Main Turbine load to 65% or less. (~890 MW)</p> <p>Expected Action: BOP observes MEGAWATTS meter on MTN-A-001, EHC CONTROL PANEL.</p>
	CRS	<p>Instruction 5</p> <p>IF any CEA deviates from its subgroup by greater than 6.6 inches, AND ANY CEA Reg Groups are below the Transient Insertion Limits, THEN perform the following:</p> <ul style="list-style-type: none"> a. Trip the reactor. b. GO TO 40EP-9EO01, Standard Post Trip Actions. <p>Expected Action: N/A. No CEAs are below the Transient Insertion Limits.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 4		
Event Description: 'B' Main Feedwater Pump Trips, Reactor Power Cutback		
Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 6</p> <p>Direct the STA to PERFORM Appendix D, Status Check RPCB Loss of Feedwater Pump.</p> <p>Expected Action: This is normally an STA function. CRS may direct a board operator to perform this check.</p>
	CRS	<p>Instruction 7</p> <p>IF BOTH Feed Pumps trip, THEN perform the following:</p> <ul style="list-style-type: none"> a. Trip the reactor. b. GO TO 40EP-9EO01, Standard Post Trip Actions. <p>Expected Action: N/A. MFP A still running.</p>
	BOP	<p>Instruction 8</p> <p>Raise the Speed Bias on the operating Main Feedwater Pump(s) to zero or more.</p> <p>Expected Action: If necessary, BOP depresses up arrow on SGN-FIC-1107, SG 1 FW TURBINE 'A' SPEED CONTROL.</p>
	BOP	<p>Instruction 9</p> <p>Restore and maintain S/G levels 45 - 60% NR.</p> <p>Expected Action: BOP observes that MFP A is controlling SG levels in automatic.</p>
	CRS	<p style="text-align: center;">CAUTION</p> <p>Manually withdrawing CEAs during a reactor power transient may result in a Variable Over Power Trip (VOPT).</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **4**

Event Description: **'B' Main Feedwater Pump Trips, Reactor Power Cutback**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 10</p> <p>Check that BOTH of the following are being maintained in automatic:</p> <ul style="list-style-type: none"> • RRS is adjusting CEAs to restore Tave/Tref + 3°F • SBCS opens if required to control main steam pressure at setpoint <p>Expected Action: BOP observes that Reg Groups are withdrawing to restore Tavg. Monitors IJ-RCN-TR-100 on B04.</p> <p>Examiner Note: BOP may manipulate the Group Select switch and/or the Individual CEA Selection switch to monitor group 3 CEAs on the digital displays.</p>
	CRS	<p>Instruction 11</p> <p>IF steaming to atmosphere, THEN inform Radiation Protection and the RMS Technician.</p> <p>Expected Action: N/A. Not steaming to atmosphere.</p>
	CRS	<p style="text-align: center;">NOTE</p> <p>Condensate Pumps trip at 30 inches hotwell level.</p>
	CRS	<p>Instruction 12</p> <p>IF condenser hotwell level is less than 41 inches, THEN direct an operator to maintain the condenser hotwell level 41 inches or more using ANY of the following:</p> <ul style="list-style-type: none"> • Hotwell makeup and reject controllers • CDN-HCV-154, "1A" HOTWELL HALF MANUAL MAKE-UP ISOLATION VALVE" • CDN-HCV-155, "2A" HOTWELL HALF MANUAL MAKE-UP ISOLATION VALVE" <p>Expected Action: N/A. Hotwell level is greater than 41 inches.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **4**

Event Description: **'B' Main Feedwater Pump Trips, Reactor Power Cutback**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 13</p> <p>IF reactor power is 70% or less and stable, THEN perform the following:</p> <ul style="list-style-type: none">a. IF the RPCB "AUTO ACTUATE OUT OF SERVICE" pushbutton is NOT lit, THEN press the "AUTO ACTUATE OUT OF SERVICE" pushbutton.b. IF the RPCB "TEST RESET" pushbutton is NOT lit, THEN press the "TEST RESET" pushbutton. <p>Expected Action: As directed.</p>
	CRS	<p style="text-align: center;">NOTE</p> <p>The LOAD LIMIT LIMITING light may be on if a load setback has been initiated and the setback is controlling. If the Load Set motor is controlling, then the light will be out.</p>
	BOP	<p>Instruction 14</p> <p>Perform a lamp test to ensure the "LOAD LIMIT LIMITING" light illuminates.</p> <p>Expected Action: BOP depresses the "LAMP TEST" button on the bottom of the EHC CONTROL PANEL.</p>
	BOP	<p>Instruction 15</p> <p>Reduce the load limit potentiometer until the potentiometer has positive control of the Main Turbine control valves.</p> <p>Expected Action: BOP rotates the LOAD LIMIT SET potentiometer CCW until the LOAD LIMIT LIMITING light illuminates.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **4**

Event Description: **'B' Main Feedwater Pump Trips, Reactor Power Cutback**

Time	Position	Applicant's Actions or Behavior
	CRS	<p style="text-align: center;">NOTE</p> <p>When the CEAs are placed in Manual Sequential, the RCS temperature will begin to slowly drop due to the build up of xenon. If a power reduction is NOT required due to equipment issues or core age, the CRS should move without delay through the procedure to step 31. This is where the Reg Group CEA overlap is restored which will help to restore the RCS temperature.</p>
	BOP	<p>Instruction 16</p> <p>IF a RPCB has dropped CEA subgroups, AND BOTH of the following conditions are met:</p> <ul style="list-style-type: none"> • CEA motion is only required to compensate for Xenon buildup • Main Turbine load limiting light is on <p>THEN place CEDMCS in Manual Sequential "MS".</p> <p>Expected Action: BOP places CEDMCS in Manual Sequential "MS."</p>
	BOP	<p>Instruction 17</p> <p>Monitor CPC Point ID 0187 CPC ASI - Aux Trip.</p> <p>Expected Action: BOP scrolls screens on at least one of the DNBR/LPD CALCULATOR PANELS until Point ID 0187 is displayed.</p>
	CRS	<p style="text-align: center;">NOTE</p> <p>CPC Group Display "LOW POWER MONITORING" can be used to monitor ASI and the summed value of excores, Pt ID 0125, DKSUM.</p> <p style="text-align: center;">NOTE</p> <p>During a power reduction, the CPC Aux Trip on ASI is "armed" when the summed value of the upper, middle and lower excores is greater than 45%.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **4**

Event Description: **'B' Main Feedwater Pump Trips, Reactor Power Cutback**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 18</p> <p>IF ALL of the following conditions are met:</p> <ul style="list-style-type: none">• CPC Pt ID 0187 indicates greater than + 0.45• CPC Pt ID 0187 is trending to + 0.5• CPC Aux Trip on ASI is still possible (above the Rule of 45), using Pt ID 0125) <p>THEN perform the following:</p> <ol style="list-style-type: none">a. Trip the Reactor.b. GO TO 40EP-9EO01, Standard Post Trip Actions. <p>Expected Action: N/A. None of the given conditions exist.</p>
	RO	<p>Instruction 19</p> <p>Start boron equalization of the pressurizer by performing the following:</p> <ol style="list-style-type: none">a. Energize pressurizer backup heaters as necessary.b. Lower the setpoint on RCN-PIC-100, Pressurizer Pressure Controller to 2220 psia. <p>Expected Action: RO energizes all backup heaters. Uses manual thumbwheel on RCN-PIC-100 to lower the setpoint.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **4**

Event Description: **'B' Main Feedwater Pump Trips, Reactor Power Cutback**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>CRS evaluates Technical Specifications.</p> <p>Enters LCO 3.2.4, Condition A for "COLSS calculated core power not within limit."</p> <p>Based on the following:</p> <ul style="list-style-type: none">• Annunciator 5B01C (COLSS CMC ALARM)• Annunciator 5B01D (COLSS PC ALARM)• Step 21.a of 40AO-9ZZ09, Reactor Power Cutback (Loss of Feedpump), Section 3.0
40AL-9RK4A, 4A11B (REAC PWR CUTBACK, LOSS OF FEED PUMP)		
		<p>First Priority Operator Actions 1, 1.1, & 1.2</p> <p>IF reactor power was 74% or more, THEN perform the following:</p> <p>Check that a Reactor Power Cutback Loss of Feedpump (RPCB LFP) has actuated.</p> <p>Check that CEA subgroups 4, 5, and 22 have inserted.</p> <p>Expected Action: BOP observes the LOSS OF FEEDPUMP light on SFN-UIC-3, REACTOR POWER CUTBACK CONTROL PANEL. Also observes that rod bottom lights on the Core Mimic Panel are lit for subgroups 4, 5, and 22.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **4**

Event Description: **'B' Main Feedwater Pump Trips, Reactor Power Cutback**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>First Priority Operator Action 2</p> <p>IF a RPCB LFP failed to actuate, AND the CRS directs, THEN press BOTH of the following pushbuttons to manually drop CEA subgroups 4, 5 and 22:</p> <ul style="list-style-type: none">• "DROP SUB GRPS"• "LOSS OF FEED PUMP" <p>Expected Action: N/A. RPCB LFP actuated as designed.</p>
	CRS	<p>First Priority Operator Action 3.</p> <p>IF manual actuation of RPCB LFP failed, THEN perform the following:</p> <ol style="list-style-type: none">a. Trip the reactor.b. GO TO 40EP-9EO01, Standard Post Trip Actions. <p>Expected Action: N/A. RPCB LFP actuated as designed.</p>
	CRS	<p>First Priority Operator Action 4.</p> <p>IF reactor power was less than 74%, AND greater than the AML setpoint, THEN ensure CEAs are inserting to match reactor and turbine power.</p> <p>Expected Action: N/A. Reactor power was greater than 74%.</p>
	BOP	<p>First Priority Operator Action 5.</p> <p>GO TO 40AO-9ZZ09, Reactor Power Cutback (Loss of FeedPump).</p> <p>Expected Action: BOP prompts CRS to implement 40AO-9ZZ09.</p>

Examiner Note: After the RO has started boron equalization, **OR** as deemed appropriate by the Lead Examiner, may proceed to the next event.

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **5**

Event Description: **Inadvertent AFAS-1 Train B (AFB 86 Lockout)**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Alarms are received and acknowledged. The crew is alerted by the following:</p> <ul style="list-style-type: none"> • Annunciator 5B07B (LEG 1-3 AFAS-1 B LEG 2-4) • Annunciator 2B06A (AFAS-1) <p>Alarm response procedure 40AL-9RK5B is referenced for operator response.</p> <p>Examiner Note: Based on indications, the CRS may elect to directly enter 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations. Board operators may still reference ARPs. Alarm response for 5B07B is provided, beginning on Page 31.</p>

40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations, Section 3.0, AFAS

	CRS	<p>Instruction 1</p> <p>Enter AOP Entry Time and Date:</p> <p>Expected Action: As directed.</p>
	CRS	<p style="text-align: center;">NOTE</p> <p>Overriding equipment disables automatic operation of the equipment on a valid PPS-ESFAS actuation. Depending on plant conditions, this action may make the equipment inoperable.</p>
	BOP	<p>Instruction 2</p> <p>Override and operate Auxiliary Feedwater Valves as needed to control steam generator level.</p> <p>Expected Action: BOP overrides and closes the following valves:</p> <ul style="list-style-type: none"> • UV-30, AUX FW to SG 1 UPSTREAM VLV, using AFB-HS-30A • UV-34, AUX FW to SG 1 DOWNSTREAM VLV, using AFB-HS-34A

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **5**

Event Description: **Inadvertent AFAS-1 Train B (AFB 86 Lockout)**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>2 minutes after UV-30 & UV-34 are closed, AFB trips on an 86 Lockout. Operators are alerted by the following:</p> <ul style="list-style-type: none"> • Annunciator 6A14D (AFW PMP B DSCH PRESS LO) • White and blue alarms, AFW PMP B P01, on ESB-UA-2B, SAFETY EQPT STATUS TRAIN B SYSTEMS <p>Expected Action: Alarm response procedures 40AL-9RK6A and 40AL-9ES2B are referenced for operator response. Since running AFW is not required for current plant conditions, the crew will likely limit actions to directing an AO to investigate and informing the SM.</p> <p>AO Report: 3 minutes after being directed to investigate, AO reports an acrid smell around breaker cubicle at PBB-S04 and an 86 lockout relay flag is showing.</p>
	CRS	<p>Instruction 3</p> <p>IF AFA-P01 is running, THEN perform the following:</p> <p>Inform Radiation Protection and the RMS Technician of steaming to atmosphere.</p> <p>IF AFA-P01 speed is less than 1000 rpm for greater than five minutes, THEN trip AFA-P01.</p> <p>Expected Action: N/A. AFA is out of service.</p>
	BOP	<p>Instruction 4</p> <p>IF SG Blowdown is isolated, THEN perform the following:</p> <ol style="list-style-type: none"> a. Inform Chemistry that Blowdown is isolated. b. IF COLSS is operable, THEN PERFORM 40OP-9SG03, Operating the Steam Generator Blowdown System, to insert zero for BOTH of the following constants in the CMC and PC: <ul style="list-style-type: none"> • NKBMF1 • NKBMF2 <p>Expected Action: Crew discusses resetting blowdown constants. CRS may defer this action. If not, BOP inserts zero in CMC and PC.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **5**

Event Description: **Inadvertent AFAS-1 Train B (AFB 86 Lockout)**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Based on the AFAS failure, the CRS may evaluate LCOs 3.3.5, Engineered Safety Features Actuation System (ESFAS) Instrumentation, and 3.3.6, Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip. Without assistance from the SM and I&C, the CRS will not initially be able to determine which LCO applies. Discussion with the SM is sufficient.</p> <p>Based on the failure of AFB, the CRS enters LCO 3.7.5, Auxiliary Feedwater (AFW) System, Condition C, for "Two AFW trains inoperable in MODE 1, 2, or 3."</p> <p>Maintenance Report: If asked for time to repair AFB, report that it will take 4-5 hours</p>

40AL-9RK5B, 5B7B (LEG 1-3 AFAS-1 B LEG 2-4)

	CRS	<p>First Priority Operator Actions 1, 1.1, & 1.2</p> <p>IF the AFAS is valid, THEN perform the following:</p> <p>Ensure that the reactor is tripped.</p> <p>GO TO 40EP-9EO01, Standard Post Trip Actions.</p> <p>Expected Action: N/A. AFAS is <i>not</i> valid.</p>
	BOP	<p>First Priority Operator Action 2</p> <p>IF the AFAS is NOT valid, THEN GO TO 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations.</p> <p>Expected Action: BOP prompts CRS to implement 40AO-9ZZ17.</p>

Examiner Note: After the CRS has determined the T.S. applicability, **OR** as deemed appropriate by the Lead Examiner, may proceed to the next event.

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **6 & 7**

Event Description: **Loss of Condenser Vacuum (Trip Initiator) & RCN-PIC-100, Pressurizer Master Controller Failure**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Alarms are received and acknowledged. Operators are alerted by the following:</p> <p>Annunciators</p> <ul style="list-style-type: none"> • 7B04A (COND SHELL VAC LO) • 7A01A (AIR REM SYS TRBL) • 6A16D (COND VAC LO) <p>Alarm response procedure 40AL-9RK6A and 40AL-9RK7B may be referenced for operator response.</p> <p>Examiner Note: The severity of loss of vacuum does not allow the crew to take substantive actions from the ARPs or AOPs. The CRS/BOP will likely direct an AO to check the expansion joints and vacuum breakers. By the time an AO would normally report back, the Crew will likely be discussing inserting a manual Reactor trip. See Page 38??? for Standard Post Trip Actions.</p>
40AO-9ZZ07, Loss of Condenser Vacuum		
	CRS	<p>Evaluates Diagnostic flowchart. Expected flowpath is Main Gen Sync'd to grid? → YES → Cond press >7" HgA & rising? → NO → Mn Turb load > 410 MW? → YES → GO TO Section 4.0, Event Strategy/Power Reduction</p>
	CRS	<p>Instruction 1</p> <p>Enter AOP Entry Time and Date:</p> <p>Expected Action: As directed.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 6 & 7

Event Description: **Loss of Condenser Vacuum (Trip Initiator) & RCN-PIC-100, Pressurizer Master Controller Failure**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 2</p> <p>Check for ANY of the following possible causes of the loss of vacuum:</p> <ul style="list-style-type: none">• Loss of Cooling Tower Fans• Circ Water Pump trip <p>Expected Action: On B07, BOP observes that all lights are red on the COOLING TOWER FAN CONTROL panel and also observes that all 4 Circ Water Pumps are running.</p>
	CRS	<p>NOTE</p> <p>All Unit 1 condenser expansion joints are normally kept dry.</p> <p>NOTE</p> <p>Unit 2 condenser A and B expansion joints are normally kept dry.</p> <p>NOTE</p> <p>Unit 3 condenser C expansion joint is normally kept dry</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 6 & 7

Event Description: **Loss of Condenser Vacuum (Trip Initiator) & RCN-PIC-100, Pressurizer Master Controller Failure**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 3</p> <p>Direct an operator to perform the following:</p> <ol style="list-style-type: none">Ensure water seal on ALL of the following: (REFER TO 40OP-9AR01, Condenser Air Removal, for Condenser Expansion Joints or Vacuum Breakers and 40OP-9GS01, Turbine Steam Seal and Drain (GS), for Gland Exhaust Packing Exhauster.)<ul style="list-style-type: none">Unit 2: Condenser C Expansion JointUnit 3: Condenser A and B Expansion JointsVacuum BreakersSteam Packing Exhauster Condenser drainCheck for ANY of the following possible causes of the loss of vacuum:<ul style="list-style-type: none">Air in leakage at Condenser Expansion JointsAir in leakage at Condenser ShellsImproper operation of the Air Removal PumpsImproper operation of the Gland Seal RegulatorsCondensate Demin valve misalignment to TDS sumpClogged Circ Water Pump intake screens <p>Expected Action: BOP directs an AO to check these items.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 6 & 7

Event Description: **Loss of Condenser Vacuum (Trip Initiator) & RCN-PIC-100, Pressurizer Master Controller Failure**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 3 (continued)</p> <p>c. Unit 1 only:</p> <p>IF leakage is suspected at any Condenser Expansion Joint(s), THEN establish water seal on affected expansion joint(s) using ANY of the following:</p> <ul style="list-style-type: none"> • CDN-V207, A Condenser Expansion Joint Seal Water Supply Isol Valve • CDN-V208, B Condenser Expansion Joint Seal Water Supply Isol Valve • CDN-V081, C Condenser Expansion Joint Seal Water Supply Isol Valve <p>Expected Action: BOP directs an AO to establish a water seal as necessary.</p>
	BOP	<p>Instruction 4</p> <p>Ensure that all available Air Removal Pumps are in operation.</p> <p>Expected Action: BOP observes that all 4 Condenser Air Removal Pumps are running and that UV-14, UV-15, and UV-16 are open.</p>
	CRS	<p style="text-align: center;">NOTE</p> <p>The suction valves for the "D" Air Removal Pump may be opened even if the "D" pump is not running.</p>
	BOP	<p>Instruction 5</p> <p>IF vacuum is degrading in one condenser shell, THEN place ALL of the Air Removal Pump D Condenser Suction Valves, in the "OPEN" position:</p> <ul style="list-style-type: none"> • ARN-UV-14 (Condenser A) • ARN-UV-15 (Condenser B) • ARN-UV-16 (Condenser C) <p>Expected Action: BOP observes that all 3 valves are already open.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 6 & 7

Event Description: **Loss of Condenser Vacuum (Trip Initiator) & RCN-PIC-100, Pressurizer Master Controller Failure**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 6</p> <p>IF the Condenser vacuum continues to degrade, THEN REFER TO ANY of the following to determine if further action is required: [Ref: 5.5]</p> <ul style="list-style-type: none">• Section 3.0, Diagnostic• Appendix F, Reactor Trip Criteria <p>Expected Action: CRS directs the crew to initiate a Reactor trip. CRS implements 40EP-9EO01, Standard Post Trip Actions</p>

40EP-9EO01, Standard Post Trip Actions

	CRS	<p>Instruction 1</p> <p>Open the Placekeeper and enter the EOP Entry Time.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 2</p> <p>Determine that Reactivity Control acceptance criteria are met by the following:</p> <ul style="list-style-type: none">a. Check that reactor power is droppingb. Check that start-up rate is negativec. Check that ALL full strength CEAs are inserted <p>Expected Action: As directed.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 6 & 7

Event Description: **Loss of Condenser Vacuum (Trip Initiator) & RCN-PIC-100, Pressurizer Master Controller Failure**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Instruction 3</p> <p>Determine that Maintenance of Vital Auxiliaries acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that the Main Turbine is tripped Check that the Main Generator output breakers are open Check that station loads have transferred to offsite electrical power such that BOTH of the following conditions are met: <ul style="list-style-type: none"> All vital and non-vital AC buses are powered All vital and non vital DC buses are powered <p>Expected Action: RO reports all vital and non-vital AC & DC buses are powered from off-site. RO also reports that DGs are running, with spray pond support. BOP reports Main Turbine has tripped and Main Generator output breakers are open.</p>
	CRS	<p>Instruction 4</p> <p>Determine that RCS Inventory Control acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that pressurizer level meets BOTH of the following: <ul style="list-style-type: none"> 10-65% Trending as expected to 33-53% Check that the RCS is 24°F or more subcooled Check that BOTH of the following are in service to all RCPs <ul style="list-style-type: none"> Seal injection Nuclear Cooling Water <p>Expected Action: RO observes PZR level is trending to 33-53% and subcooling is greater than 24°F. Reports that 2 charging pumps are running, letdown is in service, and components are in AUTO. RO observes seal injection and NCW is in service to all RCPs.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 6 & 7

Event Description: **Loss of Condenser Vacuum (Trip Initiator) & RCN-PIC-100, Pressurizer Master Controller Failure**

Time	Position	Applicant's Actions or Behavior
	CRS/RO EVENT 8	<p>Instruction 5</p> <p>Determine that RCS Pressure Control acceptance criteria are met by BOTH of the following:</p> <ul style="list-style-type: none"> • Pressurizer pressure is 1837-2285 psia • Pressurizer pressure is trending as expected to 2225-2275 psia <p>Expected Action: RO observes that Pressurizer pressure is <i>not</i> trending to 2225-2275 psia.</p>
	RO EVENT 8	<p>Contingency Action 5.1</p> <p>Restore and maintain pressurizer pressure to the normal control band by ANY of the following:</p> <ul style="list-style-type: none"> • Operation of PPCS • Manual operation of pressurizer heaters and spray valves <p>Expected Action: RO takes manual control of RCN-PIC-100, Pressurizer Master Control by depressing the MAN button and moving the slider to the left to lower the controller output and close the main spray valves. (Optional: Operator may also take manual control of RCN-PIK-100 to restore pressure.)</p>
CRITICAL TASK – Close the Pressurizer Spray Valves before a SIAS occurs at 1837 psig.		SAT / UNSAT

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 6 & 7

Event Description: **Loss of Condenser Vacuum (Trip Initiator) & RCN-PIC-100, Pressurizer Master Controller Failure**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 6</p> <p>Determine that Core Heat Removal acceptance criteria are met by ALL of the following:</p> <ul style="list-style-type: none"> • At least one RCP is operating • Loop ΔT is less than 10°F • RCS is 24°F or more subcooled <p>Expected Action: RO reports that all RCPs are operating, ΔT is less than 10°F, and that subcooling is greater than 24°F.</p>
	CRS/BOP	<p>Instruction 7</p> <p>Determine that RCS Heat Removal acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> a. Check that at least one Steam Generator meets BOTH of the following conditions: <ul style="list-style-type: none"> • Level is 35% WR or more • Feedwater is restoring or maintaining level 45-60% NR b. Check that T_c is 560-570°F c. Check that steam generator pressure is 1140-1200 psia <p>Expected Action: BOP reports that both SGs WR level is greater than 35%, AFN is restoring levels to 45-60% NR, and that the SBCS is controlling in AUTO, T_c is 560-570°F and SG pressures are 1140-1200 psia.</p> <p>Approximately 5 minutes after the trip, vacuum will degrade enough to cause the 'A' MFP to trip. The BOP will have to start AFN-P01 by opening both suction valves using CTA-HS-1 and CTA-HS-4. After these valves are open AFN-P01 can be started using AFN-HS-11. The BOP operator can then use either the Downcomer flow control valves or the Downcomer bypass valves to feed the SGs.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 6 & 7

Event Description: **Loss of Condenser Vacuum (Trip Initiator) & RCN-PIC-100, Pressurizer Master Controller Failure**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Instruction 8</p> <p>Determine that Containment Isolation acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that Containment pressure is <2.5 psig REFER TO Appendix 7, List of EOP Radiation Monitors and check BOTH of the following conditions: <ul style="list-style-type: none"> No valid containment area radiation monitor alarms or unexplained rise in activity No valid steam plant activity monitor alarms or unexplained rise in activity <p>Expected Action: RO/BOP observes that Containment pressure is less than 2.5 psig. BOP reports no unexplained rise in activity on containment or steam plant monitors.</p>
	RO	<p>Instruction 9</p> <p>Determine that Containment Temperature, Pressure, and Combustible Gas Control acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that containment temperature is <117°F Check that containment pressure is <2.5 psig <p>Expected Action: RO reports that Containment temperature is less than 117 °F and that Containment pressure is less than 2.5 psig.</p>
	CRS	<p>Instruction 10</p> <p>IF all acceptance criteria are met, AND no contingency actions were performed, THEN GO TO 40EP-9EO02, Reactor Trip.</p> <p>Expected Action: CRS determines that some contingency actions were taken.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 6 & 7

Event Description: **Loss of Condenser Vacuum (Trip Initiator) & RCN-PIC-100, Pressurizer Master Controller Failure**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 11</p> <p>IF any acceptance criteria are NOT met, OR ANY contingency action was taken, THEN GO TO Section 4.0, Diagnostic Actions to diagnose the event.</p> <p>Expected Action: CRS determines that that there is a Reactor trip in progress and then transitions to 40EP-9EO02, Reactor Trip.</p>
Examiner Note: After BOP reports status of Containment and secondary radiation monitors, OR as deemed appropriate by the Lead Examiner, may proceed to the next event.		

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Alarms are received and acknowledged. Operators are alerted by the following:</p> <p>Annunciators</p> <ul style="list-style-type: none"> • 6A07C, NON-SAFETY AFW PUMP OVLD/TRIP • 6A07D, NON-SAFETY AFW PMP DSCH PRESS LO <p>Alarm response procedure 40AL-9RK6A is referenced for operator response.</p>

40AL-9RK6A, 6A07C (NON-SAFETY AFW PUMP OVLD/TRIP)

	BOP	<p>NOTE</p> <p>The Non-Safety Aux Feedwater pump will trip at 240 amps.</p>
	BOP	<p>First Priority Operator Action 1</p> <p>IF an emergency situation exists, AND the following conditions are satisfied per 40DP-0OP02 (RELAY RESETTING)</p> <ul style="list-style-type: none"> • PBA-S03 is being supplied by the Diesel Generator • Continued operation of AFN-P01 is required. • The Control Room Supervisor/Shift Manager has authorized the 786 Lockout Relay to be reset from the Control Room. <p>THEN attempt a restart of AFN-P01 by placing switch AFN-HS-11 in the STOP position to reset the 786 Lockout Relay and then go to START.</p> <p>Expected Action: If CRS authorizes, BOP takes AFN-HS-11 to STOP, then START.</p> <p>AO Report: If directed to investigate trip of AFN, wait 3 minutes and report that the 86 lockout relay has actuated.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>First Priority Operator Action 2</p> <p>IF the pump fails to start or trips again on overload, THEN maintain Steam Generator level by using AFA-P01 or AFB-P01 Aux Feedwater Pump in accordance with 40OP-9AF01.</p>

40EP-9EO06, Loss of All Feedwater

	CRS	<p>Determines that there is a Loss of All Feedwater in progress and MAY use Section 4.0, Diagnostic Actions to diagnose. CRS ENTERS 40EP-9EO06, Loss of All Feedwater.</p> <p>Examiner Note: Based on existing conditions, the CRS may elect to directly enter 40EP-9EO09, Functional Recovery, if he/she recognizes that the only option for restoring feedwater is to depressurize an SG and establish feedwater from the Condensate Pumps. In this case, see Page 47.</p>
		<p>Instruction 1</p> <p>Confirm the diagnosis of a Loss of All Feedwater by performing the following:</p> <ol style="list-style-type: none"> Check that the Safety Function Status Check acceptance criteria are satisfied. Direct Chemistry to PERFORM 74DP-9ZZ05, Abnormal Occurrence Checklist. <p>Expected Action: CRS prompts STA to perform the Safety Function Status Check. Chemistry is notified.</p>
		<p>Instruction 2</p> <p>Ensure the event is being classified.</p> <p>Expected Action: CRS prompts SM to classify the event.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 8		
Event Description: 86 Lockout of AFN-P01, Loss of All Feedwater		
Time	Position	Applicant's Actions or Behavior
		Instruction 3 Open the Placekeeper and enter the EOP Entry Time. Expected Action: As directed.
		Instruction 4 Stop all RCPs. Expected Action: RO trips all 4 RCPs.
		Instruction 5 Conserve Steam Generator inventory by performing the following: <ol style="list-style-type: none"> Close the Blowdown Containment Isolation Valves. Close the Steam Generator Sample Valves. Expected Action: BOP closes the following valves on B07: <ul style="list-style-type: none"> UV-500P, SG 1 COMM DNSTR ISOL VLV (SGA-HS-500P) UV-500Q, SG 1 COMM DNSTR ISOL VLV (SGB-HS-500Q) UV-500R, SG 2 COMM DNSTR ISOL VLV (SGB-HS-500R) UV-500S, SG 2 COMM DNSTR ISOL VLV (SGA-HS-500P) BOP closes the 12 sample valves on B07 (SG SAMPLE ISOL area).

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
		<p>Instruction 6</p> <p>Restore feed to at least one Steam Generator using ANY of the following:</p> <p>AUXILARY FEEDWATER</p> <ul style="list-style-type: none"> • Appendix 38, Resetting AFA-P01 • Appendix 39, Local Operation of AFB-P01 • Appendix 40, Local Operation of AFA-P01 Using Main Steam • Appendix 41, Local Operation of AFN-P01 • Appendix 42, Aligning Aux Feedwater Pumps Suction to RMWT <p>MAIN FEEDWATER</p> <ul style="list-style-type: none"> • Appendix 43, Restarting MFPs <p>Expected Action: N/A. None of these appendices will work since all 3 AFW pumps are OOS or have failed and MFPs A & B have tripped on low vacuum.</p>
		<p>Contingency Action 6.1</p> <p>IF Auxiliary or Main Feedwater can NOT be restored, THEN GO TO 40EP-9EO09, Functional Recovery to perform ANY of the following:</p> <ul style="list-style-type: none"> • Cross tie electrical buses to restore an Auxiliary Feedwater Pump • Align a Condensate Pump to feed the Steam Generator(s) <p>Expected Action: CRS transitions to 40EP-9EO09.</p>

40EP-9EO09, Functional Recovery Procedure

		<p>NOTE</p> <p>Harsh conditions are containment temperature >170°F or containment radiation level greater than 10⁸ mR/hr. Harsh containment values are placed in brackets next to the normal setpoint or band.</p> <p>(Harsh conditions will not exist for this scenario)</p>
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Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
		<p>Instruction 1</p> <p>Ensure the event is being classified.</p> <p>Expected Action: CRS prompts SM to classify the event.</p>
	CRS	<p>Instruction 2</p> <p>Enter the EOP Entry Time.</p> <p>Expected Action: As directed.</p>
		<p>Instruction 3</p> <p>IF pressurizer pressure remains below the SIAS setpoint, THEN perform the following:</p> <ul style="list-style-type: none"> a. Ensure ONE RCP is stopped in each loop. b. IF RCS subcooling is less than 24°F [44°F], THEN ensure all RCPs are stopped. <p>Expected Action: N/A. RCPs already secured.</p>
	CRS	<p>Instruction 4</p> <p>IF any RCPs are operating, THEN PERFORM Appendix 16, RCP Trip Criteria and check the RCP operating limits satisfied.</p> <p>Expected Action: N/A. RCPs already secured.</p>
	CRS	<p>Instruction 5</p> <p>Perform the following:</p> <ul style="list-style-type: none"> a. Ensure that the Steam Generator Sample Valves are open. b. Direct Chemistry to PERFORM 74DP-9ZZ05, Abnormal Occurrence Checklist. <p>Expected Action: BOP overrides and opens Steam Generator Sample Valves (located at B07, two-handed operation may be utilized) (SG SAMPLE ISOL area). Chemistry informed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 6</p> <p>Place the Hydrogen Analyzers in service.</p> <p>Expected Action: RO places Hydrogen Analyzers in service At B02:</p> <p>Opens isolation valves using:</p> <ul style="list-style-type: none">• HPA-HS-1, HPA-HS-7 (Train A)• HPB-HS-2, HPB-HS-8 (Train B) <p>Places the following to ANALYZE:</p> <ul style="list-style-type: none">• HPA-HS-9A• HPB-HS-10A
	CRS	<p>Instruction 7</p> <p>Identify the success path(s) to be used to satisfy each safety function. REFER TO BOTH of the following:</p> <ul style="list-style-type: none">• Section 4.0, Safety Function Tracking• Section 6.0, Resource Assessment Trees <p>Expected Action: CRS determines Success Path for this scenario is HR-1; SG with no SI.</p> <p>Examiner Note: Step 7 and Step 8 are annotated with an asterisk (*) meaning these steps may be brought forward and performed at any time</p>
	CRS	<p>Instruction 8</p> <p>PERFORM Section 5.0, Safety Function Status Check for those success paths in use.</p> <p>Expected Action: CRS directs STA to perform Safety Function Status Check for HR-1; SG with no SI.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 9</p> <p>Perform ALL of the following in the order listed:</p> <ul style="list-style-type: none">• Success path instructions for those safety functions that are in jeopardy• Success path instructions for those safety functions that are challenged• Success path instructions for all other non-shaded success paths in use <p>Expected Action: CRS transitions to HR-1; SG with no SI.</p>

Success Path: HR-1; SG with no SI

	CRS	<p>Instruction 1</p> <p>Open the placekeeper.</p> <p>Expected Action: As directed.</p>
	CRS	<p>Instruction 2</p> <p>IF ALL of the following conditions exist:</p> <ul style="list-style-type: none">• A Security Delta-10 has been declared• A blackout has occurred• A loss of PKA-M41 <p>THEN direct the operator at AFA-P01 to perform Appendix 112, Manual Operation of AFA-P01 During a Security Event.</p> <p>Expected Action: N/A. A Security Event is <i>not</i> in progress.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 8		
Event Description: 86 Lockout of AFN-P01, Loss of All Feedwater		
Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 3</p> <p>IF ALL of the following conditions exist:</p> <ul style="list-style-type: none"> • A Blackout has occurred • At least one vital 4.16 kV bus has NOT been restored • Subcooling is less than 50°F [50°F] <p>THEN perform the following:...</p> <p>Expected Action: N/A. A Blackout has <i>not</i> occurred.</p>
	CREW	<p>Instruction 4</p> <p>IF at least one vital 4.16 kV bus is energized, THEN perform the following:</p> <ol style="list-style-type: none"> a. PERFORM Appendix 5, RCS and PZR Cooldown Log. b. Cooldown to SDC entry conditions using the SBCS. c. Ensure all RCS inventory makeup is from a borated source throughout the cooldown. <p>Expected Action: BOP initiates Appendix 5. Instruction 4.b is N/A because of loss of vacuum. RO prepares to borate.</p>
	BOP	<p>Contingency Action 4.b.1</p> <p>IF SBCS to the condenser is NOT available, THEN cooldown using ANY of the following:</p> <ul style="list-style-type: none"> • ADV operation from the Control Room • Appendix 116, Operation of SBCS Valves 1007 and 1008 • Appendix 18, Local ADV Operation <p>Expected Action: BOP uses ADVs by manipulating the manual thumbwheel to control the cooldown</p>
	CRS	<p>Instruction 5</p> <p>IF steaming to atmosphere, THEN inform Radiation Protection and the RMS Technician.</p> <p>Expected Action: As directed.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 8		
Event Description: 86 Lockout of AFN-P01, Loss of All Feedwater		
Time	Position	Applicant's Actions or Behavior
	CREW	<p>Instruction 6</p> <p>IF RCPs are NOT operating, THEN check natural circulation flow in at least one loop by ALL of the following:</p> <ul style="list-style-type: none"> • Loop ΔT is less than 65°F [65°F] • Hot and cold leg temperatures are constant or lowering • RCS is 24°F [44°F] or more subcooled using CET Subcooling • Less than a 30°F [30°F] ΔT between Th RTDs and the maximum quadrant CET temperature (QSPDS, pages 211 and 213) <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 7</p> <p>IF a MSIS or SIAS has NOT actuated, AND a controlled cooldown is in progress, THEN lower or bypass the automatic initiation setpoint(s) as the cooldown and depressurization proceed for ANY of the following:</p> <ul style="list-style-type: none"> • MSIS • SIAS <p>Expected Action: BOP periodically lowers the setpoints by depressing all 4 of the following pushbuttons:</p> <ul style="list-style-type: none"> • LO PZR PRESS SETPOINT RESET • LO SG PRESS SETPOINT RESET
	BOP	<p>Instruction 8</p> <p>IF CW flow to the Main Condenser is lost, THEN actuate MSIS.</p> <p>Expected Action: N/A CW is <i>not</i> lost.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 9</p> <p>IF a SGTR has occurred as indicated by ANY of the following:</p> <ul style="list-style-type: none"> • Steam generator activities • Main steam line activities • Steam Generator level change without feed • Steam Generator blow down activities • One Steam Generator level rising faster than the other with feed and steaming rates similar in both Steam Generators • Radiation and contamination surveys of SG release points indicate abnormal activity • Feed flow mismatch between Steam Generators • Steam flow-feed flow mismatch in a Steam Generator prior to the trip • Safety Injection flow is needed to maintain pressurizer level after throttle criteria are met <p>THEN determine the most affected Steam Generator.</p> <p>Expected Action: N/A. SGTR has not occurred.</p>
	CRS	<p>Instruction 10</p> <p>IF a SGTR has NOT occurred, THEN GO TO step 26.</p> <p>Expected Action: CRS goes to Step 26.</p>
	CRS	<p>Instruction 26</p> <p>IF an ESD has occurred as indicated by ANY of the following:</p> <ul style="list-style-type: none"> • High steam flow from Steam Generator • Lowering steam generator pressure • Lowering steam generator level • Lowering RCS cold leg temperature • Lowering Pressurizer pressure • Lowering Pressurizer level <p>THEN determine the most affected Steam Generator.</p> <p>Expected Action: N/A. ESD has not occurred.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 27</p> <p>IF there are no indications of an ESD, THEN GO TO step 32.</p> <p>Expected Action: CRS goes to Step 32.</p>
	CRS	<p>Instruction 32</p> <p>Determine whether a LOAF has occurred by ANY of the following:</p> <ul style="list-style-type: none"> • Lowering Steam Generator levels • "LO SG 1 LVL CH TRIP" (5A09C) / "LO SG 2 LVL CH TRIP (5A10C) • "FWPT A TRIP CKT ENERGIZED" (6A03B) / FWPT B TRIP CKT ENERGIZED" (6A09B) • Low main feedwater pump flow (possible high flow for a feedwater line break) • Low main feedwater pump suction pressure • No auxiliary feedwater to both Steam Generators <p>Expected Action: CRS determines a LOAF is in progress.</p>
	CRS	<p>Instruction 33</p> <p>IF there are no indications of a LOAF, THEN GO TO step 38.</p> <p>Expected Action: N/A. CRS determines a LOAF is in progress.</p>
	CRS	<p>Instruction 34</p> <p>Stop all RCPs.</p> <p>Expected Action: N/A. RCPs already secured.</p> <p>Examiner Note: If the CRS previously entered 40EP-9EO06, Loss of All Feedwater, then RCPs would already be secured at this Step. Otherwise, RO secures RCP here.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 8		
Event Description: 86 Lockout of AFN-P01, Loss of All Feedwater		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 35</p> <p>Conserve steam generator inventory by performing the following:</p> <ul style="list-style-type: none"> a. Close the Blowdown Containment Isolation Valves. b. Close the Steam Generator Sample Valves. <p>Expected Action: Blowdown Containment Isolation Valves are already closed. BOP closes the 12 sample valves on B07 (SG SAMPLE ISOL area).</p>
	CRS	<p>Instruction 36</p> <p>Restore feed to at least one Steam Generator by performing ANY of the following:</p> <p>Auxiliary Feedwater</p> <ul style="list-style-type: none"> • Appendix 38, Resetting AFA-P01 • Appendix 39, Local Operation of AFB-P01 • Appendix 40, Local Operation of AFA-P01 Using Main Steam • Appendix 41, Local Operation of AFN-P01 • Appendix 42, Aligning Essential Aux Feedwater Pumps Suction to RMWT • Appendix 108, Local Operation of AFA-P01 Using Auxiliary Steam <p>Main Feedwater</p> <ul style="list-style-type: none"> • Appendix 43, Restarting MFPs <p>Expected Action: N/A. None of these appendices will work since all 3 AFW pumps are OOS or have failed and MFPs A & B have tripped on low vacuum.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Contingency Action 36.1</p> <p>IF Auxiliary or Main Feedwater can NOT be restored, THEN PERFORM ANY of the following:</p> <ul style="list-style-type: none">• Appendix 44, Feeding with the Condensate Pumps• Appendix 45, Feeding Unit 1 SGs with Unit 2 Condensate Pumps• Appendix 46, Feeding Unit 1 SGs with Unit 3 Condensate Pumps• Appendix 47, Feeding Unit 2 SGs with Unit 1 Condensate Pumps• Appendix 48, Feeding Unit 2 SGs with Unit 3 Condensate Pumps• Appendix 49, Feeding Unit 3 SGs with Unit 2 Condensate Pumps• Appendix 50, Feeding Unit 3 SGs with Unit 1 Condensate Pumps <p>Expected Action: CRS directs BOP to perform Appendix 44.</p>

40EP-9EO10, Standard Appendices, Standard Appendix 44, Feeding with the Condensate Pumps

	CRS	<p>NOTE</p> <p>KEY OPERATOR ACTION - Perfect performance of this Appendix will significantly reduce plant risk.</p> <p>Examiner Note:</p> <p>This Appendix directly relates to Key Operator Action #7 (1.5%) of the PRA: Depressurize Steam Generators and Supply Alternate Feedwater.</p>
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Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 1</p> <p>Determine which Steam Generator will be fed by the Condensate System by considering ALL of the following:</p> <ul style="list-style-type: none">• Steam Generator pressure (lowest pressure)• Steam Generator wide range level (lowest level)• Ability to be fed from the Condensate System <p>Expected Action: CRS selects one SG to feed.</p>
	BOP	<p>Instruction 2.a</p> <p>IF Steam Generator #1 was selected, THEN perform the following:</p> <p>Ensure BOTH SG 1 Downcomer Isolation Valves, are open:</p> <ul style="list-style-type: none">• SGA-UV-172• SGB-UV-130 <p>Expected Action: If SG #1 selected, BOP opens:</p> <ul style="list-style-type: none">• SGA-UV-172 using SGA-HS-172• SGB-UV-130 using SGB-HS-130 <p>Examiner Note: If SG #2 is selected, see Page 59???.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 2.b</p> <p>Place SG 1 Downcomer Control Valve in "MANUAL" and close SGN-FV-1113.</p> <p>Expected Action: If SG #1 selected, BOP closes SGN-FV-1113 using SGN-FIK-1113. Depresses the SEL button twice to advance the white indicating light to above the 3rd column (Output) on the controller. Then depresses the "DOWN" arrow to close the valve.</p>
	BOP	<p>Instructions 2.c & 2.d</p> <p>Ensure SGN-HV-1142, SG 1 Downcomer Block Valve, is open.</p> <p>Ensure SGN-HV-1143, SG 1 Downcomer Bypass Valve, is closed</p> <p>Expected Action: BOP checks valve positions on SGN-HS-1142 and SGN-HS-1143. Observes that HV-1142 is open and HV-1143 is closed.</p>
	BOP	<p>Instruction 2.e</p> <p>IF a MSIS has NOT occurred, THEN fast close ALL of the Economizer FWIVs:</p> <p>SG 1</p> <ul style="list-style-type: none"> • SGA-UV-174 • SGB-UV-132 <p>SG 2</p> <ul style="list-style-type: none"> • SGA-UV-177 • SGB-UV-137 <p>Expected Action: BOP depresses the following:</p> <p>SG 1</p> <ul style="list-style-type: none"> • SGA-HS-174C, ECONO FWIV FAST CLOSE UV-174 • SGB-HS-132C, ECONO FWIV FAST CLOSE UV-132 <p>SG 2</p> <ul style="list-style-type: none"> • SGA-HS-177, ECONO FWIV FAST CLOSE UV-177 • SGB-HS-137, ECONO FWIV FAST CLOSE UV-137

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 2.f</p> <p>IF using the Downcomer Bypass Valve to feed Steam Generator 1, THEN ensure SGN-HV-1142, SG 1 Downcomer Block Valve, is closed</p> <p>Expected Action: N/A. Bypass valve is not used.</p>
	BOP	<p>Instruction 2.g</p> <p>Ensure BOTH Steam Generator 2 Downcomer valves are closed:</p> <ul style="list-style-type: none"> • SGN-HV-1144, SG 2 Downcomer Block Valve • SGN-HV-1145, SG 2 Downcomer Bypass Valve <p>Expected Action: BOP checks valve positions on SGN-HS-1144 and SGN-HS-1145. Ensures that both valves are closed.</p>
	CRS	<p>Instruction 2.h</p> <p>GO TO step 4</p> <p>Expected Action: If SG #1 was selected, CRS goes to Step 4.</p>
	BOP	<p>Instruction 3.a</p> <p>IF Steam Generator #2 was selected, THEN perform the following:</p> <p>Ensure BOTH SG 2 Downcomer Isolation Valves, are open:</p> <ul style="list-style-type: none"> • SGA-UV-175 • SGB-UV-135 <p>Expected Action: If SG #2selected, BOP opens:</p> <ul style="list-style-type: none"> • SGA-UV-175 using SGA-HS-175 • SGB-UV-135 using SGB-HS-135

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 3.b</p> <p>Place SG 2 Downcomer Control Valve in "MANUAL" and close SGN-FV-1123.</p> <p>Expected Action: If SG #2 selected, BOP closes SGN-FV-1123 using SGN-FIK-1123. Depresses the SEL button twice to advance the white indicating light to above the 3rd column (Output) on the controller. Then depresses the "DOWN" arrow to close the valve.</p>
	BOP	<p>Instructions 3.c & 3.d</p> <p>Ensure SGN-HV-1144, SG 2 Downcomer Block Valve, is open.</p> <p>Ensure SGN-HV-1145, SG 2 Downcomer Bypass Valve, is closed</p> <p>Expected Action: BOP checks valve positions on SGN-HS-1144 and SGN-HS-1145. Observes that HV-1144 is open and HV-1145 is closed.</p>
	BOP	<p>Instruction 3.e</p> <p>IF a MSIS has NOT occurred, THEN fast close ALL of the Economizer FWIVs:</p> <p>SG 1</p> <ul style="list-style-type: none"> • SGA-UV-174 • SGB-UV-132 <p>SG 2</p> <ul style="list-style-type: none"> • SGA-UV-177 • SGB-UV-137 <p>Expected Action: BOP depresses the following:</p> <p>SG 1</p> <ul style="list-style-type: none"> • SGA-HS-174C, ECONO FWIV FAST CLOSE UV-174 • SGB-HS-132C, ECONO FWIV FAST CLOSE UV-132 <p>SG 2</p> <ul style="list-style-type: none"> • SGA-HS-177, ECONO FWIV FAST CLOSE UV-177 • SGB-HS-137, ECONO FWIV FAST CLOSE UV-137

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 3.f</p> <p>IF using the Downcomer Bypass Valve to feed Steam Generator 2, THEN ensure SGN-HV-1144, SG 2 Downcomer Block Valve, is closed</p> <p>Expected Action: N/A. Bypass valve is not used.</p>
	BOP	<p>Instruction 3.g</p> <p>Ensure BOTH Steam Generator 1 Downcomer valves are closed:</p> <ul style="list-style-type: none"> • SGN-HV-1142, SG 1 Downcomer Block Valve • SGN-HV-1143, SG 1 Downcomer Bypass Valve <p>Expected Action: BOP checks valve positions on SGN-HS-1142 and SGN-HS-1143. Observes that both valves are closed.</p>
	BOP	<p>Instruction 4</p> <p>Ensure at least ONE set of the following High Pressure Feedwater Heater isolation valves are open:</p> <p>HP Heater train A</p> <ul style="list-style-type: none"> • FWN-HV-73 • FWN-HV-101 <p>HP Heater train B</p> <ul style="list-style-type: none"> • FWN-HV-74 • FWN-HV-102 <p>Expected Action: BOP checks for red lights on at least 1 set of the following handswitches:</p> <p>HP Heater train A</p> <ul style="list-style-type: none"> • FWN-HS-73, TRAIN A INLET VLV • FWN-HS-101, TRAIN A OUTLET VLV <p>HP Heater train B</p> <ul style="list-style-type: none"> • FWN-HS-74, TRAIN B INLET VLV • FWN-HS-102, TRAIN B OUTLET VLV

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 8		
Event Description: 86 Lockout of AFN-P01, Loss of All Feedwater		
Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 5</p> <p>Ensure BOTH of the FWPTs are tripped by using the following:</p> <ul style="list-style-type: none"> • FTN-HS-51 for FWPT A • FTN-HS-52 for FWPT B <p>Expected Action: N/A. Both MFPs already tripped.</p>
	BOP	<p>Instruction 6</p> <p>Check BOTH FWPT Miniflow Valves are closed from the Control Room:</p> <ul style="list-style-type: none"> • FWN-FV-1 • FWN-FV-2 <p>Expected Action: BOP checks for a green light on the following:</p> <ul style="list-style-type: none"> • FWN-ZSH-ZSL-1, FW PUMP MINI-FLOW VLV POSITION FV-1 • FWN-ZSH-ZSL-2, FW PUMP MINI-FLOW VLV POSITION FV-2
	BOP	<p>Instruction 7</p> <p>Ensure at least ONE of the FWPT Discharge Valves are open from the Control Room:</p> <ul style="list-style-type: none"> • FWN-HV-31 • FWN-HV-32 <p>Expected Action: BOP checks for red lights on at least 1 of the following handswitches:</p> <ul style="list-style-type: none"> • FWN-HS-31, FWPT A DISCHARGE VLV • FWN-HS-32, FWPT B DISCHARGE VLV

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 8</p> <p>Ensure at least ONE set of the following Low Pressure Feedwater Heater isolation valves are open:</p> <p>LP Heater train A</p> <ul style="list-style-type: none"> • CDN-UV-214A • CDN-UV-214B <p>LP Heater train B</p> <ul style="list-style-type: none"> • CDN-UV-215A • CDN-UV-215B <p>LP Heater train C</p> <ul style="list-style-type: none"> • CDN-UV-216A • CDN-UV-216B <p>Expected Action: BOP checks for red lights on at least 1 of the following handswitches:</p> <ul style="list-style-type: none"> • CDN-HS-214A/214B, LP HEATER TRAIN A ISOL VLVS • CDN- HS-215A/215B, LP HEATER TRAIN B ISOL VLVS • CDN- HS-216A/216B, LP HEATER TRAIN C ISOL VLVS
	CRS	<p>Instruction 9</p> <p>IF ANY Condensate Pumps are running, THEN GO TO step 11.</p> <p>Expected Action: Since Condensate Pumps <i>are</i> running, CRS goes to Step 11.</p>
	RO	<p>Instruction 11</p> <p>IF RCS makeup is required, THEN perform the following:</p> <ol style="list-style-type: none"> a. Start all available charging pumps. b. Minimize letdown flow. c. Start one HPSI Pump. d. Open at least one HPSI Injection Valve. <p>Expected Action: CRS/BOP briefs RO on these conditions.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 12</p> <p>IF a MSIS or SIAS has NOT initiated, THEN lower or bypass the automatic initiation setpoint(s) for MSIS or SIAS as the cooldown and depressurization continues.</p> <p>Expected Action: BOP periodically lowers the setpoints by depressing all 4 of the following pushbuttons:</p> <ul style="list-style-type: none">• LO PZR PRESS SETPOINT RESET• LO SG PRESS SETPOINT RESET
	BOP	<p>Instruction 13</p> <p>PERFORM Appendix 5, RCS and Pressurizer Cooldown Log.</p> <p>Expected Action: This Appendix was already initiated.</p>
	BOP	<p>Instruction 14.a</p> <p>IF Steam Generator #1 was selected, THEN perform the following:</p> <p>Fast close Steam Generator #1 MSIVs by using the following pushbuttons:</p> <ul style="list-style-type: none">• SGA-HS-251• SGB-HS-253 <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 14.b</p> <p>Lower Steam Generator #1 pressure below the condensate pump discharge pressure using SG 1 ADVs</p> <p>Expected Action: BOP uses the manual thumbwheel on the following controllers to open one or both of the SG 1 ADVs:</p> <ul style="list-style-type: none"> • SGA-HIC-184A, SG 1 LINE 1 VALVE CONTROL • SGB-HIC-178A, SG 1 LINE 2 VALVE CONTROL <p>Examiner Note: Condensate Pumps will begin injecting at a SG pressure of 500-550 psig.</p>
	BOP	<p>Instruction 14.c</p> <p>Maintain Steam Generator #2 pressure less than 1200 psia.</p> <p>Expected Action: BOP uses the manual thumbwheel on the controllers to open one or both of the SG 2 ADVs as necessary.</p>
	CRS	<p>Instruction 14.d</p> <p>IF Steam Generator #1 is dry, THEN maintain feed flow rate of less than or equal to 1000 gpm (0.5x10⁶ lbm/hr).</p> <p>Expected Action: N/A. SG #1 is <i>not</i> dry.</p>
	BOP	<p>Instruction 14.e</p> <p>IF using SG 1 Downcomer Control valve, THEN throttle open SGN-FV-1113.</p> <p>Expected Action: BOP opens SGN-FV-1113 using SGN-FIK-1113. Depresses the SEL button twice to advance the white indicating light to above the 3rd column (Output) on the controller. Then depresses the "UP" arrow to open the valve.</p>

Op-Test No.: 2015 NRC Scenario No.: 1 Event No.: 8		
Event Description: 86 Lockout of AFN-P01, Loss of All Feedwater		
Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 14.f</p> <p>IF using SG 1 Downcomer Bypass valve, THEN throttle open SGN-HV-1143.</p> <p>Expected Action: N/A. Bypass valve is <i>not</i> used.</p>
	CRS	<p>Instruction 14.g</p> <p>GO TO step 16</p> <p>Expected Action: CRS goes to Step 16.</p>
	BOP	<p>Instruction 15.a</p> <p>IF Steam Generator #2 was selected, THEN perform the following:</p> <p>Fast close Steam Generator #2 MSIVs by using the following pushbuttons:</p> <ul style="list-style-type: none"> • SGA-HS-250 • SGB-HS-252 <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 15.b</p> <p>Lower Steam Generator #2 pressure below the condensate pump discharge pressure using the ADVs</p> <p>Expected Action: BOP uses the manual thumbwheel on the following controllers to open one or both of the SG 2 ADVs:</p> <ul style="list-style-type: none"> • SGB-HIC-185A, SG 2 LINE 1 VALVE CONTROL • SGA-HIC-179A, SG 2 LINE 2 VALVE CONTROL <p>Examiner Note: Condensate Pumps will begin injecting at a SG pressure of 500-550 psig.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 15.c</p> <p>Maintain Steam Generator #1 pressure less than 1200 psia.</p> <p>Expected Action: BOP uses the manual thumbwheel on the controllers to open one or both of the SG 1 ADVs as necessary.</p>
	CRS	<p>Instruction 15.d</p> <p>IF Steam Generator #2 is dry, THEN maintain feed flow rate of less than or equal to 1000 gpm (0.5x10⁶ lbm/hr).</p> <p>Expected Action: N/A. SG #2 is <i>not</i> dry.</p>
	BOP	<p>Instruction 15.e</p> <p>IF using Downcomer Control valve, THEN throttle open SGN-FV-1123.</p> <p>Expected Action: BOP opens SGN-FV-1123 using SGN-FIK-1123. Depresses the SEL button twice to advance the white indicating light to above the 3rd column (Output) on the controller. Then depresses the "UP" arrow to open the valve.</p>
	CRS	<p>Instruction 15.f</p> <p>IF using Downcomer Bypass valve, THEN throttle open SGN-HV-1145.</p> <p>Expected Action: N/A. Bypass valve is <i>not</i> used.</p>
	CREW	<p>Instruction 16</p> <p>Determine adequate feed flow by the following:</p> <ul style="list-style-type: none"> • Indicated feed flow • Steam Generator level increasing • RCS temperature dropping or stable <p>Expected Action: Crew uses various indications to observe that feed flow is indicated, the selected SG levels are increasing, and RCS temperature is dropping.</p>

Op-Test No.: **2015 NRC** Scenario No.: **1** Event No.: **8**

Event Description: **86 Lockout of AFN-P01, Loss of All Feedwater**

Time	Position	Applicant's Actions or Behavior
		Instruction 17 Restore selected Steam Generator level to between 45 - 60% NR. Expected Action: BOP observes that the selected SG NR level indicators are rising.
		Instruction 18 Maintain selected Steam Generator pressure stable using the ADVs. Expected Action: BOP uses the manual thumbwheel on the controllers to manipulate one or both of the selected SG ADVs as necessary.
		Instruction 19 IF a MSIS or SIAS has NOT been initiated, THEN lower or bypass the automatic initiation setpoint(s) for the unselected Steam Generator as the cooldown continues. Expected Action: BOP periodically lowers the setpoints by depressing all 4 of the following pushbuttons: <ul style="list-style-type: none">• LO PZR PRESS SETPOINT RESET• LO SG PRESS SETPOINT RESET
CRITICAL TASK: Establish feedwater flow from the Condensate Pumps and feed the selected/depressurized SG prior to opening of the primary safeties.		SAT / UNSAT
Examiner Note: The scenario may be ended once the selected Steam Generator is being fed to at a rate that raises SG level, and/or lowers/stabilizes RCS temperature.		

Facility: PVNGS Scenario No.: 2 (Rev. 2) Op-Test No.: NRC - 2015

Examiners: _____ Operators: _____

Initial Conditions:(100% power, MOC).

Turnover:See attached

Event No.	Malf. No.	Event Type*	Event Description
1	None	N RO/SRO	Remove Pressurizer from boron equalization in accordance with 40OP-9ZZ05, Power Operations, Appendix H.6.
2	mfSI03C	C RO/SRO (TS)	SIT-1A gas leak. The crew initially responds in accordance with the alarm procedure for 40AL-9RK2C, SIT 1A-1B PRESS LOW (PZR INTLK). The ARP directs the crew to check SIT vent valves, potential drain lineups, and RDT level. If pressure is low, the ARP directs the crew to raise pressure using 40OP-9SI03, Safety Injection Tank Operations. [LCO 3.5.1 Condition B]
3	cmTRRX05RCNTT111Y_1	I BOP/SRO (AOP)	RCN-TT-111Y, Tcold Channel 1, fails LOW. Alarm response procedure 40AL-9RK4A is referenced for operator response. 40AL-9RK4A directs the crew to determine if an instrument failure has occurred. If so, the ARP directs the crew to transition to 40AO-9ZZ16, RRS Malfunctions.
4	mfCC02A	C RO/BOP/ SRO (AOP/TS)	Loss of Nuclear Cooling Water due to leak in discharge header. The crew implements 40AO-9ZZ03, Loss of Cooling Water, Section 4.0. During the event, letdown isolates and the RO performs 40AO-9ZZ05, Loss of Letdown. [LCO 3.4.9, Condition A] [LCO 3.7.7, Condition A]
5	mfFW12A	M ALL	Feedwater Line Break Inside Containment (Economizer) (Trip Initiator). Crew may initiate a manual Reactor Trip and enter 40EP-9EO01, Standard Post Trip Actions. The CRS uses Section 4.0, Diagnostic Actions, to determine that an ESD is in progress and transitions to 40EP-9EO05, Excess Steam Demand.
6	mfRP07A mfRH01B	C RO/BOP/ SRO	Train "A" BOP ESFAS Sequencer fails on trip SIB-P03, CS Pump "B," trips after start (CRITICAL TASK: Start CS Pump "A" prior to exiting the SPTAs.)
7	cmCPFW07AFBP01_5	C BOP/SRO	AFB-P01, AF Pump "B," fails to automatically start (CRITICAL TASK: Start Auxiliary Feedwater Pump "B" or "N" and establish feed to the unaffected SG prior to opening the primary safeties.) (CRITICAL TASK: Control primary and secondary systems to prevent lifting the primary safeties.)
End point	N/A	ALL	Scenario may be terminated when SG #2 level is being maintained 45-60% NR, at the discretion of the Lead Examiner.

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	7
2. Malfunctions after EOP entry (1-2)	2
3. Abnormal events (2-4)	2
4. Major transients (1-2)	1
5. EOPs entered/requiring substantive actions (1-2)	1
6. EOP contingencies requiring substantive actions (0-2)	0
7. Critical tasks (2-3)	2

CRITICAL TASK	JUSTIFICATION	REFERENCES
Start CS Pump “A” prior to exiting the SPTAs.	<p>Failure to initiate Containment Spray when the Containment Spray Actuation Setpoint is reached could unnecessarily complicate mitigation strategies. Without spray on a FWLB, Containment pressure and temperature will be higher than expected and could unnecessarily result in harsh conditions in Containment and could result in degradation of a fission product barrier.</p> <p>Step 9.d of 40EP-9EO01, Standard Post Trip Actions, requires the crew to ensure Containment Spray Actuation Signal (CSAS) is actuated if containment pressure exceeds 8.5 psig. 40DP-9AP06, SPTAs Technical Guidelines, Instruction Step: 9 Containment Temperature, Pressure and Combustible Gas Control, states: “Ensure that at least one containment spray header is providing greater than the minimum required flow to maintain containment pressure below design pressure.”</p>	<ul style="list-style-type: none"> PVNGS CT SPTA-4, When the Containment Spray Actuation setpoint is exceeded, ensure adequate Containment Spray to meet Safety Function prior to the completion of the SPTAs. CE SPTA-10 (CT-15), Establish Containment Temperature and Pressure Control. 40DP-9AP06, SPTAs Technical Guidelines, Instruction Step: 9
Control primary and secondary systems to prevent lifting the primary safeties.	<p>40DP-9AP10, Excess Steam Demand Technical Guideline, states: “The second action is to stabilize RCS temperature and pressure. It is important to establish heat removal capability via the unaffected SG prior to the affected SG boiling dry.” Failure to stabilize RCS temperature could lead to a solid Pressurizer, Pressurized Thermal Shock (PTS) of the RCS, or result in exceeding post accident Pressure/Temperature (P/T) limits. Either of these events will unnecessarily alter mitigation strategies.</p>	<ul style="list-style-type: none"> PVNGS CT ESD-1, Following a plant overcooling, stabilize RCS Temperature and operate Safety Injection to prevent lifting the primary safeties. CE ESDE-05, Establish RCS Temperature Control, ESDE-06, Establish RCS Pressure Control.
Start Auxiliary Feedwater Pump “B” or “N” and establish feed to the unaffected SG prior to opening the	<p>40DP-9AP10, Excess Steam Demand Technical Guideline, 3.2, Procedure Strategy, states: “The second action is to stabilize RCS temperature and</p>	<ul style="list-style-type: none"> PVNGS CT ESD-2 CE ESDE-08 (CT-08), Establish a RCS Heat

<p>primary safeties.</p>	<p>pressure. It is important to establish heat removal capability via the unaffected SG prior to the affected SG boiling dry.” Failure to stabilize RCS temperature could lead to a solid Pressurizer, Pressurized Thermal Shock (PTS) of the RCS, or result in exceeding post accident Pressure/Temperature (P/T) limits. Either of these events will unnecessarily alter mitigation strategies. If Auxiliary Feedwater Pump “B” is not started, it will not be possible to stabilize RCS temperature.</p> <p>40DP-9AP17, Standard Appendices Technical Guideline, Appendix 2, Figures, states: “The upper subcooling limit curve is used to establish the maximum post-accident limit on subcooling to significantly reduce the possibility of pressurized thermal shock following a pressurized thermal shock transient.”</p> <p>40DP-9AP10, Excess Steam Demand Technical Guideline, Step Number: 21. Maintain RCS pressure within the P/T limits, states: “Basis: Maintaining the RCS within the acceptable limits of the post accident P/T curve ensures that:</p> <ul style="list-style-type: none"> • the cooldown rate is not exceeded • the core is covered by subcooled fluid • the concern for pressurized thermal shock is minimized by staying within the upper subcooled limit” <p>40DP-9AP10, Excess Steam Demand Technical Guideline, Step Number: 14. Stabilize RCS temperature, states: “The main objective following an overcooling event is to minimize the stresses on the reactor vessel, return RCS temperature to within the Post Accident P/T limits and establish stable RCS pressure and temperature until a cooldown to SDC entry conditions can be started.”</p>	<p>Removal</p> <ul style="list-style-type: none"> • 40DP-9AP10, Excess Steam Demand Technical Guideline, 3.2, Procedure Strategy • 40DP-9AP10, Excess Steam Demand Technical Guideline, Step Number: 14 • 40DP-9AP17, Standard Appendices Technical Guideline, Appendix 2, Figures • 40DP-9AP10, Excess Steam Demand Technical Guideline, Step Number: 21
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2015 NRC Scenario 2 Overview

Event 1	<p>The RO removes the Pressurizer from boron equalization in accordance with 40OP-9ZZ05, Power Operations, Appendix H.6. This RO, normal evolution involves deenergizing backup heaters, adjusting the Pressurizer Master Control, and placing the Spray Valve Selector in BOTH. After the Spray Valve Selector is placed in BOTH, the next event can be initiated.</p>
Event 2	<p>SIT-1A gas leak. The crew is alerted by the following:</p> <ul style="list-style-type: none"> • Annunciator SIT 1A-1B PRESS LOW (PZR INTLK) • Lowering pressure indications for SIT-1A on B03 and ERFDADS <p>The crew initially responds in accordance with the alarm procedure for 40AL-9RK2C, SIT 1A-1B PRESS LOW (PZR INTLK). The ARP directs the crew to check SIT vent valves, potential drain lineups, and RDT level. If pressure is low, the ARP directs the crew to raise pressure using 40OP-9SI03, Safety Injection Tank Operations. 40OP-9SI03 directs the operator to lineup nitrogen to the affected accumulator and raise pressure. Once pressure has been raised per the CRS direction, the nitrogen lineup is secured. Since pressure in SIT 1A drops below 600 psig, the CRS enters LCO 3.5.1, Safety Injection Tanks (SITs) – Operating, Condition A. The crew has 72 hours to restore the SIT to OPERABLE status.</p>
Event 3	<p>RCN-TT-111Y, Tcold Channel 1, fails LOW. The crew is alerted by the following:</p> <ul style="list-style-type: none"> • Annunciator 4A10B (AMI (AUTOMATIC MOTION INHIBIT)) • Annunciator 4A08B (TAVG-TREF HI-LO) • Lowered setpoint indication on RCN-LIC-110, Level Setpoint Control <p>Refer to Operator Information Manual, Page 60 of 88, RRS Functional. When TTY-111Y fails LOW, the input to the averaging circuit for Loop 1 Tave fails LOW. This causes the Loop 1 Tave input into the averaging circuit of both loop's Tave to be low. Since the selector switch at the RRS panel is selected to AVERAGE, the Tave output the PLCS will be low, reducing the Pressurizer level setpoint to near minimum. This causes letdown flow to increase. The AMI (AUTOMATIC MOTION INHIBIT) alarm actuates because the Loop 1 and Loop 2 Tave signals deviate by more than 5°F. In the SBCS, the Quick Open function of the bypass valves is blocked. A turbine runback demand signal will be sent to the RPCS, but no automatic action will occur until an actual runback actuation signal is generated (TLI or MFP Trip). In the DFWCS, the low Tave signal results in no feedwater flow, as the Reactor Trip Override Refill Demand senses that Tave is always below 564°F.</p> <p>B04A windows 8B (TAVG-TREF HI-LO) and 10B (AMI (AUTOMATIC MOTION INHIBIT)) are received and acknowledged. Alarm response procedure 40AL-9RK4A is referenced for operator response. 40AL-9RK4A directs the crew to determine if an instrument failure has occurred. If so, the ARP directs the crew to transition to 40AO-9ZZ16, RRS Malfunctions. The crew implements Section 3.0, Temperature Instrument Failures. The BOP first ensures that CEDMCS is NOT in Auto sequential. The RO takes control of the Pressurizer Level Controller to maintain level between 33 and 53% (may refer to Appendix A, Pressurizer Level Setpoint Program). The AOP also directs the crew to select the unaffected instrument Tave 2 (Loop 2) at the RRS Test Panel. Once the unaffected instrument has been selected, CEDMCS is placed in the desired mode, and the PLCS is returned to Remote Auto, the next</p>

2015 NRC Scenario 2 Overview

	event may be initiated.
Event 4	<p>Nuclear Cooling Water is lost due to a leak in the discharge header. The crew is alerted by the following:</p> <ul style="list-style-type: none"> • Annunciator 7A07A (NUC CLG WTR SYS TRBL) • Annunciator 7A07B (NCWS PMPS DSCH HDR PRESS HI-LO) • Reduced current on running NC Pump • Automatic start of standby NC Pump, with amber light. <p>The crew implements 40AO-9ZZ03, Loss of Cooling Water, Section 4.0. Since seal injection is in service, the crew has 10 minutes to restore cooling water to the RCPs. The AOP initially directs the crew to ensure an NC Pump is running. Since the leak is on the common discharge header, a running pump will still not deliver cooling flow to the RCPs. When the standby pump is started and discharge pressure is still low, the operators are directed to investigate for leaks. The Area 2 AO reports a significant leak on the common discharge header. The CRS should direct the BOP to secure any running pumps. The CRS refers to 40AO-9ZZ04, Reactor Coolant Pump Emergencies. The CRS should then direct the BOP perform Appendix A, Cross-connect EW to NC. Appendix A involves startup of a Spray Pond Pump and an Essential Cooling Water Pump. Nuclear cooling water is isolated from Containment and EW is aligned to NC. To limit heat load on EW and to ensure adequate cooling flow to the RCPs, flow to Normal Chilled Water is limited to 1 chiller. An Area Operator unlocks and throttles EWA-HCV-53, SDCHX A OUTLET ISOLATION, until all of the RCP low NC flow alarms are clear. Once the low flow alarms are clear, the BOP starts a Normal Chiller. When EW has been cross connected, the CRS enters LCO 3.7.7, Condition A, due to the inoperability of the cross-connected EW train.</p> <p>During the event, letdown isolates and the RO performs 40AO-9ZZ05, Loss of Letdown. If Pressurizer level exceeds 56%, the RO secures all charging pumps and the CRS enters LCO 3.4.9, Condition A.</p> <p>When the Normal Chiller is started, the next event can be initiated.</p>
Event 5	<p>Feedwater Line Break Inside Containment (Economizer) (Trip Initiator). The crew is alerted by the following:</p> <ul style="list-style-type: none"> • Annunciators: <ul style="list-style-type: none"> ○ 6A06A (FWCS PROCESS TRBL) ○ 7B03A (CNTMT SUMPS TRBL) ○ 7B03B (CNTMT SUMPS EXCESS LEAKAGE) • Containment pressure and temperature rising • Automatic initiation of SIAS, MSIS, CIAS and CSAS <p>Various other alarms on B04, B05, and B06 are received and acknowledged. Alarm response procedures 40AL-9RK6A and 40AL-9RK7B may be referenced for operator response. Operators will have little time between receipt of the first alarm and an automatic Reactor trip to implement the alarm response.</p> <p>Crew may initiate a manual Reactor Trip and enter 40EP-9EO01, Standard Post Trip Actions.</p>

2015 NRC Scenario 2 Overview

<u>Event 6</u>	<p>While implementing the SPTAs, the RO observes that the Train ‘A’ BOP ESFAS Sequencer failed and manually starts Train ‘A’ equipment. Since CS Pump ‘B’ trips on an 86 lockout, the RO must manually start CS Pump ‘A’ to ensure that containment spray flow is actuated following a CSAS.</p> <p>(CRITICAL TASK: Start CS Pump “A” prior to exiting the SPTAs.)</p> <p>While implementing the SPTAs, the BOP observes that AFB-P01, AF Pump “B,” failed to start and manually starts the pump. Since CSAS has actuated, either the RO or the BOP secures all RCPs and the RO uses auxiliary spray and heaters to control RCS pressure.</p> <p>The CRS uses Section 4.0, Diagnostic Actions, to determine that an ESD is in progress and transitions to 40EP-9EO05, Excess Steam Demand.</p> <p>In 40EP-9EO05, the RO ensures that all Train “A” BOP ESFAS equipment is running as required. MSIS is actuated and SG #1 is identified as the most affected SG. Standard Appendix 113 is used to isolate SG #1. The SG is isolated by closing ADVs, MSIVs, MSIV Bypass, Economizer FWIVs, Downcomer Isolation Valves, Blowdown Containment Isolation Valves, steam trap isolation valves, AFA Steam Supply Valves, and AFW Isolation Valves. RCS temperature is stabilized by steaming the <i>least</i> affected SG.</p> <p>(CRITICAL TASK: Start Auxiliary Feedwater Pump “B” or “N” and establish feed to the unaffected SG prior to opening the primary safeties.)</p> <p>(CRITICAL TASK: Control primary and secondary systems to prevent lifting the primary safeties.)</p>
End Point	<p>Scenario may be terminated when SG #2 level is trending toward 45-60% NR, at the discretion of the Lead Examiner.</p>

TURNOVER

Plant Conditions:

- Unit 1 is at 100% power.
- The core is presently at 250 EFPD
- Risk Management Action Level is ORANGE
- AFA-P01 is out of service for unscheduled maintenance
- AFN-P01 and AFB-P01 are protected
- PC is NOT recircing the RWT
- Unit 2 is supplying the Aux Steam cross-tie header
- At the request of Chemistry, the pressurizer is in boron equalization in accordance with 40OP-9ZZ05, Power Operations

Equipment Out of Service:

- AFA-P01 is under clearance for maintenance. LCO 3.7.5, Condition A and Condition B, have been entered. The pump is expected to return to service in 8 hours.

Planned Shift Activities:

- Chemistry has reported that the Pressurizer and RCS boron concentrations are within 10 ppm. The SM therefore directs you to remove the Pressurizer from boron equalization in accordance with 40OP-9ZZ05, Power Operations, Appendix H.6

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **1**Event Description: **Remove the Pressurizer from boron equalization**

Time	Position	Applicant's Actions or Behavior
T=0	CRS	Directs the RO to remove the Pressurizer from boron equalization in accordance with 40OP-9ZZ05, Power Operations, Appendix H.6

40OP-9ZZ05, Power Operations, Appendix H.6

	RO	<p>Instructions H.6 & H.6.1</p> <p>WHEN the SM/CRS directs stopping boron equalization of the pressurizer, THEN perform the following:</p> <p>IF boron equalization is in service because of a difference in boron concentration between the pressurizer and the reactor coolant loops, THEN direct Chemistry to perform boron samples on BOTH of the following:</p> <ul style="list-style-type: none">• Pressurizer• RCS <p>Expected Action: Per Turnover, Chemistry reported that Pressurizer and RCS boron concentrations are within 10 ppm.</p>
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Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **1**Event Description: **Remove the Pressurizer from boron equalization**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instructions H.6.2 through H.6.2.1.3</p> <p>WHEN Chemistry confirms Pressurizer and RCS boron concentration are within 10 ppm, THEN perform the following at the direction of the SM/CRS:</p> <p>IF the SM/CRS directs de-energizing RCN-HS-100-6, Backup Heaters Bank, THEN perform the following:</p> <p>Take RCN-HS-100-6, Backup Heaters Bank, to OFF.</p> <p>Check white setpoint override light is off at RCN-HS-100-6, Backup Heaters Bank.</p> <p>Check green open light is on at RCN-HS-100-6, Backup Heaters Bank.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instructions H.6.2.2 through H.6.2.2.3</p> <p>IF the SM/CRS directs de-energizing RCN-HS-100-7, Backup Heaters Bank, THEN perform the following:</p> <p>Take RCN-HS-100-7, Backup Heaters Bank, to OFF.</p> <p>Check white setpoint override light is off at RCN-HS-100-7, Backup Heaters Bank.</p> <p>Check green open light is on at RCN-HS-100-7, Backup Heaters Bank.</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **1**Event Description: **Remove the Pressurizer from boron equalization**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instructions H.6.2.3 through H.6.2.3.3</p> <p>IF the SM/CRS directs de-energizing RCN-HS-100-8, Backup Heaters Bank, THEN perform the following:</p> <p>Take RCN-HS-100-8, Backup Heaters Bank, to OFF.</p> <p>Check white setpoint override light is off at RCN-HS-100-8, Backup Heaters Bank.</p> <p>Check green open light is on at RCN-HS-100-8, Backup Heaters Bank.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instructions H.6.2.4 through H.6.2.4.3</p> <p>IF the SM/CRS directs de-energizing RCN-HS-100-9, Backup Heaters Bank, THEN perform the following:</p> <p>Take RCN-HS-100-9, Backup Heaters Bank, to OFF.</p> <p>Check white setpoint override light is off at RCN-HS-100-9, Backup Heaters Bank.</p> <p>Check green open light is on at RCN-HS-100-9, Backup Heaters Bank.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instructions H.6.2.5 through H.6.2.5.3</p> <p>IF the SM/CRS directs de-energizing RCA-HS-100-4, Backup Heaters Bank, THEN perform the following:</p> <p>Take RCA-HS-100-4, Backup Heaters Bank, to OFF.</p> <p>Check white setpoint override light is off at RCA-HS-100-4, Backup Heaters Bank.</p> <p>Check green open light is on at RCA-HS-100-4, Backup Heaters Bank.</p> <p>Expected Action: N/A. Class backup heaters normally NOT energized for boron equalization. .</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **1**Event Description: **Remove the Pressurizer from boron equalization**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instructions H.6.2.6 through H.6.2.6.3</p> <p>IF the SM/CRS directs de-energizing RCB-HS-100-5, Backup Heaters Bank, THEN perform the following:</p> <p>Take RCB-HS-100-5, Backup Heaters Bank, to OFF.</p> <p>Check white setpoint override light is off at RCB-HS-100-5, Backup Heaters Bank.</p> <p>Check green open light is on at RCB-HS-100-5, Backup Heaters Bank.</p> <p>Expected Action: N/A. Class backup heaters normally NOT energized for boron equalization. .</p>
	RO	<p>Instruction H.6.3</p> <p>Raise RCN-PIC-100, Pressure Master Control, setpoint to ONE of the following:</p> <ul style="list-style-type: none"> • 2250 psia • At the direction of the SM/CRS <p>Expected Action: RO uses black thumbwheel on RCN-PIC-100 to raise setpoint to 2250 psia.</p>
	RO	<p>Instruction H.6.4</p> <p>IF BOTH of the following conditions exist:</p> <ul style="list-style-type: none"> • RCN-HS-100-10, Spray Valve Selector, is selected to one valve • Plant conditions will support returning RCN-HS-100-10, Spray Valve Selector, to BOTH <p>THEN place RCN-HS-100-10, Spray Valve Selector, to BOTH.</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **1**

Event Description: **Remove the Pressurizer from boron equalization**

Time	Position	Applicant's Actions or Behavior
		<p>Instruction H.6.5</p> <p>IF plant conditions will NOT support operating with RCN-HS-100-10, Spray Valve Selector, to BOTH, THEN place RCN-HS-100-10, Spray Valve Selector, at the direction of the SM/CRS.</p> <p>Expected Action: Plant supports use of "BOTH."</p>

Examiner Note: When the operator places the Spray Valve Selector in BOTH, **OR** at the discretion of the Lead Examiner, may proceed to next event.

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **2**Event Description: **Safety Injection Tank 1A Gas Leak**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Receives and acknowledges alarms. Operators are alerted by the following:</p> <ul style="list-style-type: none"> Annunciators: <ul style="list-style-type: none"> 2B12A (SIT PRESS HI/LO), 2B12B (SIT PRESS HI-HI/LO-LO) Annunciator RKA-UA-2C (SIT 1A-1B PRESS LOW (PZR INTLK)) Lowering pressure indications for SIT-1A on B03 and ERFDADS Computer alarms: <ul style="list-style-type: none"> SIP332 (SIT 1A NAR RANGE PRESS) SIP333 (SIT 1A PRESS) <p>Alarm response procedures 40AL-9RK2B and 40AL-9RK2C are referenced for alarm response.</p>

40AL-9RK2C, SIT 1A-1B PRESS LOW (PZR INTLK)

	RO	<p>Operator Action 1 and 1.1</p> <p>Confirm the alarm by performing the following:</p> <p>Determine if pressurizer pressure is greater than 690 psia as indicated on ANY of the following:</p> <ul style="list-style-type: none"> L) PRZR Pressure PT-102A on pressure indicator RCA-PI-102A (B05) L) PRZR Pressure PT-102B on pressure indicator RCB-PI-102B (B05) L) PRZR Pressure PT-102C on pressure indicator RCC-PI-102C (B05) L) PRZR Pressure PT-102D on pressure indicator RCD-PI-102D (B05) R) PRZR Pressure PT-102A, on pressure recorder RCA-PR-102A ERFDADS RCP102A, Pressurizer Press (WR) CH A ERFDADS RCP102B, Pressurizer Press (WR) CH B <p>Expected Action: RO observes that all indications show that PZR pressure is greater than 690 psig.</p>
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Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **2**Event Description: **Safety Injection Tank 1A Gas Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action 1.2</p> <p>Determine if SIT 1A pressure is less than 610 psig as indicated on ANY of the following:</p> <ul style="list-style-type: none"> • L) SIT-1A Press PT-331, on pressure indicator SIA-PI-331 • L) SIT 1A Press PT-333, on pressure indicator SIA-PI-333 • ERFDADS SIP331, SI TK 1A PRESS (WR) <p>Expected Action: RO observes that SIT 1A pressure is less than 610 psig.</p>
	RO	<p>Operator Action1.3</p> <p>Determine if SIT 1B pressure is less than 610 psig as indicated on ANY of the following:</p> <ul style="list-style-type: none"> • R) SIT 1B Press PT-341, on pressure indicator SIA-PI-331 • R) SIT 1B Press PT-343, on pressure indicator SIA-PI-333 • ERFDADS SIP341, SI TK 1B PRESS (WR) <p>Expected Action: N/A. Leak is on SIT 1A.</p>
	RO	<p>Operator Action2</p> <p>IF power is supplied to the SIT vent valves, THEN take BOTH of the following keylock switches to OFF:</p> <ul style="list-style-type: none"> • SIT Vent Valves Power Supply, SIB-HS-18A • SIT Vent Valves Power Supply, SIA-HS-17A <p>Expected Action: N/A. Power is <i>not</i> supplied.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **2**Event Description: **Safety Injection Tank 1A Gas Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action3</p> <p>Check SIT vent valve position as indicated by ALL of the following handswitches:</p> <ul style="list-style-type: none"> • SIA-HS-607A, Safety Injection Tank 1A Vent Valve • SIB-HS-633A, Safety Injection Tank 1A Vent Valve • SIA-HS-608A, Safety Injection Tank 1B Vent Valve • SIB-HS-643A, Safety Injection Tank 1B Vent Valve <p>Expected Action: RO observes that all 4 vent valves are closed.</p>
	RO	<p>Operator Action4</p> <p>IF any SIT vent valve is NOT closed, THEN notify the SM/CRS.</p> <p>Expected Action: N/A. All 4 vent valves are closed.</p>
	RO	<p>Operator Action5</p> <p>Check SIT vent valve position as indicated by ALL the following ERFDADS valve position points:</p> <ul style="list-style-type: none"> • ERFDADS SIZS607, SI Tk 1A Vent • ERFDADS SIZS608, SI Tk 1B Vent • ERFDADS SIZS633, SI Tk 1A Vent • ERFDADS SIZS643, SI Tk 1B Vent <p>Expected Action: RO observes that all 4 vent valves are closed.</p>
	RO	<p>Operator Action6</p> <p>IF any SIT vent valve is NOT closed, THEN notify the SM/CRS.</p> <p>Expected Action: N/A. All 4 vent valves are closed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **2**Event Description: **Safety Injection Tank 1A Gas Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action 7</p> <p>Monitor ALL of the following level instruments for indications of leakage:</p> <ul style="list-style-type: none"> • SIA-LI-331 L) SIT 1A Level LT-331 • SIA-LI-331 R) SIT 1B Level LT-341 • SIN-LI-332 L) SIT 1A Level LT-332 • SIN-LI-332 R) SIT 1B Level LT-342 • SIN-LI-333 L) SIT 1A Level LT-333 • SIN-LI-333 R) SIT 1B Level LT-343 • RDN-LI-410 L) Cntmt Sump East LT-410 • RDN-LI-410 R) Cntmt Sump West LT-411 • CHN-LI-268 Reactor Drain Tank Level <p>Expected Action: As directed.</p>
	RO	<p>Operator Action8</p> <p>IF RDT level is rising, THEN close SIE-HV-661 using handswitch SIN-HS-661, Combined Sit & Misc Drn Hdr To RDT Vlv.</p> <p>Expected Action: N/A. RDT level is <i>not</i> rising.</p>
	RO	<p>Operator Action9</p> <p>IF any fill or drain lineup could result in an unexpected SIT 1A pressure or level lowering, THEN secure those lineups per the governing procedure.</p> <p>Expected Action: N/A. No fill or drain lineup could affect SIT 1A.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **2**Event Description: **Safety Injection Tank 1A Gas Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action10</p> <p>IF any fill or drain lineup could result in an unexpected SIT 1B pressure or level lowering, THEN secure those lineups per the governing procedure.</p> <p>Expected Action: N/A. Leak is on SIT 1A.</p>
	RO	<p>Operator Action11</p> <p>IF SIT 1A pressure OR level is affected, THEN restore SIT 1A pressure and level per 40OP-9SI03, Safety Injection Tank Operations.</p> <p>Expected Action: RO goes to 40OP-9SI03. See next Page.</p>
	RO	<p>Operator Action12</p> <p>IF SIT 1B pressure OR level is affected, THEN restore SIT 1B pressure and level per 40OP-9SI03, Safety Injection Tank Operations.</p> <p>Expected Action: N/A. Leak is on SIT 1A.</p>
	RO	<p>Operator Action13</p> <p>Notify Chemistry of any changes in SIT level.</p> <p>Expected Action: N/A. Level was <i>not</i> changed.</p>
	RO/CRS	<p>Operator Action14</p> <p>Ensure compliance with ANY of the following:</p> <ul style="list-style-type: none"> • TS 3.5.1 Safety Injection Tanks (SITs) – Operating • TS 3.5.2 Safety Injection Tanks (SITs) – Shutdown <p>Expected Action: RO prompts CRS to evaluate TS 3.5.1&TS 3.5.2. Since pressure in SIT 1A drops below 600 psig, the CRS enters LCO 3.5.1, Safety Injection Tanks (SITs) – Operating, Condition B.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **2**Event Description: **Safety Injection Tank 1A Gas Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action15</p> <p>IF a lineup was secured on SIT 1A, THEN perform independent verification on valves that were repositioned per 02DP-0ZZ01, Verification of Plant Activities.</p> <p>Expected Action: N/A. No fill or drain lineup secured.</p>
	RO	<p>Operator Action16</p> <p>IF a lineup was secured on SIT 1B, THEN perform independent verification on valves that were repositioned per 02DP-0ZZ01, Verification of Plant Activities.</p> <p>Expected Action: N/A. Leak is on SIT 1A.</p>

40OP-9SI03, Safety Injection Tank Operations, Section 6.1, Pressurizing the Safety Injection Tanks to Establish or Maintain Normal Pressure.

	RO	<p>Instruction 6.1.1, Prerequisites</p> <p>Safety Injection Tanks (SIT) and Reactor Coolant System (RCS) configuration support pressurization of the SIT.</p> <p>High pressure nitrogen is in service per 40OP-9GA01, Service Gases.</p> <p>Expected Action: Prerequisites are met.</p>
	RO	<p>Instruction 6.1.2, Initial Condition</p> <p>6.1.2.1 Section 5.0, Prerequisites and Initial Conditions, is complete.</p> <p>Expected Action: Initial Conditions are met.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **2**Event Description: **Safety Injection Tank 1A Gas Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instructions, Instruction 6.1.3.1.</p> <p>IF the SIT is currently filled and pressurized AND requires pressurization to maintain operability, THEN GO TO Step 6.1.3.4.</p> <p>Expected Action: RO goes to Step 6.1.3.4.</p>
	RO	<p>NOTE</p> <p>The ADV accumulator low pressure alarm may come in while pressurizing a SIT from a depressurized state. Adjusting the High Pressure Nitrogen Regulator may cause an overpressure condition in the ADV accumulator when the SIT pressurization is complete</p>
	RO	<p>Instruction 6.1.3.4.</p> <p>OpenGAA-UV-1 using GAA-HS-1, HP N2 TO SI TANKS.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 6.1.3.5.</p> <p>Open the nitrogen supply valve for the SIT to be pressurized:</p> <ul style="list-style-type: none"> • SIB-HV-612 using SIB-HS-612, NITROGEN TO SIT 2A VLV • SIB-HV-622 using SIB-HS-622, NITROGEN TO SIT 2B VLV • <i>SIB-HV-632 using SIB-HS-632, NITROGEN TO SIT 1A VLV</i> • SIB-HV-642 using SIB-HS-642, NITROGEN TO SIT 1B VLV <p>Expected Action: RO opens SIB-HV-632.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **2**Event Description: **Safety Injection Tank 1A Gas Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 6.1.3.6.</p> <p>Open the nitrogen supply valve for the SIT to be pressurized to commence pressurization:</p> <ul style="list-style-type: none"> • SIA-HV-619 using SIA-HS-619, NITROGEN TO SIT 2A VLV • SIA-HV-629 using SIA-HS-629, NITROGEN TO SIT 2B VLV • <i>SIA-HV-639 using SIA-HS-639, NITROGEN TO SIT 1A VLV</i> • SIA-HV-649 using SIA-HS-649, NITROGEN TO SIT 1B VLV <p>Expected Action: RO opens SIA-HV-639.</p>
	RO	<p>Instruction 6.1.3.7.</p> <p>WHEN SIT pressure is at the desired pressure, THEN close the nitrogen supply valve opened in Step 6.1.3.6 to stop pressurization:</p> <ul style="list-style-type: none"> • SIA-HV-619 using SIA-HS-619, NITROGEN TO SIT 2A VLV • SIA-HV-629 using SIA-HS-629, NITROGEN TO SIT 2B VLV • <i>SIA-HV-639 using SIA-HS-639, NITROGEN TO SIT 1A VLV</i> • SIA-HV-649 using SIA-HS-649, NITROGEN TO SIT 1B VLV <p>Expected Action: RO closes SIA-HV-639.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **2**Event Description: **Safety Injection Tank 1A Gas Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 6.1.3.8.</p> <p>Close the nitrogen supply valve opened in Step 6.1.3.5:</p> <ul style="list-style-type: none"> • SIB-HV-612 using SIB-HS-612, NITROGEN TO SIT 2A VLV • SIB-HV-622 using SIB-HS-622, NITROGEN TO SIT 2B VLV • <i>SIB-HV-632 using SIB-HS-632, NITROGEN TO SIT 1A VLV</i> • SIB-HV-642 using SIB-HS-642, NITROGEN TO SIT 1B VLV <p>Expected Action: RO closes SIB-HV-632.</p>
	RO	<p>Instruction 6.1.3.9.</p> <p>Repeat Steps 6.1.3.1 through 6.1.3.8 until desired SIT pressure is reached.</p> <p>Expected Action: N/A. Repeats <i>not</i> necessary.</p>
	RO	<p>Instruction 6.1.3.10.</p> <p>WHEN pressurization of SITs is complete, THEN close GAA-UV-1 using GAA-HS-1, HP N2 TO SI TANKS.</p> <p>Expected Action: As directed.</p>
<p>Examiner Note: Once GAA-UV-1 is closed, OR at the discretion of the Lead Examiner, may proceed to the next event.</p>		

Op-Test No.: **2015 NRC**Scenario No.: **2**Event No.: **3**Event Description: **RCN-TT-111Y, Tcold Channel 1, fails LOW**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Alarms are received and acknowledged. The crew is alerted by the following:</p> <ul style="list-style-type: none"> • Annunciator 4A10B (AMI (AUTOMATIC MOTION INHIBIT)) • Annunciator 4A08B (TAVG-TREF HI-LO) • Lowered setpoint indication on RCN-LIC-110, Level Setpoint Control <p>Alarm response procedure 40AL-9RK4A is referenced for operator response.</p> <p>Examiner Note: CRS may elect to enter 40AO-9ZZ16, RRS Malfunction, directly. BOP may still reference ARP. See Page 21 for ARP actions.</p>

40AO-9ZZ16, RRS Malfunction, Section 3.0, Temperature Instrument Failures

	CRS	<p>Instruction 1.</p> <p>Enter AOP Entry Time and Date:</p> <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 2.</p> <p>Ensure that CEDMCS is NOT in Auto Sequential.</p> <p>Expected Action: BOP places CEDMCS Mode Switch in any position other than "AS."</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **3**Event Description: **RCN-TT-111Y, Tcold Channel 1, fails LOW**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 3.</p> <p>Check that pressurizer level is trending to the proper setpoint for reactor power:</p> <ul style="list-style-type: none">• REFER TO Appendix A, Pressurizer Level Setpoint Program. <p>Expected Action: CRS/RO refers to Appendix A. Notes that setpoint is not at proper level for current reactor power.</p>
	CRS	<p>CONTINGENCY ACTIONS</p> <p style="text-align: center;">NOTE</p> <p>Charging Pumps may cycle and letdown perturbations may occur when pressurizer level setpoint deviates from actual level or when the setpoint is restored to match actual level.</p>

Op-Test No.: **2015 NRC**Scenario No.: **2**Event No.: **3**Event Description: **RCN-TT-111Y, Tcold Channel 1, fails LOW**

Time	Position	Applicant's Actions or Behavior
	RO	<p>CONTINGENCY ACTION 3.1.</p> <p>Perform ALL of the following:</p> <ul style="list-style-type: none"> a. IF RCN-LIC-110, Pressurizer Level Control, is in Remote Automatic, THEN transfer RCN-LIC-110 to "MANUAL". b. Ensure RCN-LIC-110, Pressurizer Level Control, is in ONE of the following: <ul style="list-style-type: none"> • Local Automatic • Manual c. Maintain pressurizer level 33 to 53%. REFER TO Appendix A, Pressurizer Level Setpoint Program. d. Ensure adequate charging flow for present plant conditions. e. IF letdown isolates, THEN PERFORM 40AO-9ZZ05, Loss of Letdown. <p>Expected Action: RO places RCN-LIC-110, LEVEL SETPOINT CONTROL, in either of the following:</p> <ul style="list-style-type: none"> • Local Automatic, by sliding the lever to the left down to the "L" position and using the black thumbwheel to change setpoint. • Manual, by depressing the "MAN" pushbutton and using the slider below to change setpoint. <p>Examiner Note: RO may depress the MAN pushbutton, slide the lever to the left to the "L" position, then depress the AUTO pushbutton to place the controller in Local Automatic. Either method is acceptable.</p>

Op-Test No.: **2015 NRC**Scenario No.: **2**Event No.: **3**Event Description: **RCN-TT-111Y, Tcold Channel 1, fails LOW**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 4.</p> <p>Determine the failed instrument by observing ALL of the following:</p> <ul style="list-style-type: none"> • RCN-TT-111Y, Tcold • RCN-TT-121Y, Tcold • RCN-TT-111X, Thot • RCN-TT-121X, Thot • RCN-TR-100 (sum / avg circuit) <p>Expected Action: BOP observes that RCN-TT-111Y, Tcold Channel 1, has failed LOW.</p>
	CRS	<p>Instruction 5.</p> <p>IF RCN-TR-100 indicates a failed instrument in the TAVG circuit, THEN perform Attachment C-2, Determining the Failed TAVG Instrument, to determine the failed instrument.</p> <p>Expected Action: CRS N/As this step since failure is not in the Tavg circuit.</p>
	CRS	<p style="text-align: center;">NOTE</p> <p>Failure of a temperature instrument could affect COLSS if the failed instrument is still reading within its normal range.</p>

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 3

Event Description: RCN-TT-111Y, Tcold Channel 1, fails LOW

Time	Position	Applicant's Actions or Behavior																					
	CRS	<p>Instruction 6.</p> <p>Determine the impact of the failure. REFER TO Appendix B, Control System Response to Instrument Failures.</p> <p>Expected Action: CRS refers to Appendix B.</p> <p>Examiner Note: The applicable portion of Appendix B is excerpted below.</p> <table border="1"> <thead> <tr> <th colspan="5">Control System Response</th></tr> <tr> <th colspan="2">Failed Instrument</th><th>Selected To</th><th>RRS</th><th>SBCS</th><th>DFWCS</th></tr> </thead> <tbody> <tr> <td rowspan="2">Tc, RCN-TT-111Y/121Y Th, RCN-TT-111X/121X</td><td rowspan="2">Lo</td><td>Average</td><td> <ul style="list-style-type: none"> • AMI on 5°F deviation between Loop 1 and Loop 2 Tavg • Low Tavg signal sent to PLCS resulting in minimum level setpoint </td><td> <ul style="list-style-type: none"> • Low Tavg from RRS blocks Quick Open on reactor trip • Low Tavg sends turbine runback demand to RPCS on a cutback </td><td> <ul style="list-style-type: none"> • Low Tavg signal from RRS to Reactor Trip Override Refill Demand resulting in no feed flow after reactor trip </td></tr> <tr> <td>Affected Instrument</td><td> <ul style="list-style-type: none"> • Low Tavg signal sent to PLCS resulting in minimum level setpoint • CEA withdrawal if in Auto Sequential </td><td> <ul style="list-style-type: none"> • Low Tavg from RRS blocks Quick Open on reactor trip • Low Tavg sends turbine runback demand to RPCS on a cutback </td><td> <ul style="list-style-type: none"> • Low Tavg signal from RRS to Reactor Trip Override Refill Demand resulting in no feed flow after reactor trip </td></tr> </tbody> </table>	Control System Response					Failed Instrument		Selected To	RRS	SBCS	DFWCS	Tc, RCN-TT-111Y/121Y Th, RCN-TT-111X/121X	Lo	Average	<ul style="list-style-type: none"> • AMI on 5°F deviation between Loop 1 and Loop 2 Tavg • Low Tavg signal sent to PLCS resulting in minimum level setpoint 	<ul style="list-style-type: none"> • Low Tavg from RRS blocks Quick Open on reactor trip • Low Tavg sends turbine runback demand to RPCS on a cutback 	<ul style="list-style-type: none"> • Low Tavg signal from RRS to Reactor Trip Override Refill Demand resulting in no feed flow after reactor trip 	Affected Instrument	<ul style="list-style-type: none"> • Low Tavg signal sent to PLCS resulting in minimum level setpoint • CEA withdrawal if in Auto Sequential 	<ul style="list-style-type: none"> • Low Tavg from RRS blocks Quick Open on reactor trip • Low Tavg sends turbine runback demand to RPCS on a cutback 	<ul style="list-style-type: none"> • Low Tavg signal from RRS to Reactor Trip Override Refill Demand resulting in no feed flow after reactor trip
Control System Response																							
Failed Instrument		Selected To	RRS	SBCS	DFWCS																		
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		Affected Instrument	<ul style="list-style-type: none"> • Low Tavg signal sent to PLCS resulting in minimum level setpoint • CEA withdrawal if in Auto Sequential 	<ul style="list-style-type: none"> • Low Tavg from RRS blocks Quick Open on reactor trip • Low Tavg sends turbine runback demand to RPCS on a cutback 	<ul style="list-style-type: none"> • Low Tavg signal from RRS to Reactor Trip Override Refill Demand resulting in no feed flow after reactor trip 																		

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 3

Event Description: RCN-TT-111Y, Tcold Channel 1, fails LOW

Time	Position	Applicant's Actions or Behavior
	RO/BOP	<p>Instruction 7.</p> <p>IF RRS is selected to ONE of the following:</p> <ul style="list-style-type: none"> • Average • The affected instrument <p>THEN perform BOTH of the following:</p> <ol style="list-style-type: none"> IF RCN-LIC-110, Pressurizer Level Control, is in Remote Automatic, THEN transfer RCN-LIC-110 to "MANUAL". Ensure RCN-LIC-110, Pressurizer Level Control, is in ONE of the following: <ul style="list-style-type: none"> • Local Automatic • Manual Perform Appendix C, Operation of the Reactor Regulation System, to select the unaffected instrument at the RRS Test Panel. <p>Expected Action: RO places RCN-LIC-110, LEVEL SETPOINT CONTROL, in either of the following:</p> <ul style="list-style-type: none"> • Local Automatic, by sliding the lever to the left down to the "L" position and using the black thumbwheel to change setpoint. • Manual, by depressing the "MAN" pushbutton and using the slider below to change setpoint. <p>BOP places the TAVG INPUT SELECTOR switch in the "TAVG 2 (LOOP 2)" position at the Reactor Regulating System Cabinet.</p> <p>Examiner Note: BOP uses Appendix C to accomplish this Step. See Page 22.</p>
	BOP	<p>Instruction 7 (there are currently two step 7s in this procedure, fed back to the procedure group).</p> <p>Check that Tavg/Tref mismatch is 3°F or less.</p> <p>Expected Action: BOP observes mismatch is less than 3°F on 1J-RCN-TR-100 on B04.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **3**Event Description: **RCN-TT-111Y, Tcold Channel 1, fails LOW**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 8.</p> <p>Place CEDMCS in the desired mode of operation.</p> <p>Expected Action: BOP places Mode Switch in position directed by CRS. (Most likely Auto Sequential [AS])</p>
	RO	<p>Instruction 9.</p> <p>IF Remote Automatic operation of the PLCS is desired, THEN perform the following:</p> <ol style="list-style-type: none"> Ensure RCN-LIC-110, Pressurizer Level Control, is in "MANUAL". Transfer RCN-LIC-110, Pressurizer Level Control, to Remote Automatic. <p>Expected Action: RO places RCN-LIC-110, LEVEL SETPOINT CONTROL, in Remote Auto by depressing the "AUTO" button.</p>
	CRS	<p>Instruction 10.</p> <p>GO TO the appropriate procedure for the current plant conditions.</p> <p>Expected Action: As directed.</p>

40AL-9RK4A, window 4A08B, TAVG-TREF HI-LO, Group B, Temperature Average – Temperature Reference Lo

	BOP	<p>First Priority Operator Action 1.</p> <p>IF there are no plant transients in progress, THEN determine if the alarm is caused by an instrument failure (RCN-TI-111X/111Y/121X/121Y or TLI).</p> <p>Expected Action: Crew notes that no plant transients are in progress. BOP observes that RCN-TT-111Y, Tcold Channel 1, has failed LOW.</p>
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Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **3**Event Description: **RCN-TT-111Y, Tcold Channel 1, fails LOW**

Time	Position	Applicant's Actions or Behavior
	BOP/CRS	<p>First Priority Operator Action 2.</p> <p>IF an instrument failure is indicated, THEN GO TO 40AO-9ZZ16, RRS Malfunction.</p> <p>Expected Action: BOP prompts CRS to implement 40AO-9ZZ16</p>

40AO-9ZZ16, Appendix C, Operation of the Reactor Regulation System

	BOP	<p>Instruction 1.a through 1.c</p> <p>IF a temperature instrument has failed, THEN perform the following:</p> <ol style="list-style-type: none"> REFER TO Attachment C-3, Reactor Regulation System Test Drawer Pushbutton Description, for descriptions of the Reactor Regulation System Test Drawer pushbuttons. <hr/> <p style="text-align: center;">NOTE</p> <p>DVM voltage going to zero when the TEST PROBE pushbutton is depressed indicates that all the other pushbutton inputs are disconnected.</p> <hr/> <ol style="list-style-type: none"> Press the TEST PROBE pushbutton. Check that DVM voltage indicates zero volts. <p>Expected Action: BOP pushes TEST PROBE pushbutton and verifies DVM voltage indicates zero.</p>
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Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 3

Event Description: RCN-TT-111Y, Tcold Channel 1, fails LOW

Time	Position	Applicant's Actions or Behavior								
	BOP	<p>Instruction 1.d and 1.e:</p> <p>d. Press the DVM pushbutton that corresponds to the TAVG to be selected:</p> <ul style="list-style-type: none">• TAVG1 (RCS Average Temperature Loop 1)• TAVG2 (RCS Average Temperature Loop 2)• TAVG (RCS Average Temperature) <p>e. Record voltage indicated on the DVM for the selected TAVG in the table below:</p> <table><tr><th>Pushbutton</th><th>DVM Voltage</th></tr><tr><td>TAVG1</td><td>Volts</td></tr><tr><td>TAVG2</td><td>Volts</td></tr><tr><td>TAVG</td><td>Volts</td></tr></table> <p>Expected Action: BOP presses the DVM button for TAVG 2 and records the value in the table above.</p>	Pushbutton	DVM Voltage	TAVG1	Volts	TAVG2	Volts	TAVG	Volts
Pushbutton	DVM Voltage									
TAVG1	Volts									
TAVG2	Volts									
TAVG	Volts									
	BOP	<p>Instruction 1.f and 1.g:</p> <p>f. Check that DVM voltage recorded in step 1.e. represents the normal TAVG for the current power per Attachment C-4, DVM Voltage and Associated Approximate Input Value.</p> <p>g. WHEN evaluation of DVM voltage is complete, THEN press the TEST PROBE pushbutton to disconnect the DVM from the input.</p> <p>Expected Action: BOP checks that voltage represents the normal TAVG for 100 percent power. The value should be between 5.5 and 5.8. BOP pushes the TEST PROBE pushbutton.</p>								

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **3**Event Description: **RCN-TT-111Y, Tcold Channel 1, fails LOW**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: center;">CAUTION</p> <p>Selecting AVG while the "TAVG DEVIATION" light is lit will generate an AMI.</p>
	BOP	<p>Instruction 1.h and 1.i:</p> <ul style="list-style-type: none"> h. Place the TAVG INPUT selector switch to the selected input: <ul style="list-style-type: none"> • TAVG1 (RCS Average Temperature Loop 1) • TAVG2 (RCS Average Temperature Loop 2) • TAVG (RCS Average Temperature) i. Inform the CRS of the status of the RRS panel. <p>Expected Action: BOP selects TAVG2 and informs the CRS.</p>
<p>Examiner Note: Once CEDMCS has been placed in Auto Sequential, OR when Lead Examiner deems appropriate, the next event may be initiated. (It may take some time before the PLCS is returned to Remote Automatic.)</p>		

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Alarms are received and acknowledged.</p> <p>The crew is alerted by the following:</p> <ul style="list-style-type: none"> Annunciators: <ul style="list-style-type: none"> 7A07A (NUC CLG WTR SYS TRBL) 7A07B (NCWS PMPS DSCH HDR PRESS HI-LO) 4D(E) (RCP 1A [1B, 2A, 2B] LO NCW FLOW) Reduced current on running NC Pump Automatic start of standby NC Pump, with amber light Computer alarms: <ul style="list-style-type: none"> NCPS108 (NCW SURGE TK PRESS) NCLS77 (NCW SURGE TK LEVEL) <p>Alarm response procedures 40AL-9RK4D and 4E and 40AL-9RK7A are referenced for operator response.</p>
40AL-9RK4D, window 4D01A, RCP 1A LO NCW FLOW (<i>all other windows similar</i>)		
	RO	<p>Operator Action 1.</p> <p>Check ALL of the following RCP Nuclear Cooling Water (NCW) return flows: (Panel B04)</p> <ul style="list-style-type: none"> NCN-FI-475, NCW FROM RCP 1A FLOW NCN-FI-474, NCW FROM RCP 1B FLOW NCN-FI-477, NCW FROM RCP 2A FLOW NCN-FI-476, NCW FROM RCP 2B FLOW <p>Expected Action: RO observes that RCP NCW flow on B04 is LOW.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action 2.</p> <p>Check ALL of the following RCP Nuclear Cooling Water (NCW) return temperatures: (Panel B04)</p> <ul style="list-style-type: none"> • NCN-TI-471, NCW FROM RCP 1A TEMPERATURE • NCN-TI-470, NCW FROM RCP 1B TEMPERATURE • NCN-TI-473, NCW FROM RCP 2A TEMPERATURE • NCN-TI-472, NCW FROM RCP 2B TEMPERATURE <p>Expected Action: RO observes that RCP NCW return temperatures on B04 are approximately 100°F and stable.</p>
	BOP	<p>Operator Action 3.</p> <p>Check the following RCP motor temperatures for ALL four RCPs on recorder RMN-TJR-2: (Panel B07)</p> <ul style="list-style-type: none"> • Motor Stator • Motor Journal Bearings, upper and lower • Motor Lower Thrust Bearing • Motor Anti-rotation Bearing <p>Expected Action: BOP observes RCP motor stator temperatures are slowly increasing on RMN-TJR-2.</p>
	BOP	<p>Operator Action 4.</p> <p>Ensure at least one Nuclear Cooling (NC) Pump is running by observing BOTH of the following for each pump: (Panel B07)</p> <ul style="list-style-type: none"> • NC pump handswitch red running light on • Pump AMP meter <p>Expected Action: BOP observes that NC Pump A is running and may observe that NC Pump B has auto-started (amber light).</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Operator Action 5.</p> <p>IF alarm window 7A07B, NCWS PMPS DSCH HDR PRESS HI-LO, is in alarm due to low system pressure AND the standby NC pump has not started, THEN start the standby NC pump using ONE of the following:</p> <ul style="list-style-type: none"> • NCN-HS-1 for NC Pump A • NCN-HS-2 for NC Pump B <p>Expected Action: If not already auto-started, BOP starts NC Pump B.</p>
	BOP	<p>Operator Action 6.</p> <p>IF the standby NC pump cannot be started OR alarm window 7A07B, NCWS PMPS DSCH HDR PRESS HI-LO, remains in alarm after starting the standby NC pump, THEN perform BOTH of the following:</p> <ul style="list-style-type: none"> • 40AO-9ZZ03, Loss of Cooling Water • 40AO-9ZZ04, Reactor Coolant Pump Emergencies <p>Expected Action: BOP prompts CRS to implement 40AO-9ZZ03 and 40AO-9ZZ04.</p>
	CREW	<p>Operator Action 7.</p> <p>Direct the Auxiliary Operators to inspect ALL of the following to determine cause(s) of alarm:</p> <ul style="list-style-type: none"> • NC pumps • NC heat exchangers • NC surge tank • NC pump breakers <p>Expected Action: As directed.</p> <p>AO Report: Area 1 or 2: Wait 3 minutes, and then report that there is a significant leak on the common discharge header. Area 3: Surge tank level is lowering steadily. The makeup valve is open.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: center;">CAUTION</p> <p>Opening NCB-UV-401 before NCA-UV-402 and NCB-UV-403 are opened will result in lifting the NC relief valve(s) in Containment.</p>
	BOP	<p>Operator Action 8.</p> <p>IF an inadvertent Containment Spray Actuation Signal (CSAS) has occurred, THEN perform ALL of the following:...</p> <p>Expected Action: N/A. CSAS has not occurred.</p>
	BOP	<p style="text-align: center;">NOTE</p> <p>A rising level in the Containment Radwaste Sumps may indicate lifting NC system relief valve(s) in the Containment.</p>
	BOP	<p>Operator Action 9.</p> <p>IF any NC System Containment Isolation Valve was opened in Step 8 above, THEN evaluate the level trends in the Containment Radwaste Sumps.</p> <p>Expected Action: N/A. No valves manipulated in Step 8.</p>
	BOP	<p style="text-align: center;">CAUTION</p> <p>Throttling flow through the shutdown cooling heat exchanger may cause EW pump discharge pressure to rise to the EW pump high discharge pressure alarm setpoint and could cause the heat exchanger thermal relief valve to lift.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Operator Action 10.</p> <p>IF Essential Cooling Water (EW) is cross connected to NC, THEN consider raising cooling water flow to the RCPs by throttling closed the shutdown heat exchanger outlet valve until ONE of the following conditions exists:</p> <ul style="list-style-type: none"> • RCP Low Nuclear Cooling Water Flow Alarm(s) is (are) clear. • EW System total flow is equal to but not less than 8,500 gpm. <p>Expected Action: N/A. EW not yet cross-connected to NC.</p>
	BOP	<p>Operator Action 11.</p> <p>IF ANY of the following conditions is observed:</p> <ul style="list-style-type: none"> • Rising level in the NC Surge Tank • Activity in the NC System as indicated on SQN-RU-6, NUCLEAR COOLING WATER SYSTEM RADIATION MONITOR, <p>THEN perform 40AO-9ZZ02, Excessive RCS Leakrate.</p> <p>Expected Action: N/A. Neither condition exists.</p>
40AL-9RK7A, Window 7A07B, NCWS PMPS DSCH HDRPRESS HI-LO		
	BOP	<p>Auto Action 1</p> <p>Standby pump will start if header pressure drops below 79 psig.</p>
	BOP	<p>NOTE</p> <p>Normal NCW header pressure is 90 psig.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>First Priority Operator Action 2 - LOW</p> <p>IF the stand-by Nuclear Cooling Water pump has NOT started, THEN start the stand-by pump.</p> <ul style="list-style-type: none"> • NCN-P01A, NCN-HS-0001 • NCN-P01B, NCN-HS-0002 <p>Expected Action: As directed.</p>
	BOP	<p>Second Priority Operator Action 1 - LOW</p> <p>Ensure NCW Expansion Tank pressure is greater than 2 psig.</p> <p>Expected Action: BOP directs AO to investigate.</p> <p>AO Report: NCW Surge Tank pressure is 5" H₂O and lowering.</p>
	BOP	<p>Second Priority Operator Action 2.</p> <p>IF NC pump discharge pressure cannot be returned to normal, THEN GO TO 40AO-9ZZ03, Loss of Cooling Water.</p> <p>Expected Action: BOP prompts CRS to implement 40AO-9ZZ03.</p>
40AO-9ZZ03, Loss of Cooling Water, Section 4.0, Nuclear Cooling Water		
	CRS	<p>Instruction 1</p> <p>Enter AOP Entry Time and Date:</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 2</p> <p>IF seal injection is NOT in service, AND cooling water is NOT restored to ANY operating RCP within three minutes of the initial loss, THEN perform the following:</p> <ul style="list-style-type: none"> a. Ensure the reactor is tripped. b. Stop all of the RCPs. c. Isolate controlled bleedoff. <p>Expected Action: N/A. Seal injection <i>is</i> in service.</p>
	CRS	<p>Instruction 3</p> <p>IF seal injection is in service, AND cooling water is NOT restored to ANY operating RCP within 10 minutes of the initial loss, THEN perform the following:</p> <ul style="list-style-type: none"> a. Ensure the reactor is tripped. b. Stop all of the RCPs. c. Isolate controlled bleedoff. <p>Expected Action: If low NCW flow alarms are not cleared within 10 minutes, CRS directs a Reactor trip. RO stops all 4 RCPs, and then isolates controlled bleedoff by closing the 4 individual bleedoff valves.</p> <p>Time cooling water lost (Low NCW flow alarms IN): _____</p> <p>Time cooling restored (Low NCW flow alarms clear): _____</p> <p>Total elapsed time: _____</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
		<p>Instruction 4</p> <p>IF no Nuclear Cooling Water pumps are running, THEN perform the following:</p> <ol style="list-style-type: none"> IF at least one Nuclear Cooling Water pump is available, THEN start the Nuclear Cooling Water Pump. IF electrical power must be restored to start a Nuclear Cooling Water Pump, THEN perform the following: <ol style="list-style-type: none"> Place both NC Pump handswitches in "PULL TO LOCK". PERFORM 40AO-9ZZ12, Degraded Electrical Power. <p>Expected Action: N/A. Standby pump is already started and both pumps have electrical power.</p>
	BOP	<p>Instruction 5</p> <p>IF at least one Nuclear Cooling Water pump is running, AND "NCWS PMPS DSCH HDR PRESS HI-LO" (7A07B) is in alarm due to low pressure, THEN perform the following:</p> <ol style="list-style-type: none"> Start the standby NC Pump. Check that no NC system leaks exist by performing the following: <ol style="list-style-type: none"> Direct an operator(s) to walkdown NC system piping. Evaluate indications and alarms on the control boards. <p>Expected Action: If not already auto-started, BOP starts NC Pump B using NCN-HS-0002.</p> <p>AO Report: Wait 3 minutes, and then report that there is a significant leak on the common discharge header. Surge tank level is lowering steadily. The makeup valve is open.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>CONTINGENCY ACTIONS 5.b.1& 5.b.2</p> <p>IF a leak exists outside containment, THEN isolate the leak.</p> <p>IF a leak outside containment can not be isolated, AND the CRS determines that NC should be shutdown, THEN ensure that both NC Pumps are stopped.</p> <p>Expected Action: CRS determines that the leak cannot be isolated. CRS directs BOP to stop BOTH NC Pumps.</p> <p>BOP stops NCN-P01A using NCN-HS-0001 and NCN-P01B using NCN-HS-0002</p>
	CRS	<p>Instruction 6</p> <p>IF ANY of the NC Containment Isolation Valves have failed closed, AND there is NOT a valid CSAS signal present, THEN perform the following:</p> <ol style="list-style-type: none"> Open ANY closed isolation valves. Evaluate Tech Spec 3.6.3, Containment Isolation Valves. <p>Expected Action: N/A. No CIVs have failed.</p>
	CRS	<p>Instruction 7</p> <p>IF the NC system has been restored, THEN GO TO the appropriate procedure for current plant conditions.</p> <p>Expected Action: N/A. NC not restored.</p>
	CRS	<p>Instruction 8</p> <p>IF ANY RCPs are operating, THEN PERFORM 40AO-9ZZ04, Reactor Coolant Pump Emergencies.</p> <p>Expected Action: CRS implements 40AO-9ZZ04 or may direct an operator to perform 40AO-9ZZ04.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 9</p> <p>IF the CRS directs cross-connecting EW to NC, AND ANY of the following conditions exist:</p> <ul style="list-style-type: none"> Any leak in the NC system piping will be isolated when cross-connected No NC system leakage exists THEN PERFORM Appendix A, Cross-connect EW to NC. <p>Expected Action: CRS directs BOP to perform Appendix A. See Page 36.</p>
	CRS	<p>Instruction 10</p> <p>IF a leak in the Nuclear Cooling Water System piping can NOT be isolated when cross-connecting EW and NC, THEN perform the following:</p> <ol style="list-style-type: none"> Ensure that the Reactor is tripped. Stop all of the RCPs. Isolate controlled bleedoff. GO TO the appropriate procedure for the current plant conditions. <p>Expected Action: N/A. Leak will be isolated.</p>
	CRS	<p>Instruction 11</p> <p>IF letdown is isolated, THEN PERFORM 40AO-9ZZ05, Loss of Letdown.</p> <p>Expected Action: CRS directs RO to perform 40AO-9ZZ05. See Page 40.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	CRS/BOP	<p>Instruction 12</p> <p>Direct an operator to ensure that ALL of the following valves are closed to isolate steam to the Aux and Rad Waste Buildings:</p> <ul style="list-style-type: none"> • ASN-V016, "ASN-PCV-010 INLET ISOL VALVE" • ASN-V017, "ASN-PCV-010 BYPASS VALVE" • ASN-VY20, "ASN-PCV-010 BYPASS VALVE" <p>Expected Action: As directed.</p>
	CRS	<p>Instruction 13</p> <p>IF a NC Pump becomes available for operation, AND Essential Cooling Water is NOT cross-connected with Nuclear Cooling Water, THEN perform the following to start a NC Pump:...</p> <p>Expected Action: N/A. NC is <i>not</i> available.</p>
	CRS	<p>CAUTION</p> <p>Stopping cooling water flow to operating RCPs may cause damage if not restored within three minutes without seal injection or 10 minutes with seal injection.</p>
	CRS	<p>Instruction 14</p> <p>IF a NC Pump becomes available for operation, AND Essential Cooling Water is cross-connected with Nuclear Cooling Water, THEN PERFORM ONE of the following to remove EW from service on the Nuclear Cooling Water System:...</p> <p>Expected Action: N/A. NC is <i>not</i> available</p>
	CRS	<p>Instruction 15</p> <p>IF Nuclear Cooling Water is restored, AND EW is supplying SFP cooling, THEN PERFORM ONE of the following to restore NC to SFP Cooling:...</p> <p>Expected Action: N/A. NC is <i>not</i> available</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 16</p> <p>WHEN Nuclear Cooling Water is restored, OR BOTH of the following conditions exist:</p> <ul style="list-style-type: none"> • The Reactor is shutdown, • All appropriate steps of this procedure have been completed, THEN GO TO the appropriate procedure for current plant conditions. <p>Expected Action: N/A. NC is <i>not</i> available</p>

40AO-9ZZ03, Loss of Cooling Water, Appendix A, Cross-connect EW to NC

	BOP	<p>Instruction 1</p> <p>Enter Appendix Entry Time and Date:</p> <p>Expected Action: As directed.</p>
	BOP	<p>NOTE</p> <p>Cross-connecting EW and NC renders the EW Train inoperable per LCO 3.7.7, Essential Cooling Water (EW) System. Refer to 40ST-9EC03 and 40DP-9OP37 for impacts on supported system operability.</p> <p>Examiner Note: Evaluation of 40ST-9EC03 and 40DP-9OP37 is normally an STA/SM function.</p>
	BOP	<p>NOTE</p> <p>The cross-connect of Essential Cooling Water Train A with Nuclear Cooling Water will be lost on a SIAS or Essential Cooling Water surge tank A low level.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 2</p> <p>IF cross-connecting Train A EW to NC, THEN ensure BOTH of the following pumps are operating:</p> <ul style="list-style-type: none"> • Spray Pond Pump A • Essential Cooling Water Pump A <p>Expected Action: On B02, BOP starts SP Pump A using HPA-HS-1 and starts EW Pump A using EWA-HS-1.</p>
	BOP	<p>Instruction 3</p> <p>IF cross-connecting Train B EW to NC, THEN ensure BOTH of the following pumps are operating:</p> <ul style="list-style-type: none"> • Spray Pond Pump B • Essential Cooling Water Pump B <p>Expected Action: N/A. Cross-connecting Train A EW to NC.</p>
	BOP	<p>Instruction 4</p> <p>Ensure that both Nuclear Cooling Water pump handswitches are in "PULL TO LOCK".</p> <p>Expected Action: On B07, BOP places the following in PTL:</p> <ul style="list-style-type: none"> • NCN-P01A, NCN-HS-0001 • NCN-P01B, NCN-HS-0002
	BOP	<p>Instruction 5</p> <p>Close NCN-UV-99, Nuclear Cooling Water Containment Header Return Valve.</p> <p>Expected Action: On B07, BOP closes NCN-UV-99 using NCN-HS-99.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6</p> <p>IF cross-connecting Train A EW to NC, THEN open BOTH of the following valves:</p> <ul style="list-style-type: none"> • EWA-UV-145, Cross-Tie Valve to Nuclear Cooling Water • EWA-UV-65, Cross-Tie Valve from Nuclear Cooling Water <p>Expected Action: On B02, BOP opens the following:</p> <ul style="list-style-type: none"> • EWA-UV-145 using EWA-HS-145 • EWA-UV-65 using EWA-HS-65
	BOP	<p>Instruction 7</p> <p>IF cross-connecting Train B EW to NC, THEN direct an operator to unlock and open BOTH of the following valves:</p> <ul style="list-style-type: none"> • EWB-HCV-146, "EW CROSS-TIE VLV TO NC" • EWB-HCV-66, "EW CROSS-TIE VLV TO NC" <p>Expected Action: N/A. Cross-connecting Train A EW to NC</p>
	BOP	<p>Instruction 8</p> <p>Ensure that no more than one Normal Chiller NC outlet valve is open.</p> <p>Expected Action: BOP observes that Normal Chiller B and C NC outlet valves are open. Secures either chiller then observes that its NC outlet valve closes.</p>
	BOP	<p style="text-align: center;">CAUTION</p> <p>When EWA-HCV-53, SDCHX A Outlet Isolation Valve, is throttled closed, EW pump discharge pressure may exceed the alarm setpoint and possibly lift the thermal relief valve PSV-0047 on the Shutdown Cooling Heat Exchanger.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 9</p> <p>IF cross-connecting Train A EW to NC, THEN direct an operator to unlock and throttle EWA-HCV-53, SDCHX A OUTLET ISOLATION, until ONE of the following conditions exists:</p> <ul style="list-style-type: none"> • All of the RCP low NC flow alarms are clear. • EW system flow lowers to 8500 gpm on EWN-FI-13. <p>Expected Action: BOP directs AO to slowly throttle EWA-HCV-53 until directed to stop (when RCP low NCW flow alarms clear).</p>
	BOP	<p style="text-align: center;">CAUTION</p> <p>When EWB-HCV-54, SDCHX B Outlet Isolation Valve, is throttled closed, EW pump discharge pressure may exceed the alarm setpoint and possibly lift the thermal relief valve PSV-0048 on the Shutdown Cooling Heat Exchanger.</p>
	BOP	<p>Instruction 10</p> <p>IF cross-connecting Train B EW to NC, THEN direct an operator to unlock and throttle EWB-HCV-54, SDCHX B OUTLET ISOLATION, until ONE of the following conditions exists:</p> <ul style="list-style-type: none"> • All of the RCP low NC flow alarms are clear. • EW system flow lowers to 8500 gpm on EWN-FI-14. <p>Expected Action: N/A. Cross-connecting Train A EW to NC</p>
	BOP	<p>Instruction 11</p> <p>Perform the following:</p> <ol style="list-style-type: none"> Ensure that all Normal Chiller NC outlet valves are closed. Start a Normal Chiller. <p>Expected Action: BOP secures the remaining chiller then observes that its NC outlet valve closes. BOP then starts one Normal Chiller and observes that its NC outlet valve opens.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
40AO-9ZZ05, Loss of Letdown		
	RO	Instruction 1 Enter AOP Entry Time and Date: Expected Action: As directed.
	RO	Instruction 2 IF the Pressurizer is solid, THEN perform the following:... Expected Action: N/A. PZR is not solid.
	RO	Instruction 3 Place RCN-LIC-110, PLCS Master Controller, in "MAN" and close the selected Letdown Control Valve(s). Expected Action: On B04,RO depresses the MAN pushbutton and lowers the setpoint to cause the Letdown Control Valves to close.
	RO	Instruction 4 Check that letdown backpressure is less than setpoint. Expected Action: On B03, RO checks that the red pointer on CHN-PIC-201, LETDOWN BACKPRESSURE CONTROL, is below the black pointer.
	RO	Instruction 5 IF pressurizer level is 33% or more AND rising, THEN ensure no more than one Charging Pump is running. Expected Action: RO ensures no more than one Charging Pumps is running.

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 6</p> <p>IF BOTH of the following conditions exist:</p> <ul style="list-style-type: none"> • The unit is in Mode 1, 2 or 3 • Pressurizer level is 56% or more and rising <p>THEN perform the following:</p> <ol style="list-style-type: none"> a. Enter LCO 3.4.9, Pressurizer, Condition A. b. Initiate actions in preparation for a Unit shutdown within 6 hours. <p>Expected Action: PZR level <i>may</i> be > 56% (depends on timing of actions). If so, CRS enters LCO 3.4.9, Pressurizer, Condition A.</p>
	RO	<p>Instruction 7</p> <p>Determine the cause of the loss of letdown (REFER TO Appendix E, Supplementary Information) by evaluating ANY of the following:</p> <ul style="list-style-type: none"> • PLCS failures • NC flow to Letdown Heat • Exchanger • SIAS/CIAS • CVCS component failures • Loss of IA • Loss of power <p>Expected Action: RO determines that a loss of NC flow is the cause.</p>
	RO	<p>Instruction 8</p> <p>IF RCS pressure is less than 1000 psia, AND it is desired to place the standby valve in service, THEN PERFORM Appendix F, Aligning Letdown Control And Backpressure Valves.</p> <p>Expected Action: N/A. RCS pressure is > 1000 psia.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 9</p> <p>IF the selected Letdown Control or Backpressure Control Valve(s) has failed, AND it is desired to place the standby valve in service, THEN PERFORM Appendix F, Aligning Letdown Control And Backpressure Valves.</p> <p>Expected Action: N/A. Standby valve will <i>not</i> be placed in service.</p>
	RO	<p>Instruction 10</p> <p>IF ALL of the following conditions exist:</p> <ul style="list-style-type: none"> • CHB-UV-515, Regen Hx Inlet Isolation, closed due to an invalid high temperature interlock • CHN-TI-221, Regenerative Heat Exchanger Letdown Temperature, indication is available • Letdown is desired... <p>Expected Action: N/A. Letdown will not be restored.</p>
	RO	<p>Instruction 11</p> <p>IF CHB-UV-523, Regen Hx Outlet Isolation is closed due to an invalid high temperature alarm, AND letdown is desired, THEN place CHB-HS-523, LETDOWN CTMT ISOL, to "OPEN".</p> <p>Expected Action: N/A. Letdown will not be restored.</p>
	RO	<p>Instruction 12</p> <p>IF the Pressurizer is solid, AND RCS pressure is less than 500 psia, THEN perform the following to restore letdown:...</p> <p>Expected Action: N/A. PZR is <i>not</i> solid.</p>
	RO	<p>Instruction 13</p> <p>IF letdown can be restored, THEN perform the following:...</p> <p>Expected Action: N/A. Letdown will not be restored.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	RO	Instruction 14 IF a plant shutdown or cooldown is needed, THEN perform the following: Expected Action: N/A. Plant shutdown or cooldown is not required at this time.
	RO	Instruction 15 IF a plant shutdown or cooldown is NOT needed, THEN PERFORM Appendix C, Extended Operations Without Letdown. Expected Action: RO implements Appendix C. See below.

40AO-9ZZ05, Appendix C, Extended Operations Without Letdown

	RO	Instruction 1 Enter Appendix Entry Time and Date: Expected Action: As directed.
	RO	Instruction 2 WHEN letdown can be restored, THEN GO TO Appendix A, Restoration of Letdown With A Pressurizer Steam Bubble. Expected Action: N/A. Letdown will not be restored.
	RO	<p style="text-align: center;">NOTE</p> Boron equalization should be minimized since it depletes RCS hydrogen. The reduction in RCS hydrogen concentration may require entry into chemistry actions levels that may cause the unit to be shutdown.

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	RO	Instruction 3 IF boron equalization is in progress, THEN stop boron equalization. Expected Action: N/A. Boron equalization is not in progress.
	RO	Instruction 4 Notify Chemistry that the plant will be operated with letdown flow isolated. Expected Action: Chemistry is notified.
	RO	<p style="text-align: center;">NOTE</p> RCP HP seal cooler inlet temperature is expected to rise to between 200°F and 220°F when seal injection is stopped. All other seal temperatures are expected to remain normal
	RO	<p style="text-align: center;">NOTE</p> Intentional entry into L.C.O. 3.4.9, Pressurizer, Condition A is prohibited.
	RO	Instruction 5 WHEN the CRS determines seal injection and charging are to be stopped, OR pressurizer level is 56% or more and rising, THEN perform the following: <ol style="list-style-type: none"> a. IF the unit is in Mode 1, 2 or 3, THEN ensure compliance with LCO 3.4.9, Pressurizer. b. Ensure controlled bleedoff is isolated on all standby RCP's prior to Seal 2 Outlet Temperature exceeding 250°F. c. Close the Seal Injection Flow Control Valves. d. Place all Charging Pumps in "PULL TO LOCK". Expected Action: RO closes Seal Injection FCVs and places all Charging Pumps in PTL.

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	RO	<p>NOTE</p> <p>RCP controlled bleedoff will lower pressurizer level approximately 10% in 55 minutes. This assumes three gpm bleedoff flow from each RCP.</p>
	RO	<p>Instruction 6</p> <p>IF ALL of the following conditions are met:</p> <ul style="list-style-type: none"> • Charging has been stopped • Pressurizer level is less than 53% • Raising Pressurizer level is desired <p>THEN perform the following:</p> <ol style="list-style-type: none"> a. Open CHN-PDV-240, Charging Line to Reactor Coolant Loop 2A Differential Pressure Control Valve. b. Start at least one Charging Pump. c. Adjust CHN-PDIC-240 to 90-135 psid and place in "AUTO". d. Operate charging as needed to maintain pressurizer level between 33 and 53%. <p>Expected Action: May be performed later.</p>
	RO	<p>Instruction 7</p> <p>IF BOTH of the following conditions are met:</p> <ul style="list-style-type: none"> • Charging has been stopped • Seal injection is needed... <p>Expected Action: N/A. Seal injection is <i>not</i> needed at this time.</p>

Op-Test No.: **2015 NRC** Scenario No.: **2** Event No.: **4**Event Description: **Loss of Nuclear Cooling – Leak in Common Discharge Header**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 8</p> <p>IF VCT level needs to be lowered, THEN direct an operator to perform the following:</p> <ul style="list-style-type: none">a. Open CHN-V117, VCT drain to the EDT (Blending Room, 120' of the Auxiliary Bldg.).b. WHEN the desired level is reached, THEN close CHN-V117. <p>Expected Action: N/A. VCT level does not need to be lowered.</p>
Examiner Note: Once a Normal Chiller has been started, OR at the discretion of the Lead Examiner, may proceed to the next event.		

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train "A" BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump "B" Fails to Start**

Time	Position	Applicant's Actions or Behavior
T=55	CREW	<p>Alarms are received and acknowledged. Operators are alerted by the following:</p> <ul style="list-style-type: none"> Annunciators: <ul style="list-style-type: none"> 6A06A (FWCS PROCESS TRBL) 7B03A (CNTMT SUMPS TRBL) 7B03B (CNTMT SUMPS EXCESS LEAKAGE) Containment pressure and temperature rising Automatic initiation of SIAS, MSIS, CIAS and CSAS <p>Shortly thereafter, various other alarms on B04, B05, and B06 are received and acknowledged. Alarm response procedures 40AL-9RK6A and 40AL-9RK7B may be referenced for operator response. Operators will have little time to implement the alarm response between receipt of the first alarm and an automatic Reactor trip.</p>

40EP-9EO01, Standard Post Trip Actions

	CRS	<p>Instruction 1</p> <p>Open the Placekeeper and enter the EOP Entry Time.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 2</p> <p>Determine that Reactivity Control acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that reactor power is dropping Check that start-up rate is negative Check that ALL full strength CEAs are inserted <p>Expected Action: As directed.</p>

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train "A" BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump "B" Fails to Start**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Instruction 3</p> <p>Determine that Maintenance of Vital Auxiliaries acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that the Main Turbine is tripped Check that the Main Generator output breakers are open Check that station loads have transferred to offsite electrical power such that BOTH of the following conditions are met: <ul style="list-style-type: none"> All vital and non-vital AC buses are powered All vital and non vital DC buses are powered <p>Expected Action: RO reports all vital and non-vital AC & DC buses are powered from off-site. RO also reports that the DGs are running unloaded with Spray pond support. BOP reports Main Turbine has tripped and Main Generator output breakers are open.</p>
	CRS	<p>Instruction 4</p> <p>Determine that RCS Inventory Control acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that pressurizer level meets BOTH of the following: <ul style="list-style-type: none"> 10-65% Trending as expected to 33-53% Check that the RCS is 24°F or more subcooled Check that BOTH of the following are in service to all RCPs <ul style="list-style-type: none"> Seal injection Nuclear Cooling Water <p>Expected Action: RO reports PZR level is trending to 33-53% and subcooling is greater than 24 °F. RO secures all RCPs (due to loss of NC, when EW cross-connect valve shuts on SIAS; and loss of seal injection, when all Charging Pumps are secured for extended loss of letdown.</p>

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train “A” BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump “B” Fails to Start**

Time	Position	Applicant's Actions or Behavior
	CRS/RO	<p>Instruction 5</p> <p>Determine that RCS Pressure Control acceptance criteria are met by BOTH of the following:</p> <ul style="list-style-type: none"> • Pressurizer pressure is 1837-2285 psia • Pressurizer pressure is trending as expected to 2225-2275 psia <p>Expected Action: RO observes that Pressurizer pressure is trending to 2225-2275 psia. RO may start a Charging Pump and initiate Auxiliary Spray, if required to reduce RCS pressure.</p>
	RO	<p>Instruction 6</p> <p>Determine that Core Heat Removal acceptance criteria are met by ALL of the following:</p> <ul style="list-style-type: none"> • At least one RCP is operating • Loop ΔT is less than 10°F • RCS is 24°F or more subcooled <p>Expected Action: RCPs may, or not be, operating at this time. If operating, RO secures all RCPs. RO reports ΔT is greater than 10°F, and that subcooling is less than 24°F.</p>

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train "A" BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump "B" Fails to Start**

Time	Position	Applicant's Actions or Behavior
	CRS/BOP	<p>Instruction 7</p> <p>Determine that RCS Heat Removal acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that at least one Steam Generator meets BOTH of the following conditions: <ul style="list-style-type: none"> Level is 35% WR or more Feedwater is restoring or maintaining level 45-60% NR Check that T_C is 560-570°F Check that steam generator pressure is 1140-1200 psia <p>Expected Action: BOP reports that SG #2 is being fed by AFB or AFN. SG #1 level and pressure are lowering due to the break. ADVs on SG #2 are being used to control SG pressure.</p>
	CREW	<p>Instruction 8</p> <p>Determine that Containment Isolation acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that Containment pressure is <2.5 psig REFER TO Appendix 7, List of EOP Radiation Monitors and check BOTH of the following conditions: <ul style="list-style-type: none"> No valid containment area radiation monitor alarms or unexplained rise in activity No valid steam plant activity monitor alarms or unexplained rise in activity <p>Expected Action: RO/BOP reports that Containment pressure is <i>greater than</i> 2.5 psig. BOP reports no indication of activity in Containment or the secondary plant.</p>

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train “A” BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump “B” Fails to Start**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Contingency Action 8.a.1</p> <p>IF containment pressure is 3 psig or more, THEN ensure that CIAS has been initiated.</p> <p>Expected Action: RO ensures that CIAS has been initiated by observing red annunciator RKN-UA-2A 02A (CIAS) and CIAS Initiation relay lights OUT on B05.</p>
	CREW	<p>Instruction 9</p> <p>Determine that Containment Temperature, Pressure, and Combustible Gas Control acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that containment temperature is <117°F Check that containment pressure is <2.5 psig <p>Expected Action: RO reports that Containment temperature is greater than 117 °F and that Containment pressure is greater than 2.5 psig.</p>
	CRS	<p>Contingency Action 9.a.1</p> <p>IF containment temperature is 117°F or more, AND a SIAS has NOT actuated, THEN ensure that ALL of the available systems are in operation:</p> <ul style="list-style-type: none"> Containment Normal ACUs CEDM ACUs Reactor Cavity Fans PZR Cooling Fans <p>Expected Action: N/A. SIAS <i>has</i> actuated.</p>

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train "A" BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump "B" Fails to Start**

Time	Position	Applicant's Actions or Behavior
	CRS/RO	<p>Contingency Action 9.b.1</p> <p>IF containment pressure is 3 psig or more, THEN ensure that CIAS has been initiated.</p> <p>Expected Action: RO ensures that CIAS has been initiated by observing red annunciator RKN-UA-2A 02A (CIAS).</p>
	RO	<p>Contingency Action 9.b.2</p> <p>IF containment pressure is 8.5 psig or more, THEN perform the following:</p> <ol style="list-style-type: none"> 1) Ensure CSAS is actuated. 2) Ensure at least one Containment Spray header flow is greater than 4350 gpm. 3) Stop all of the operating RCPs. 4) Ensure RCP controlled bleedoff flow is isolated. <p>Expected Action: RO ensures CSAS is actuated by observing the red annunciator RKN-UA-2A 04A, CSAS. RO verifies CS header flow on SIA-FI-338 and SIB-FI-348. RO isolates RCP controlled bleedoff flow by shutting individual RCP bleedoff valves or by closing the either of the common bleedoff isolation valves (UV-505 or UV-506). RO also closes HV-507, RCP CONT BLEED-OFF HDR RELIEF VLV ISOL.</p> <p>Train "A" BOP ESFAS Sequencer fails to actuate and CSB-P01, CS Pump "B," trips after start.</p> <p>RO observes that the Train "A" BOP ESFAS Sequencer has failed and that CS Pump "B" has tripped. Manually starts CS Pump "A."</p>
Event 6		
Critical Task: Start CS Pump "A" prior to exiting the SPTAs.		SAT / UNSAT

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train "A" BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump "B" Fails to Start**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 10</p> <p>IF all acceptance criteria are met, AND no contingency actions were performed, THEN GO TO 40EP-9EO02, Reactor Trip.</p> <p>Expected Action: CRS determines that several contingency actions were taken.</p>
	CRS	<p>Instruction 11.</p> <p>IF any acceptance criteria are NOT met, OR ANY contingency action was taken, THEN GO TO Section 4.0, Diagnostic Actions to diagnose the event.</p> <p>Expected Action: CRS Determines that that there is anESD in progress and then transitions to40EP-9EO05, Excess Steam Demand.</p>

40EP-9EO05, Excess Steam Demand

	CRS	<p>NOTE</p> <p>Harsh conditions are containment temperature greater than 170°F or containment radiation level greater than 108 mR/hr. Harsh containment values are placed in brackets next to the normal setpoint or band.</p>
	CRS	<p>Instruction 1</p> <p>Confirm the diagnosis of an Excess Steam Demand by performing the following:</p> <ol style="list-style-type: none"> Check that the Safety Function Status Check acceptance criteria are satisfied. Ensure that the Steam Generator Sample Valves are open. Direct Chemistry to PERFORM 74DP-9ZZ05, Abnormal Occurrence Checklist. <p>Expected Action: CRS directs STA to perform Safety Function Status Check. BOP opens 12 sample valves on B07. Chemistry informed.</p>

Op-Test No.: **2015 NRC**Scenario No.: **2**Event No.: **5 & 6 & 7**

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train “A” BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump “B” Fails to Start**

Time	Position	Applicant's Actions or Behavior
	CRS	Instruction 2 Ensure the event is being classified. Expected Action: As directed.
	CRS	Instruction 3 Open the Placekeeper and enter the EOP Entry Time. Expected Action: As directed.
	BOP	Instruction 4 IF pressurizer pressure drops to the SIAS setpoint, THEN check that SIAS is actuated. Expected Action: BOP ensures that SIAS has been initiated by observing red annunciator RKN-UA-2A 01A (SIAS).

Op-Test No.: **2015 NRC**

Scenario No.: **2**Event No.: **5 & 6 & 7**

Event Description: Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train “A” BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump “B” Fails to Start

Time	Position	Applicant's Actions or Behavior
	<p>RO</p> <p>Event 6</p>	<p>Instruction 5</p> <p>IF SIAS has actuated, THEN perform the following:</p> <ol style="list-style-type: none"> Check that the HPSI and LPSI Pumps have started. Check that safety injection flow is adequate. REFER TO Appendix 2, Figures. <p>Expected Action: RO observes that the Train "A" BOP ESFAS Sequencer has failed. Notes the following equipment is affected:</p> <ul style="list-style-type: none"> HPSI Pump "A" LPSI Pump "A" Essential Cooling Water Pump "A" Spray Pond Pump "A" Control Room Essential AHU Fuel Building Essential AHU Battery Chargers and Voltage Regulators DG Building Essential Exhaust Fan "A" Essential Chiller "A" CEDM Normal AHUs Charging Pumps Permissive Actuation Relay Containment Spray Pump "A" <p>Starts equipment manually at the direction of the CRS. RO checks that SI flow meets minimum requirements for two pumps on Appendix 2.</p>

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train "A" BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump "B" Fails to Start**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 6</p> <p>IF SIAS has actuated, THEN perform the following</p> <ol style="list-style-type: none"> IF RWT level is above 73%, AND it is desired to align Charging Pump suction through CHE-HV-536 or CHN-UV-514, THEN PERFORM Appendix 103, RCS Makeup / Emergency Boration. IF it is determined that RWT level may lower to less than 73% during the event, OR it is desired to align Charging Pump suction through an alternate suction path, THEN PERFORM ONE of the following: <ul style="list-style-type: none"> Appendix 10, Charging Pump Alternate Suction to the RWT / Restoration Appendix 11, Charging Pump Alternate Suction to the SFP / Restoration <p>Expected Action: CRS may defer this action.</p>
	BOP	<p>Instruction 7</p> <p>Ensure that MSIS is actuated.</p> <p>Expected Action: BOP ensures that MSIS has been initiated by observing red annunciator RKN-UA-2A 03A (MSIS).</p>
	CRS	<p>Instruction 8</p> <p>IF pressurizer pressure remains below the SIAS setpoint, THEN perform the following:</p> <ol style="list-style-type: none"> Ensure ONE RCP is stopped in each loop. IF RCS subcooling is less than 24°F, THEN ensure all RCPs are stopped. <p>Expected Action: N/A. Pressurizer pressure remains above 1837 psia.</p>

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train "A" BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump "B" Fails to Start**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 9</p> <p>IF ANY RCPs are operating, THEN PERFORM Appendix 16, RCP Trip Criteria and check the RCP operating limits satisfied.</p> <p>Expected Action: N/A. RCPs are secured.</p>
	CREW	<p>Instruction 10</p> <p>Determine the most affected Steam Generator by considering ALL of the following:</p> <ul style="list-style-type: none"> • High steam flow from Steam Generator • Steam generator pressures • Steam generator levels • RCS cold leg temperatures <p>Expected Action: CREW determines SG #1 is the most affected SG.</p>
	CRS	<p>Instruction 11</p> <p>IF the break is NOT isolated, THEN isolate the most affected Steam Generator by performing ONE of the following:</p> <ul style="list-style-type: none"> • Appendix 113, Steam Generator 1 Isolation • Appendix 114, Steam Generator 2 Isolation <p>Expected Action: CRS directs BOP to perform Appendix 113. See Page 62.</p>

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train “A” BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump “B” Fails to Start**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 12</p> <p>Check that the most affected Steam Generator is isolated using ALL of the following:</p> <ul style="list-style-type: none"> • Steam generator pressures • Steam generator levels • RCS cold leg temperatures <p>Expected Action: After Appendix 113 is performed, BOP checks parameters and determines SG #1 is isolated.</p>
	BOP	<p>Instruction 13</p> <p>IF BOTH of the following conditions exist:</p> <ul style="list-style-type: none"> • MSIS has actuated • Condenser Reheat Tray level is in the indicating range locally (CDN-LG-88 & 89) THEN override and open the Steam Trap Isolation Valve on the unaffected Steam Generator: <ul style="list-style-type: none"> • SGA-HS-1133, Steam Trap SGNM23 Inlet Isolation Valve UV-1133 • SGA-HS-1134, Steam Trap SGNM24 Inlet Isolation Valve UV-1134 <p>Expected Action: BOP closes UV-1133&UV-1134.</p>

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Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train "A" BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump "B" Fails to Start**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 14</p> <p>Stabilize RCS temperature using the lowest Tc by performing the following:</p> <ol style="list-style-type: none"> Maintain Tc within the P/T limits. REFER TO Appendix 2, Figures Steam the least affected Steam Generator using ANY of the following: <ul style="list-style-type: none"> SBCS to the condenser ADV from the Control Room Appendix 116, Operation of SBCS Valves 1007 and 1008 Appendix 18, Local ADV Operation Control feedwater to the least affected steam generator. WHEN control is regained, THEN record the following: <p>Time: _____</p> <p>RCS Tc: _____</p> <p>PZR Pressure: _____</p> IF the P/T limits were exceeded, REFER TO Appendix 2, Figures AND no RCPs are running, THEN maintain current temperature and pressure for at least 2 hours. <p>AFB-P01, AF Pump "B," fails to automatically start.</p> <p>Expected Action: BOP should observe that AFB is not running and manually start the pump. BOP may also start Auxiliary Feedwater Pump "N."</p>
		<p>Event 7</p>
<p>CRITICAL TASK: Start Auxiliary Feedwater Pump "B" or "N" establish feed to the unaffected SG prior to opening the primary safeties.</p>		<p>SAT / UNSAT</p>

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Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train "A" BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump "B" Fails to Start**

Time	Position	Applicant's Actions or Behavior	
CRITICAL TASK: Control primary and secondary systems to prevent lifting the primary safeties.			SAT / UNSAT
	CRS	Instruction 15 IF steaming to atmosphere, THEN inform Radiation Protection and the RMS Technician. Expected Action: As directed.	
	CRS	CAUTION Throttling HPSI injection valves will cause erosion damage to downstream piping.	
	RO	Instruction 16 IF at least one HPSI Pump is operating, AND ALL of the following conditions exist: <ul style="list-style-type: none"> • RCS is 24°F [44°F] or more subcooled • Pressurizer level is greater than 10% [15%] and NOT lowering • The unisolated Steam Generator is available for RCS heat removal with level being maintained within or being restored to 45 - 60% [45 - 60%] NR • RVLMS indicates RVUH level is 16% or more THEN throttle HPSI flow or stop the HPSI Pumps one pump at a time. THEN throttle HPSI flow or stop the HPSI Pumps one pump at a time. Expected Action: RO may throttle HPSI flow from HPSI Pump A.	

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Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train “A” BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump “B” Fails to Start**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 17</p> <p>IF any of the Safety Injection throttle criteria can NOT be maintained, THEN perform the following:</p> <ul style="list-style-type: none"> a. Raise HPSI flow. b. Start HPSI pumps as needed. <p>Expected Action: N/A. Flow from HPSI Pump A is sufficient to maintain throttle criteria.</p>
	RO	<p>Instruction 18</p> <p>IF pressurizer pressure is greater than 220 psia [220 psia], AND is being controlled, THEN perform the following:</p> <ul style="list-style-type: none"> a. Stop the LPSI Pumps. b. Close the LPSI Injection Valves. <p>Expected Action: RO stops LPSI pumps.</p>
	CRS	<p>Instruction 19</p> <p>IF pressurizer pressure can NOT be maintained above 220 psia [220 psia], AND the LPSI Pump(s) have been stopped, THEN perform the following:</p> <ul style="list-style-type: none"> a. Start available LPSI Pumps. b. Open LPSI Injection Valves. <p>Expected Action: N/A. Pressurizer pressure can be maintained above 220 psia.</p>

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Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train "A" BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump "B" Fails to Start**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 20</p> <p>Maintain the unaffected steam generator level 45 - 60% [45 - 60%] NR.</p> <p>Expected Action: BOP uses AFB or AFN to maintain SG levels.</p>

Appendix 113, Steam Generator 1 Isolation

	BOP	<p>Instruction 1</p> <p>Close BOTH ADVs on Steam Generator 1:</p> <ul style="list-style-type: none"> • SGA-HV-184 • SGB-HV-178 <p>Expected Action: BOP closes SGA-HV-184 & SGB-HV-178.</p>
	BOP	<p>Instruction 2</p> <p>Close BOTH MSIVs on Steam Generator 1:</p> <ul style="list-style-type: none"> • SGE-UV-170 • SGE-UV-180 <p>Expected Action: BOP closes SGE-UV-170 & SGE-UV-180.</p>
	BOP	<p>Instruction 3</p> <p>Ensure SGE-UV-169, SG 1 MSIV Bypass Valve, is closed.</p> <p>Expected Action: BOP checks SGE-UV-169 closed.</p>

Op-Test No.: 2015 NRC

Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train “A” BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump “B” Fails to Start**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 4</p> <p>Close BOTH SG 1 Economizer FWIVs:</p> <ul style="list-style-type: none"> • SGA-UV-174 • SGB-UV-132 <p>Expected Action: BOP closes SGA-UV-174 & SGB-UV-132.</p>
	BOP	<p>Instruction 5</p> <p>Close BOTH SG 1 Downcomer Isolation Valves:</p> <ul style="list-style-type: none"> • SGA-UV-172 • SGB-UV-130 <p>Expected Action: BOP closes SGA-UV-172 & SGB-UV-130.</p>
	BOP	<p>Instruction 6</p> <p>Close BOTH SG 1 Blowdown Containment Isolation Valves:</p> <ul style="list-style-type: none"> • SGA-UV-500P • SGB-UV-500Q <p>Expected Action: N/A. Valves already closed in Event 1.</p>
	BOP	<p>Instruction 7</p> <p>Close BOTH of the following steam trap isolation valves:</p> <ul style="list-style-type: none"> • SGA-UV-1133, Steam Trap M23 Isolation • SGB-UV-1135A/1135B, Steam Trap M01/M02 Isolations <p>Expected Action: BOP closes SGA-UV-1133&SGB-UV-1135A/1135B.</p>
	BOP	<p>Instruction 8</p> <p>Check that the Steam Generator Safety Valves are closed.</p> <p>Expected Action: BOP observes no red lights on the 4 sets of indicators on the MAIN STEAM RELIF VLVS section of B06.</p>

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Scenario No.: 2

Event No.: 5 & 6 & 7

Event Description: **Feedwater Line Break Inside Containment (Economizer)(Trip Initiator), Train “A” BOP ESFAS Sequencer Fails, and Auxiliary Feedwater Pump “B” Fails to Start**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 9</p> <p>Ensure BOTH Aux Feed Pump A Steam Supply Valves are closed:</p> <ul style="list-style-type: none"> • SGA-UV-134 SG 1 Steam Supply to Aux Feed Pump A • SGA-UV-134A SG1 Steam Supply to Aux Feed Pump A Bypass <p>Expected Action: BOP checks SGA-UV-134&SGA-UV-134A closed.</p>
	BOP	<p>Instruction 10</p> <p>Ensure BOTH Auxiliary Feedwater Isolation Valves are closed:</p> <ul style="list-style-type: none"> • AFB-UV-34 Aux Feedwater to SG1 Downstream Valve • AFC-UV-36 Aux Feedwater to SG1 Downstream Valve <p>Expected Action: BOP checks AFB-UV-34&AFC-UV-36 closed.</p>

Examiner NOTE: Scenario may be terminated when SG #2 level is trending toward 45-60% NR, at the discretion of the Lead Examiner.

Facility: <u>PVNGS</u>	Scenario No.: <u>3 (Rev. 4)</u>	Op-Test No.: <u>NRC - 2015</u>
Examiners: _____ _____ _____		Operators: _____ _____ _____
Initial Conditions: (100% power, MOC). Turnover: See attached.		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N BOP/SRO	Place Reactor Power Cutback System in service in accordance with 40OP-9SF04, Operation of the Reactor Power Cutback System, Sections 6.1.1 and 6.1.2.
2	mfTH07	C RO/SRO (AOP/TS)	<p>A small RCS Leak (approximately 4 gpm) develops. The crew initially responds using 74RM-9EF41, Radiation Monitoring System Alarm Response, for the RU-1 alarm. Operator Response 4 directs the crew to perform an RCS water inventory balance per 40ST-9RC02, ERFDADS (Preferred) Calculation of RCS Water Inventory.</p> <p>[LCO 3.4.14, Condition A]</p>
3	mfCH01A mfCH01C cmCPCH03HCNA02B_5 cmCPCH03HCNA02D_5	C BOP/SRO (AOP)	CEDM Fans "A" and "C" Trip, standby fans (HCN-A02B and A02D) fail to automatically start. The BOP refers to 40AL-9RK7A for window 7A09B. CRS implements 40AO-9ZZ20, Loss of HVAC, Section 10.0, Loss of Containment Building HVAC – CEDM.
4	mfRC03A	C RO/SRO	RCP 1A Thrust Bearing oil leak. RO refers to the Alarm Response Procedure 40AL-9RJ01 for point RCL107 (Low), RCP 1A BRG OIL RESVR LEV. The ARP directs filling the RCP thrust bearing reservoir per 40OP-9RC01, Reactor Coolant Pump Operation. The operator uses Section 6.14 of 40OP-9RC01 to raise reservoir level. Operator Action 2.5 of the ARP prompts evaluation of 40AO-9ZZ04, Reactor Coolant Pump Emergencies, and the CRS may implement Section 3.0, Abnormal RCP Motor or Bearing Parameters.
5	doED_ZLS037271DS_W1 doRP_ZLSAAC02ALOP1_W1 mfAN_1A03D1	C BOP/SRO (TS)	<p>The UV-1 LOV relay for PBA-S03 fails</p> <p>[LCO 3.3.7, Condition A]</p>
6	mfED13A	C RO/BOP/ SRO (AOP)	<p>Loss of NNN-D11. The RO refers to 40AL-9RK1C, point NNYS3 (Bkr Ovld Trip). Operator Action 2 of the ARP then directs performance of 40AO-9ZZ14, Loss of Non-Class Instrument or Control Power.</p> <p>[LCO 3.4.9, Condition A]</p>
7	mfTH08	M ALL	A Pressurizer Steam Space LOCA occurs
8	See scenario file	C BOP/SRO	ATWS occurs, requiring pressing Rx Trip pushbuttons. Crew implements 40EP-9EO01, Standard Post Trip Actions. When the SPTAs are complete, the CRS diagnosis a LOCA, then transitions

Facility: <u>PVNGS</u>	Scenario No.: <u>3 (Rev. 4)</u>	Op-Test No: <u>NRC - 2015</u>
Examiners: _____ _____	Operators: _____ _____	
Initial Conditions: (100% power, MOC). Turnover: See attached.		

Event No.	Malf. No.	Event Type*	Event Description
			to 40EP-9EO03, Loss of Coolant Accident. (CRITICAL TASK: Trip the Reactor prior to exiting Step 2 of SPTAs.)
9	cmCPSI01SIAP02_6 cmCPSI01SIBP02_5	C RO/SRO	HPSI Pump "A" trips and HPSI Pump "B" fails to automatically start. (CRITICAL TASK: Manually start HPSI Pump "B" prior to exiting SPTAs.)
End point	N/A	ALL	The scenario may be terminated once the RCS cooldown has been initiated, at the discretion of the Chief Examiner.

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	8
2. Malfunctions after EOP entry (1-2)	2
3. Abnormal events (2-4)	3
4. Major transients (1-2)	1
5. EOPs entered/requiring substantive actions (1-2)	1
6. EOP contingencies requiring substantive actions (0-2)	0
7. Critical tasks (2-3)	2

CRITICAL TASK	JUSTIFICATION	REFERENCES
Trip the Reactor prior to exiting Step 2 of SPTAs.	<p>Failure to ensure that the Reactivity Control Safety Function is met will result in excess heat input into the RCS and overheating of the nuclear fuel (degradation of a fission product barrier). 40DP-9AP06, Standard Post Trip Actions Technical Guidelines, explain that, to ensure the Reactor is shutdown, operators must take Contingency Actions if the Reactor is not automatically shut down by the Plant Protection System.</p>	<ul style="list-style-type: none"> • PVNGS SPTA-2, When a reactor trip setpoint is exceeded, ensure the SPTA Reactivity Control contingency actions are taken prior to the completion of the SPTAs. • CE SPTA-01, Establish Reactivity Control.
Manually start HPSI Pump “B” prior to exiting SPTAs.	<p>Inadequate Safety Injection flow may result in loss of subcooled margin and/or core uncover. Additionally, failure to establish SI flow may lead to an inappropriate transition to the Functional Recovery Procedure, which would complicate mitigation strategies. Failure to start HPSI will delay the point where SI throttle criteria are met. and could result in extended operation of the LPSI pumps without adequate flow through the pump, which could, in turn, result in LPSI pump damage (degraded ECCS).</p> <p>40DP-9AP06, Standard Post TripActions Technical Guidelines, Instruction Step: 5 RCS Pressure Control, Contingency Action 5.2, states: “Pressurizer pressure dropping to the SIAS setpoint may be an indication of a primary system break. If SIAS does not initiate automatically, the operator should manually initiate SIAS. If SIAS has actuated, or is required to be actuated, then the operator is required to ensure that the proper equipment is in operation. In doing so, the operator should ensure that the SI pumps are running and that the injection valves are open.”</p> <p>40DP-9AP08, Loss of Coolant Accident Technical Guideline, Instruction Step:32 LPSI stop criteria, states: “The intent of this step is to prevent damaging the LPSI Pumps as a result of extendedoperation without adequate flow through the pump.” To secure the LPSI pumps, RCS pressure must be under control of the operator. Without HPSI pumps, coolant loss out of the break will exceed makeup capacity and RCS pressure will drop, delaying the point where LPSI pumps can be secured.</p> <p>40DP-9AP08, Instruction Step: 5 Ensure adequate SI flow, states: “This step ensures that Safety Injection flow is within the limits of the design basis.”</p>	<ul style="list-style-type: none"> • PVNGS SPTA-1, When the Safety Injection Actuation setpoint is exceeded; ensure adequate Safety Injection to meet Safety Function prior to the completion of the SPTAs. • CE SPTA-05, Establish RCS Pressure Control. • 40DP-9AP06, Standard Post TripActions Technical Guidelines, Instruction Step: 5 • 40DP-9AP08, Loss of Coolant Accident Technical Guideline, Instruction Step: 5 • 40DP-9AP08, Loss of Coolant Accident Technical Guideline, Instruction Step:32

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Event 1

The BOP operator places the Reactor Power Cutback System (RPCS) in service in accordance with 40OP-9SF04, Operation of the Reactor Power Cutback System, Sections 6.1.1 and 6.1.2. This BOP, normal evolution involves testing the cutback circuits at the RPCS module and selecting the appropriate subgroups. After the subgroups have been selected for LOSS OF FEED PUMP, or at the discretion of the Lead Examiner, the next event can be initiated.

Event 2

A small RCS Leak (approximately 4 gpm) develops. The crew is alerted by the following:

- Alarm on RU-1, Containment Atmosphere
- Rising Containment Sump levels on BO7, RDN LI-410, RDN LI-10
- Rising Containment Sump levels on BO7, Yokogawa recorder RMN-TRJ-1, Points 17, 18, 18, and 20

The crew initially responds using 74RM-9EF41, Radiation Monitoring System Alarm Response, for the RU-1 alarm. RP and the Radiological Monitoring Technician are informed. Operator Response 4 directs the crew to perform an RCS water inventory balance per 40ST-9RC02, ERFDADS (Preferred) Calculation of RCS Water Inventory.

When rising Containment sump levels and/or temperatures are observed, the CRS implements 40AO-9ZZ02, Excessive RCS Leakrate, Section 3.0, RCS Leakage. For this small leakage, Pressurizer level is relatively stable and letdown remains in service with the existing Charging Pump configuration. LCO 3.4.14, RCS Operational Leakage, is evaluated. Chemistry and RP are informed. The leakrate is quantified, most likely using Appendix B, ERFDADS Leak Rate Determination. This appendix directs the RO to secure Reactor Makeup and setup ERFDADS to run the calculation by selecting "RCS LEAK RATE" on the SPDS Overview screen and selecting "TREND-1" on the Analog Point Attributes screen. The trend is run for at least 15 minutes or until VCT level lowers to 15%. Once the leak rate has been determined, VCT makeup is restored.

Since the leak is UNIDENTIFIED leakage and the calculated leak rate is approximately 4 gpm, the CRS enters LCO 3.4.14, Condition A. Once the CRS has determined that LCO 3.4.14, Condition A, must be entered, OR at the discretion of the Lead Examiner, the next event may be initiated.

Event 3

CEDM Fans "A" and "C" trip and the standby fans (HCN-A02B and A02D) fail to automatically start. The standby fans normally start on a low DP after a 120 second time delay. The crew is alerted by the following:

- Brighter than green lights on the previously-running fans
- Annunciator 7A09B (CEDM ACU COOL SYS TRBL), Group E
- Computer alarm point HCYS49 (CEDM ACU A Fan A(C) Elect Prot)
- SEAS/SEIS alarms (21B, CEDM NORM; 6D1, Non-ESF Load Shed)

The BOP refers to 40AL-9RK7A for window 7A09B. CRS implements 40AO-9ZZ20, Loss of HVAC, Section 10.0, Loss of Containment Building HVAC – CEDM. Since RCS temperature is greater than 300°F, the crew has 40 minutes to restore CEDM cooling or trip the Reactor. The BOP waits for approximately two minutes, then start fans "B" and "D." If they do not start the standby fans within 10 minutes; they must perform 40OP-9ZZ05, Power Operations, Section 8.0, Rapid Shutdown, to ensure the Unit is shut down

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within 40 minutes of the loss of CEDM HVAC. NOTE: Both 40AL-9RK7A and 40AO-9ZZ20 provide direction to start the standby fans.

When the standby CEDM fans are started, on Board 1, alarm 1A5D (120 VAC 1E PNL 28 INVERTER D TRBL) actuates. This is accompanied by an alarm on Computer Point ID PNYS4, 120 VAC INV D AC/DC STATUS. 40AL-9RK1A directs the RO to dispatch an AO to check indications on the inverter control panel. When dispatched, the AO reports that there is a red “LOSS OF SYNC” light on PND-N14 Inverter D. In accordance with the table under Operator Action 9, the ARP directs the AO to check the availability of the alternate supply, then depress the “SYNCHRONIZATION” button to clear the alarm

When the standby fans have been started, or at the discretion of the Lead Examiner, the next event may be initiated.

Event 4

RCP 1A Thrust Bearing oil leak, resulting in low level. RO refers to the Alarm Response Procedure 40AL-9RJ01 for point RCL107 (Low), RCP 1A BRG OIL RESVR LEV. The alarm actuates at 64%. The ARP directs the crew to validate the alarm by calling up the PMS or ERFDADS point. It then directs filling the RCP thrust bearing reservoir per 40OP-9RC01, Reactor Coolant Pump Operation. The operator uses Section 6.14 of 40OP-9RC01 to raise reservoir level. Instruction 6.14.5 directs the operator to start (and hold) RCN-P02A, RCP Lift Oil Pump P02A, to begin filling the reservoir. When ERFDADS point RCL107 indicates level is between 64% and 85% (determined by CRS), the lift pump switch is allowed to spring-return to AUTO. Operator Action 2.5 of the ARP prompts evaluation of 40AO-9ZZ04, Reactor Coolant Pump Emergencies, and the CRS may implement Section 3.0, Abnormal RCP Motor or Bearing Parameters. Section 3.0 directs the crew to monitor Upper Thrust Bearing temperature (may use lift pump to slow the rate) and restore the reservoir level per Appendix C, Restoring RCP Oil Reservoir Levels.

Once the RCP oil lift pump is returned to AUTO and the reservoir is filled per the CRS' direction, or at the discretion of the Lead Examiner, the next event may be initiated.

Examiner NOTE: To prevent repetitive alarms and fill operations, the malfunction will be deleted when the first alarm actuates.

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Event 5

The UV-1 LOV relay for PBA-S03 fails. The crew is alerted by the following:

- Annunciator 1A3D (UNDV A CH TRIP)
- On Panel B01, the white light “PHASE AB 727-1” (for the 4.16KV BUS POTENTIAL INDICATION) is extinguished)
- Computer alarm point SAYS19 (ESF BUS UNDV CH A-1)

The RO refers to 41AL-1RK1A for window 1A03D. There are NO automatic actions for one channel UV trip. The ARP directs the operator to check the 4.16KV BUS POTENTIAL INDICATION lights and the RO observes that the “PHASE AB 727-1” light is off. Operator Action 3 of the ARP provides direction for only 1UV relay failure. Once alarm validity has been checked and the relay identified, the ARP directs the operator to bypass the malfunctioned relay in accordance with 40OP-9SA01, BOP ESFAS Modules Operation. The BOP uses Section 6.8, Placing BOP ESFAS Modules in Bypass. After obtaining a key and verifying Prerequisites and Initial Conditions are met, the BOP performs a lamp test (6.8.4), selects the proper relay channel (6.8.7), and checks that the opposite Train is NOT in Bypass (6.8.10). To complete the bypass, the BOP inserts the key, turns it clockwise ¼ turn, and verifies that the Bypass light is ON (6.8.11).

When the BOP opens the BOP ESFAS Panel door, the CR will receive alarm 5A2D (BOP ESFAS IN TEST) and the alarm will clear when the door is closed. When the BOP turns the key to Bypass, the CR will receive alarm 5A3D (BOP ESFAS CH BYP), which is an expected alarm.

The CRS evaluates TSs 3.3.7, 3.8.1, and 3.8.2. LCO 3.3.7, Diesel Generator (DG) – Loss of Voltage Start (LOVS), Condition A is entered because only one LOVS channel is inoperable. Condition A requires the failed channel to be placed in bypass or trip within 1 hour. LCO 3.8.1, AC Sources – Operating, is still met because the failed relay channel does not make offsite sources, the associated DG, nor the load sequencer inoperable. LCO 3.8.1, AC Sources – Shutdown, is not applicable because the Unit is NOT in Mode 5 or 6.

Once the BOP ESFAS door keys are returned, the next event may be initiated.

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Event 6

Loss of NNN-D11. The crew is alerted by the following:

- Annunciator 1C12B (120 VCA PNL D11/D12/15/16 TRBL)
- Numerous annunciators on B03, B04, and other panels
- Loss of power to recorders for Pressurizer level and VCT level/pressure
- Numerous Computer alarm points

The RO refers to 40AL-9RK1C, point NNYS3 (Bkr Ovld Trip), which prompts the RO to direct an AO to investigate the alarm. The AO reports that there is a ground detection indicating light on the center panel of the switchgear and that the bus feeder breaker 52-D11 has tripped. Operator Action 2 of the ARP then directs performance of 40AO-9ZZ14, Loss of Non-Class Instrument or Control Power. The crew walks down the control boards to evaluate affected equipment. FIN/electrical maintenance is informed and PR&C is notified to locate the ground. 40AO-9ZZ14 directs the crew to operate ADVs to control SG pressures. The RO places the following handswitches in Channel "X:"

- RCN-HS-110, Level Control Selector Switch
- RCN-HS-100-3, Heater Control Selector Switch
- RCN-HS-100, Pressure Control Selector Switch

The BOP ensures CEDMCS is NOT selected to Auto Sequential "AS." The RO ensures that no more than one Charging Pump is running and implements 40AO-9ZZ05, Loss of Letdown. The RO initially ensures no more than 1 Charging Pumps is running. At the direction of the CRS, the RO performs Appendix C, Extended Operations Without Letdown. The RO closes the Seal Injection Flow Control Valves and places all Charging Pumps in "PULL TO LOCK."

The CRS/SM/STA evaluates the following TSs:

- LCO 3.2.1, Linear Heat Rate (LHR)
- LCO 3.2.2, Planer Radial Peaking Factors (Fxy)
- LCO 3.2.3, Azimuthal Power Tilt (Tq)
- LCO 3.2.4, Departure From Nucleate Boiling Ratio (DNBR)
- LCO 3.2.5, Axial Shape Index (ASI)

The CRS will perform 40DP-9OP05, Control Room Data Sheet Instructions, due to the loss of JSCALOR. Since JSCALOR is not available and COLSS is functioning, 40DP-9OP05, Instruction 3.3.11 directs the crew to record the current NKBDELTC values and establish that value as the current steady state maximum power.

When the RO has completed the actions in 40AO-9ZZ05, Loss of Letdown, or at the discretion of the Lead Examiner, the next event may be initiated.

Event 7 & 8

A Pressurizer Steam Space LOCA occurs. PPS fails to initiate a Reactor Trip and the BOP uses the MANUAL REACTOR TRIP pushbuttons to trip the Reactor. Crew implements 40EP-9EO01, Standard Post Trip Actions.

(CRITICAL TASK: Trip the Reactor prior to exiting Step 2 of SPTAs)

While implementing the SPTAs, the RO observes that Pressurizer level is NOT trending to 33-53% and that RCS subcooling is less than 24°F, and then secures all RCPs. The RO also observes that Pressurizer pressure is less than 1837 psia and is NOT trending to 2225-2275 psia. The RO then ensures that SIAS is actuated. At this point, the RO may note that HPSI Pump "A" has tripped and HPSI Pump "B" has failed to

2015 NRC Scenario 3 Overview

	<p>automatically start. The RO should start HPSI Pump “B” at this time.</p> <p>(CRITICAL TASK: Manually start HPSI Pump “B” prior to exiting SPTAs.)</p> <p>When the SPTAs are complete, the CRS uses the Diagnostics Actions to determine that there is a LOCA in progress and then transitions to 40EP-9EO03, Loss of Coolant Accident.</p>
<u>Event 9</u>	<p>HPSI Pump “A” trips and HPSI Pump “B” fails to automatically start. While implementing 40EP-9EO03, Loss of Coolant Accident, Instruction 5.a directs the crew to check the status of the HPSI and LPSI pumps. If not already noted in the SPTAs, the RO observes that HPSI Pump “A” has tripped and HPSI Pump “B” has failed to automatically start. If not already started, the RO shall start HPSI Pump “B” at this time.</p> <p>The crew then attempts to locate and isolate the leak, place the Hydrogen Analyzers in service, and ensure CIAS has properly actuated. The RO will ensure that at least one CS header flow is greater than 4350 gpm and isolate RCP control bleedoff flow. The Hydrogen Recombiners are placed in service. Since Containment pressure is less than 50 psig, and SI flow is within the SI delivery curves, one CS Pump is stopped. The crew directs an AO to reenergize SIAS Load Shed Panels in accordance with Appendix 21. The crew cools down the Steam generators (and RCS) using the ADVs (since SBCS is unavailable due to the loss of NNN-D11).</p>
<u>End Point</u>	<p>Scenario may be terminated upon transition to cooldown and after CRS briefs the crew, OR at the discretion of the Lead Examiner.</p>

TURNOVER

Plant Conditions:

- Unit 1 is at 100% power.
- The core is presently at 250 EFPD.
- Risk Management Action Level is ORANGE.
- AFA-P01 is out of service for unscheduled maintenance.
- AFN-P01 and AFB-P01 are protected.
- PC is NOT recircing the RWT.
- Unit 2 is supplying the Aux Steam cross-tie header.
- At the request of Chemistry, the pressurizer is in boron equalization in accordance with 40OP-9ZZ05, Power Operations.

Equipment Out of Service:

- The Reactor Power Cutback System is out of service to replace overheating components. The components have been replaced.
- AFA-P01 is under clearance for maintenance. LCO 3.7.5, Condition A and Condition B, have been entered. The pump is expected to return to service in 8 hours.

Planned Shift Activities:

- Restore the RPCB System to service in accordance with 40OP-9SF04, Operation of the Reactor Power Cutback System, Sections 6.1.1 and 6.1.2.

Op-Test No.: **2015 NRC** Scenario No.: **3 (Rev. 3)** Event No.: **1**

Event Description: **Place the Reactor Power Cutback System in Service**

Time	Position	Applicant's Actions or Behavior
T=0	CRS	Directs the BOP to place the RPCS in service in accordance with 40OP-9SF04, Operation of the Reactor Power Cutback System, Sections 6.1.1 and 6.1.2.

40OP-9SF04, Operation of the Reactor Power Cutback System, Section 6.1.1, Placing the RPCS in Service at or above 70% Power with no Subgroups Selected

	BOP	Instruction 6.1.1 Placing the RPCS in Service at or above 70% Power with no Subgroups Selected
	BOP	NOTE Appendix A - Reactor Power Cutback System Module Diagram, and Appendix B - Reactor Power Cutback System Response Matrix, are provided for information only.
	BOP	Instruction 6.1.1.1 Perform a lamp test on the RPCS module by pressing LAMP TEST. Expected Action: As directed.
	BOP	Instruction 6.1.1.2 Ensure the RPCS module lights turn ON. Expected Action: As directed.

Op-Test No.: **2015 NRC** Scenario No.: **3 (Rev. 3)** Event No.: **1**

Event Description: **Place the Reactor Power Cutback System in Service**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6.1.1.3</p> <p>Check the AUTO ACTUATE OUT OF SERVICE light is ON at the RPCS module.</p> <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.1.4</p> <p>IF the TEST/RESET light is ON, THEN perform the following:</p> <ol style="list-style-type: none">Press the TEST/RESET button.Check TEST/RESET light is OFF.IF the TEST/RESET light is ON, THEN perform an RPCS reset per Section 6.6, Troubleshooting the RPCS. <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.1.5</p> <p>Press BOTH of the following buttons:</p> <ul style="list-style-type: none">DISPLAY SUBGROUP SELECTLOSS OF FEED PUMP <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.1.6</p> <p>Ensure all SUBGROUP SELECT lights are OFF.</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3 (Rev. 3)** Event No.: **1**

Event Description: **Place the Reactor Power Cutback System in Service**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6.1.1.7</p> <p>IF ANY SUBGROUP SELECT lights are ON, THEN reset the subgroup(s) as follows:</p> <ol style="list-style-type: none">Press the TEST/RESET button.Press the TEST/RESET button again.Press BOTH of the following buttons:<ul style="list-style-type: none">DISPLAY SUBGROUP SELECTLOSS OF FEED PUMPCheck all SUBGROUP SELECT lights are OFF.IF any SUBGROUP SELECT lights remain ON, THEN consult the SM/CRS for appropriate action. <p>Expected Action: N/A. No SUBGROUP SELECT lights are ON.</p>
	BOP	<p>Instruction 6.1.1.8</p> <p>Press BOTH of the following buttons:</p> <ul style="list-style-type: none">DISPLAY SUBGROUP SELECTLOSS OF FEED PUMP <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.1.9</p> <p>Check all SUBGROUP SELECT lights are OFF.</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3 (Rev. 3)** Event No.: **1**

Event Description: **Place the Reactor Power Cutback System in Service**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6.1.1.10</p> <p>IF ANY SUBGROUP SELECT lights are ON, THEN perform the following:</p> <ul style="list-style-type: none">a. Press the TEST/RESET button.b. Press the TEST/RESET button again.c. Press BOTH of the following buttons:<ul style="list-style-type: none">• DISPLAY SUBGROUP SELECT• LARGE LOAD REJECTd. Check_all SUBGROUP SELECT lights are OFF.e. IF any SUBGROUP SELECT lights remain ON, THEN consult the SM/CRS for appropriate action. <p>Expected Action: N/A. No SUBGROUP SELECT lights are ON.</p>
	BOP	<p style="text-align: center;">NOTE</p> <p>There will be a slight delay before the AUTO ACTUATE OUT OF SERVICE light turns OFF.</p>
	BOP	<p>Instruction 6.1.1.11</p> <p>Press the AUTO ACTUATE OUT OF SERVICE button.</p> <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.1.12</p> <p>Check AUTO ACTUATE OUT OF SERVICE light is OFF.</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3 (Rev. 3)** Event No.: **1**

Event Description: **Place the Reactor Power Cutback System in Service**

Time	Position	Applicant's Actions or Behavior
	BOP	Instruction 6.1.1.13 Press BOTH of the following buttons: <ul style="list-style-type: none">• DISPLAY SUBGROUP SELECT• LOSS OF FEED PUMP Expected Action: As directed.
	BOP	Instruction 6.1.1.14 Check all SUBGROUP SELECT lights are OFF. Expected Action: As directed.
	BOP	Instruction 6.1.1.15 Press BOTH of the following buttons: <ul style="list-style-type: none">• DISPLAY SUBGROUP SELECT• LARGE LOAD REJECT Expected Action: As directed.
	BOP	Instruction 6.1.1.16 Check all SUBGROUP SELECT lights are OFF. Expected Action: As directed.

Op-Test No.: **2015 NRC** Scenario No.: **3 (Rev. 3)** Event No.: **1**

Event Description: **Place the Reactor Power Cutback System in Service**

Time	Position	Applicant's Actions or Behavior
40OP-9SF04, Operation of the Reactor Power Cutback System, Section 6.1.2, Selecting Subgroups at or above 74% power		
	BOP	<p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> Appendix A - Reactor Power Cutback System Module Diagram, and Appendix B - Reactor Power Cutback System Response Matrix, are provided for information only. This section is performed when the Reactor power is greater than or equal to 74% and the RPCS is in service per Section 6.1.1, Placing the RPCS in Service at or above 70% Power with no Subgroups Selected. The RPCS may be left in Manual Select or Auto Actuate Mode.
	BOP	<p>Instruction 6.1.2.1</p> <p>Perform a lamp test on the RPCS module by pressing LAMP TEST.</p> <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.2.2</p> <p>Ensure the RPCS module lights turn ON.</p> <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.2.3</p> <p>Enter Subgroups 4, 5 and 22 for Large Load Reject as follows:</p> <ol style="list-style-type: none"> Press the ENTER MANUAL SUBGROUP SELECT button. Check the ENTER MANUAL SUBGROUP SELECT button light is ON. <p>Expected Action: As directed.</p>
	BOP	<p style="text-align: center;">NOTE</p> <p>When subgroup 5 is pressed both Subgroups 5 and 22 lights should turn ON.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3 (Rev. 3)** Event No.: **1**

Event Description: **Place the Reactor Power Cutback System in Service**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6.1.2.3 (continued)</p> <p>c. Press ALL of the following SUBGROUP SELECT buttons:</p> <ul style="list-style-type: none">• Subgroup 4• Subgroup 5• Subgroup 22 <p>d. Check ALL of the following SUBGROUP SELECT lights are ON:</p> <ul style="list-style-type: none">• Subgroup 4• Subgroup 5• Subgroup 22 <p>Expected Action: As directed.</p>
Examiner Note: It is possible that an internal circuit may “time out” during this process and not allow the operator to select subgroups. If this occurs, the operator should simply start the process over.		
	BOP	<p>Instruction 6.1.2.3 (continued)</p> <p>e. Press the LARGE LOAD REJECT button.</p> <p>f. Check LARGE LOAD REJECT light is ON.</p> <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.2.3 (continued)</p> <p>f. Check that after 15 to 20 seconds ALL of the following lights are OFF:</p> <ul style="list-style-type: none">• Subgroup 4• Subgroup 5• Subgroup 22• LARGE LOAD REJECT <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3 (Rev. 3)** Event No.: **1**

Event Description: **Place the Reactor Power Cutback System in Service**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6.1.2.3 (continued)</p> <p>g. Press BOTH of the following buttons:</p> <ul style="list-style-type: none">• DISPLAY SUBGROUP SELECT• LARGE LOAD REJECT <p>h. Check ALL of the following SUBGROUP SELECT lights are ON:</p> <ul style="list-style-type: none">• Subgroup 4• Subgroup 5• Subgroup 22 <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.2.3 (continued)</p> <p>i. Check after 15 to 20 seconds ALL of the following lights are OFF:</p> <ul style="list-style-type: none">• Subgroup 4• Subgroup 5• Subgroup 22• LARGE LOAD REJECT <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.2.4</p> <p>Enter Subgroups 4, 5 and 22 for LOSS OF FEED PUMP as follows:</p> <p>a. Press the ENTER MANUAL SUBGROUP SELECT button.</p> <p>b. Check the ENTER MANUAL SUBGROUP SELECT light is ON.</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3 (Rev. 3)** Event No.: **1**

Event Description: **Place the Reactor Power Cutback System in Service**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6.1.2.4 (continued)</p> <p style="text-align: center;">NOTE</p> <p>When subgroup 5 is pressed both Subgroups 5 and 22 lights should turn ON.</p> <p>c. Press ALL of the following SUBGROUP SELECT buttons:</p> <ul style="list-style-type: none">• Subgroup 4• Subgroup 5• Subgroup 22 <p>d. Check ALL of the following SUBGROUP SELECT lights are ON:</p> <ul style="list-style-type: none">• Subgroup 4• Subgroup 5• Subgroup 22 <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.2.4 (continued)</p> <p>e. Press the LOSS OF FEED PUMP button.</p> <p>f. Check LOSS OF FEED PUMP light is ON.</p> <p>Expected Action: As directed.</p>
	BOP	<p>Instruction 6.1.2.4 (continued)</p> <p>g. Check that after 15 to 20 seconds ALL of the following lights are OFF:</p> <ul style="list-style-type: none">• Subgroup 4• Subgroup 5• Subgroup 22• LOSS OF FEED PUMP <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3 (Rev. 3)** Event No.: **1**

Event Description: **Place the Reactor Power Cutback System in Service**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6.1.2.4 (continued)</p> <p>h. Press BOTH of the following buttons:</p> <ul style="list-style-type: none">• DISPLAY SUBGROUP SELECT• LOSS OF FEED PUMP <p>i. Check ALL of the following SUBGROUP SELECT lights are ON:</p> <ul style="list-style-type: none">• Subgroup 4• Subgroup 5• Subgroup 22 <p>Expected Action: As directed</p>
	BOP	<p>Instruction 6.1.2.4 (continued)</p> <p>j. Check that after 15 to 20 seconds ALL of the following lights are OFF:</p> <ul style="list-style-type: none">• Subgroup 4• Subgroup 5• Subgroup 22• LOSS OF FEED PUMP <p>Expected Action: As directed</p>
Examiner Note: When the operator reports that the RPCS has been returned to service, OR at the discretion of the Lead Examiner, may proceed to next event.		

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	CREW	Alarm for RU-1, Containment Atmosphere, is received and acknowledged on the RMS Computer Alarm response procedure 74RM-9EF41 is referenced for operator response.

74RM-9EF41, RU-1, Containment Atmosphere

	RO	NOTE The noble gas and particulate channels are RCS leak detection channels required by Technical Specification 3.4.16. Alarm setpoints are set to alert personnel to a significant increase in RCS leakage. The iodine channel is used to only alert personnel to increased iodine levels for the purpose of keeping personnel exposure ALARA. It is not used for indication of increased RCS leak rate.
	RO	Operations Response 1 If containment purge is in progress, secure the purge for an alarm on the particulate or gas channel. Expected Action: N/A. Purge <i>not</i> in progress.
	CREW	Operations Response 2 Notify RP of the alarm and, if applicable, inform personnel in containment of a possible airborne hazard. Expected Action: RP notified. No one is in Containment.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	CREW	Operations Response 3 Notify the Radiological Monitoring Technician of the alarm. Expected Action: Radiological Monitoring Technician notified.
	RO	Operations Response 4 Perform an RCS water inventory balance per 40ST-9RC02 if the particulate or gas channel indicates an increase in RCS leak rate (increasing radioactivity trend). (RCTS 037908.01) Expected Action: When rising Containment sump levels and/or temperatures are observed, the CRS implements 40AO-9ZZ02, Excessive RCS Leakrate, Section 3.0, RCS Leakage. Leakrate will be performed under the AOP.

40AO-9ZZ02, Excessive RCS Leakrate, Section 3.0, RCS Leakage

	CRS	Instruction 1 Enter AOP Entry Time and Date: Expected Action: As directed.
	CRS	Instruction 2 IF pressurizer level is lowering, AND additional makeup is required, THEN ensure all available Charging Pumps are running. Expected Action: N/A. Leak is within capabilities of existing charging pump configuration.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 3</p> <p>IF all available Charging Pumps are running, AND pressurizer level is lowering, THEN isolate letdown.</p> <p>Expected Action: N/A. Leak is within capabilities of existing charging pump configuration.</p>
	CRS	<p>Instruction 4</p> <p>IF ALL of the following alarms have been received:</p> <ul style="list-style-type: none">• Regenerative heat exchanger high temp (3A10A)• Letdown line low pressure (3A10A)• Letdown radiation monitor low flow (3A10B) <p>THEN ensure letdown is isolated.</p> <p>Expected Action: N/A. These alarms should not actuate.</p>
	CRS	<p>Instruction 5</p> <p>IF ALL of the following conditions exist:</p> <ul style="list-style-type: none">• All available Charging Pumps are operating• Letdown is isolated• Pressurizer level is lowering <p>THEN perform the following:</p> <ol style="list-style-type: none">a. Ensure that the Reactor is tripped.b. GO TO ONE of the following:<ul style="list-style-type: none">• 40EP-9EO01, Standard Post Trip Actions• 40EP-9EO11, Lower Mode Functional Recovery <p>Expected Action: N/A. Trip not required. PZR is relatively stable.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 6</p> <p>Ensure the event is being classified.</p> <p>Expected Action: CRS prompts SM to classify.</p>
	CRS	<p style="text-align: center;">NOTE</p> <p>Appendix I, LCO Required Action Tracker, is reference use, and may be performed by CRS, but should be provided to the SM or STA to be used as a guide to the LCO required actions.</p>
	CRS	<p>Instruction 7</p> <p>Initiate Appendix I, LCO Required Action Tracker.</p> <p>Expected Action: As directed.</p>
	CRS	<p>Instruction 8</p> <p>IF the unit is in Mode 1 - 4, THEN ensure compliance with LCO 3.4.14, RCS Operational Leakage. (Refer to Appendix I, LCO Required Action Tracker)</p> <p>Expected Action: Since the leak is UNIDENTIFIED leakage and the calculated leak rate is approximately 4 gpm, the CRS enters LCO 3.4.14, Condition A.</p>
	CREW	<p>Instruction 9</p> <p>Direct Chemistry to perform 74DP-9ZZ05, Abnormal Occurrence Checklist.</p> <p>Expected Action: As directed.</p>
	CREW	<p>Instruction 10</p> <p>Notify Radiation Protection that an RCS leak exists.</p> <p>Expected Action: Radiation Protection notified.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	RO	<p style="text-align: center;">NOTE</p> <p>RCS leakage into the RDT is identified leakage by design (UFSAR 5.2.5.5).</p>
	RO/CRS	<p>Instruction 11</p> <p>Determine the leakrate using ANY of the following:</p> <ul style="list-style-type: none">• Appendix A, 15 Minute Leak Rate Calculation• Appendix B, ERFDADS Leak Rate Determination• 40ST-9RC02, ERFDADS (Preferred) Calculation of RCS Water Inventory• 40ST-9RC05, Manual Calculation of RCS Water Inventory• Inventory• 40ST-9RC08, OAP (Backup) Calculation of RCS Water Inventory <p>Expected Action: RO calculates RCS leakrate IAW Appendix B. Determines that the leakrate is approximately 4 gpm. See Page 19.</p> <p>CRS determines that this exceeds the limit of 1 gpm for UNIDENTIFIED LEAKAGE and enters LCO 3.4.14, Condition A.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Instruction 12</p> <p>Evaluate ALL of the following to attempt to identify the source of the leakage:</p> <ul style="list-style-type: none">• Auxiliary Building and Containment radiation monitor alarms and trends• RU-4, 5, 6, 139, 140, 141, and 142 trending and alarm status• RCP seal cooler temperature• Nuclear Cooling Water return temperature from RCP(s)• Nuclear Cooling Water Surge Tank level and pressure alarms• Auxiliary Building and Containment sump levels and alarms• Containment humidity• Charging temperature and pressure• Steam Generator levels• Steam Generator feed / steam mismatch• EDT / RDT levels• Regen Hx exit temperature• Letdown line pressure• Letdown Radiation Monitor flow <p>Expected Action: Crew determines that the leak is inside Containment.</p>
	CREW	<p>Instruction 13</p> <p>Direct an operator(s) to walkdown charging and letdown piping.</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	CRS	Instruction 14 IF a Steam Generator tube leak is suspected, THEN GO TO Section 5.0, STEAM GENERATOR TUBE LEAK. Expected Action: N/A. No SGTR in progress
	CRS	Instruction 15 IF RCS to Nuclear Cooling Water leakage is suspected, THEN GO TO Section 4.0, RCS TO NC LEAKAGE. Expected Action: N/A. No leak to NCW in progress.
	CRS	Instruction 16 IF the leak is in the discharge of the Charging Pumps, THEN perform the following:... Expected Action: N/A. Leak is not in Charging Pump discharge.
		NOTE Cooling down letdown prior to isolation will prevent the leak from continuing to steam after isolation. Letdown flow of approximately 10 gpm will optimize the cooldown.
	CRS	Instruction 17 IF a leak in Letdown is indicated, THEN perform the following: ... Expected Action: N/A. Leak is not in letdown.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	CRS	Instruction 18 IF the leak is to any Safety Injection Tank, THEN perform the following: Expected Action: N/A. Leak is not to a SIT.
	CRS	Instruction 19 IF the leak is from any Pressurizer Relief Valve, THEN perform the following: Expected Action: N/A. Leak is not from a PZR Relief Valve.
	CRS	Instruction 20 Consider ALL of the following: <ul style="list-style-type: none">• Ability of LRS to keep up with the leak• Isolating Auxiliary Building Sumps discharge to LRS• De-energizing the Aux Building Sump Pumps• Isolating Containment Sumps discharge to LRS• De-energizing the Containment Sump Pumps Expected Action: As directed.
	CRS	Instruction 21 IF the leakage has NOT been isolated, THEN continue efforts to locate and isolate the leak. Expected Action: As directed.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 22</p> <p>IF the appropriate exit conditions listed in Section 2.0 have been met, THEN GO TO the appropriate procedure(s) for the current plant condition.</p> <p>Expected Action: If CRS reaches this point in the procedure, determines that the plant needs to be placed in COLD SHUTDOWN.</p>

40AO-9ZZ02, Appendix B, ERFDADS Leak Rate Determination

	RO	<p>Instruction 1</p> <p>Enter Appendix Entry Time and Date:</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 2</p> <p>Ensure Tc is constant (+/-1°F).</p> <p>Expected Action: Operators check ERFDADS for constant Tc.</p>
	RO	<p>Instruction 3</p> <p>Check that pressurizer pressure is stable between 2235 psia and 2265 psia.</p> <p>Expected Action: RO observes pressurizer pressure on ERFDADS or RCN-PR-100.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	RO	Instruction 4 Ensure Chemistry is NOT drawing samples from the RCS or CVCS. Expected Action: As directed.
	RO	Instruction 5 Ensure that ONE of the following conditions exist: <ul style="list-style-type: none">• Letdown is aligned to the VCT• Letdown is isolated Expected Action: RO checks lineup on B03. Notes UV-500 (CHN-HS-500) red VCT/RESET light is lit.
	RO	Instruction 6 Ensure that ONE of the following conditions exist: <ul style="list-style-type: none">• Charging pump suction is aligned to the VCT• Charging pumps are stopped Expected Action: RO checks lineup on B03. Notes UV-501 (CHN-HS-501) red OPEN light is lit.
	RO	Instruction 7 Place CHN-FIC-210X, Reactor Makeup Water to VCT, in "MANUAL" with zero output. Expected Action: As directed.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	RO	Instruction 8 Place CHN-FIC-210Y, Boric Acid Makeup to VCT, in "MANUAL" with zero output. Expected Action: As directed.
	RO	Instruction 9 Place CHN-HS-527, Make-up to Charging Pumps (VCT Bypass) Valve, in "CLOSED". Expected Action: As directed.
	RO	Instruction 10 WHEN CHN-UV-527 indicates closed, THEN place CHN-HS-210, Makeup Mode Select Switch, in "MANUAL". Expected Action: As directed.
	RO	Instruction 11 Select the "RCS LEAK RATE" box on the SPDS Overview screen. Expected Action: As directed.
	RO	Instruction 12 Select the "TREND-1" button on the Analog Point Attributes screen for point SPDS5047. Expected Action: As directed.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 13</p> <p>Ensure BOTH of the following on the trend screen for SPDS5047:</p> <ul style="list-style-type: none">• Range; - 20 to 80 gpm• Trend length 30 mins <p>Expected Action: As directed.</p>
	RO	<p>Instruction 14</p> <p>IF conditions (such as leakrate getting worse) require restoration of VCT Makeup prior to completing data collection, THEN GO TO step 18.</p> <p>Expected Action: N/A. Leakrate is steady.</p>
	RO	<p>Instruction 15</p> <p>Allow the trend to run for at least 15 minutes, OR until VCT level has lowered to 15%.</p> <p>Expected Action: RO allows trend to run for 15 minutes.</p>
	RO	<p>Instruction 16</p> <p>Interpret the leakrate trend using ALL of the following:</p> <ul style="list-style-type: none">• Indicated leakrate will lag behind changes in actual leakrate for at least 7.5 minutes• A constant slope indicates a constant leakrate• An increasing slope indicates an increasing leakrate• Actual leakrate is indicated when the trend stabilizes <p>Expected Action: RO observes the trend stabilizes.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **2**

Event Description: **Small RCS Leak (approximately 4 gpm)**

Time	Position	Applicant's Actions or Behavior
	RO	Instruction 17 Inform CRS of leakrate calculation results. Expected Action: RO informs CRS that leakrate is approximately 4 gpm.
		NOTE If an auto make-up demand occurs while the system is in manual, it may be necessary to reset CHN-HS-512 and/or CHN-HS-527.
	RO	Instruction 18 Restore VCT makeup by performing the following: <ul style="list-style-type: none">a. Place CHN-HS-210 in "AUTO".b. Place CHN-HS-527 in "OPEN/AUTO".c. Place CHN-FIC-210X in "AUTO".d. Place CHN-FIC-210Y in "AUTO". Expected Action: As directed.
Examiner NOTE: Once the CRS briefs the crew on entry into LCO 3.4.14, Condition A, OR at the discretion of the Lead Examiner, may proceed to the next event.		

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **3**

Event Description: **CEDM Fans “A” and “C” Trip, standby fans (HCN-A02B and A02D) fail to automatically start**

Time	Position	Applicant’s Actions or Behavior
	CREW	<p>Receives and acknowledges:</p> <ul style="list-style-type: none"> • Annunciator 7A09B (CEDM ACU COOL SYS TRBL), Group E • Computer alarm point HCYS49 (CEDM ACU A Fan A(C) Elect Prot) <p>Alarm response procedure 40AL-9RK7A is referenced for alarm response.</p>

Examiner Note: Since it takes about 8.5 minutes for the low oil reservoir alarm to come in for Event 4, Lead Examiner may want to initiate the oil leak during this event.

40AL-9RK7A, 7A09B (CEDM ACU COOL SYS TRBL)

	BOP	<p>Auto Action 1</p> <p>The breaker for the affected CEDM ACU will trip and the fan will stop.</p>
	BOP	<p>NOTE</p> <p>The Standby CEDM Air Cooling Fan starts after a Reset Time Delay. Backdraft dampers have been installed to allow any single CEDM Cooling Fan to provide sufficient cooling.</p>
	BOP	<p>Auto Action 2.</p> <p>IF the loss of one CEDM Fan in a CEDM ACU causes DP to fall below the auto start set point,</p> <p>OR the loss of two CEDM Fans in one CEDM ACU causes DP to fall below the auto start set point,</p> <p>THEN the standby CEDM Air Cooling Unit should auto start:</p> <ul style="list-style-type: none"> • HCA-HS-49, CEDM ACU FANS A/C A02A/A02C amber light on. • HCB-HS-50, CEDM ACU FANS B/D A02B/A02D amber light on.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **3**

Event Description: **CEDM Fans “A” and “C” Trip, standby fans (HCN-A02B and A02D) fail to automatically start**

Time	Position	Applicant’s Actions or Behavior
	BOP	<p>First Priority Operator Action 1 and 1.1 (NOT RUNNING)</p> <p>IF the in-service CEDM Air Cooling Unit is NOT running, AND the standby CEDM ACU did NOT auto start, THEN perform the following for the standby CEDM Air Cooling Unit:</p> <p>Place the applicable handswitch to the START position:</p> <ul style="list-style-type: none">• HCA-HS-49, CEDM ACU FANS A/C A02A/A02C.• HCB-HS-50, CEDM ACU FANS B/D A02B/A02D. <p>Expected Action: BOP waits for 2 minutes. When standby fans do not auto start, manually starts fans B/D.</p> <p>Examiner Note: The CRS may not allow the operator to put the tripped ACUs handswitches in Pull to Lock because he may want to quarantine the equipment to help determine the cause of the fault.</p> <p>Examiner Note: Expected Alarms:</p> <ul style="list-style-type: none">• 01A4D (120VAC 1E PNL D26 INVERTER B TRBL)• 01A5D (120VAC 1E PNL D28 INVERTER D TRBL) <p>AO Report: If dispatched to investigate inverter trouble alarms, wait 2 minutes and report that both inverters have a red “Inverter Loss of Sync” light.</p>
	BOP	<p>First Priority Operator Action 1.2</p> <p>Check for proper operation the running CEDM ACU using the indications on Panel B07.</p> <p>Expected Action: BOP checks HV-486, Nuclear Clg Wtr From CEDM ACU B Vlv, opens. Also checks CEDM fans B&D red lights are lit</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **3**

Event Description: **CEDM Fans “A” and “C” Trip, standby fans (HCN-A02B and A02D) fail to automatically start**

Time	Position	Applicant's Actions or Behavior
	CRS	First Priority Operator Action 2 IF BOTH CEDM fans fail to start, THEN GO TO 40AO-9ZZ20, Loss of HVAC, Section 10.0. Expected Action: CRS implements 40AO-9ZZ20.

40AO-9ZZ20, Loss of HVAC, Section 10.0 (possible alternate procedure for starting fans)

	CRS	Instruction 1 Enter AOP Entry Time and Date: Expected Action: As directed.
	CRS	CAUTION If RCS temperature is 300°F or more, CEDM coils may be damaged if CEDM Cooling is not restored or if the coils are not de-energized within 40 minutes of the initial loss.
	BOP	Instruction 2 IF any CEDM Fan is available, THEN start at least one CEDM Fan. Expected Action: BOP waits for 2 minutes. When standby fans do not auto start, manually starts fans B/D. Examiner Note: Annunciator (1A05D) 120VAC 1E PNL D28 INVERTER D TRBL will actuate when the standby fans are started.

Examiner Note: Once the BOP starts the standby CEDM fans, **OR** at the discretion of the Lead Examiner, may proceed to the next event.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **4**

Event Description: **RCP 1A Thrust Bearing Oil Leak**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Alarms are received and acknowledged. Operators are alerted by the following:</p> <ul style="list-style-type: none">• Annunciator 4A15A (RCP COMM TRBL)• Computer alarm point RCL107 (Low), RCP 1A BRG OIL RESVR LEVEL <p>Alarm response procedure 40AL-9RJ01 or 40AL-9RK4A is referenced for operator response.</p>

Examiner Note: The actions below are also now contained in 40AL-9RK4A Window 15A. These actions will remain in both procedures until the New PC is installed in all 3 units.

40AL-9RJ01, Point ID RCL107 (Low), RCP 1A BRG OIL RESVR LEV

	RO	<p>Operator Action 1</p> <p>Confirm the alarm using the PMS or ERFDADS point for the affected RCP Thrust Bearing Oil Reservoir level.</p> <p>Expected Action: RO calls up RCP 1A Group Display on the PMS or Point ID RCL107 on ERFDADS. Confirms level is below 64%.</p>
	RO	<p>Operator Actions 2 and 2.1</p> <p>IF any RCP thrust bearing oil reservoir level is less than 64%, THEN perform the following:</p> <p>Fill the affected RCP thrust bearing oil reservoir per 40OP-9RC01, Reactor Coolant Pump Operation.</p> <p>Expected Action: RO uses 40OP-9RC01, Section 6.14 to raise reservoir level. See Page 30.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **4**

Event Description: **RCP 1A Thrust Bearing Oil Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action 2.2</p> <p>Monitor the affected RCP thrust bearing oil reservoir level, for an increasing trend in oil leakage into the RCP Oil Collection System or back to the RCP Oil Lift Tank.</p> <p>Expected Action: RO monitors RCP 1A Group Display on the PMS or Point ID RCL107 on ERFDADS.</p>
	RO	<p>Operator Action 2.3</p> <p>IF the trend in oil leakage into the RCP Oil Collection System or back to the RCP Oil Lift Tank is increasing, THEN notify System Engineering to evaluate the need to remove the affected RCP from service.</p> <p>Expected Action: N/A. Trend is not increasing.</p>
	RO	<p>Operator Action 2.4</p> <p>Monitor the affected RCP thrust bearing temperature using ANY of the following:</p> <ul style="list-style-type: none">• Trend Recorder RMN-TJR-2 (B07)• Plant Monitoring System computer• ERFDADS computer <p>Expected Action: BOP/RO monitor RCP thrust bearing temperature as directed.</p>
	CRS	<p>Operator Action 2.5</p> <p>Evaluate affected RCP thrust bearing trends per 40AO-9ZZ04, Reactor Coolant Pump Emergencies, for required actions.</p> <p>Expected Action: CRS refers to 40AO-9ZZ04. See Page 33.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **4**

Event Description: **RCP 1A Thrust Bearing Oil Leak**

Time	Position	Applicant's Actions or Behavior
40OP-9RC01, Reactor Coolant Pump Operation. Section 6.14, Operation of RCP Lift Oil Pump P02A (RCP 1A)		
	RO	<p>Instruction 6.14.1</p> <p>IF starting RCN-P02A, RCP Lift Oil Pump P02A, in preparation for starting RCP 1A, THEN GO TO Section 6.1, Starting RCP 1A.</p> <p>Expected Action: N/A. RCP 1A is already running.</p>
	RO	<p>Instruction 6.14.2</p> <p>Place RCN-HS-10, RCP 1A Oil Lift Pump P02A, in STOP.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 6.14.3</p> <p>Ensure BOTH of the following are closed:</p> <ul style="list-style-type: none">• MCC Breaker NHN-M1517, RCP Oil Lift Pump P02A• MCC Breaker NHN-M1535, Backup Breaker for M1517 <p>Expected Action: RO knows breakers are closed because of indication on handswitch.</p>
	RO	<p>Instructions 6.14.4</p> <p>IF starting RCN-P02A, RCP Lift Oil Pump P02A, to warm the oil or fill the upper thrust bearing oil reservoir when RCP 1A is stopped, THEN perform the following:</p> <p>Expected Action: N/A. Not warming the oil and RCP 1A is running.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **4**

Event Description: **RCP 1A Thrust Bearing Oil Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instructions 6.14.5 and 6.14.5.1</p> <p>IF starting RCN-P02A, RCP Lift Oil Pump P02A, to fill the upper thrust bearing oil reservoir when RCP 1A is running, THEN perform the following:</p> <p>Check computer point RCL131, RCP 1A Oil Lift Tank Level, indicates greater than or equal to 1.0%.</p> <p>Expected Action: RO monitors RCP 1A Group Display on the PMS or Point ID RCL131 on ERFDADS.</p>
	RO	<p>Instruction 6.14.5.2</p> <p>Take and hold RCN-HS-10, RCP 1A Oil Lift Pump P02A, in START.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 6.14.5.3</p> <p>Monitor ERFDADS point RCL107P, RCP 1A BRG OIL RESVR Level.</p> <p>Expected Action: As directed.</p>
	RO	<p style="text-align: center;">NOTE</p> <p>Upper thrust bearing oil reservoir target level is 78%.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **4**

Event Description: **RCP 1A Thrust Bearing Oil Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 6.14.5.4</p> <p>WHEN RCP 1A upper thrust bearing oil reservoir level is between 64% and 85%, THEN release RCN-HS-10, RCP 1A Oil Lift Pump P02A, to AUTO.</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 6.14.5.5</p> <p>Notify the SM/CRS RCP 1A upper thrust bearing oil reservoir level is in the target band.</p> <p>Expected Action: As directed.</p>
	CRS	<p>Instruction 6.14.5.6</p> <p>IF ANY of the following conditions exist:</p> <ul style="list-style-type: none">• There is a four hour pump-up frequency of the thrust bearing• Kennett Unit low level occurs• A doubling of the net oil loss rate from the RCP oil system occurs over a 24 hour period <p>THEN notify the SM/CRS to assemble a Management Response Team (MRT).</p> <p>Expected Action: N/A. None of the conditions are met.</p>
40AO-9ZZ04, Reactor Coolant Pump Emergencies, Section 3.0, Abnormal RCP Motor or Bearing Parameters		
	CRS	<p>Instruction 1</p> <p>Enter AOP Entry Time and Date:</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **4**

Event Description: **RCP 1A Thrust Bearing Oil Leak**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 2</p> <p>IF ANY RCP NC low flow annunciators are in alarm, THEN PERFORM 40AO-9ZZ03, Loss of Cooling Water Section 4.0.</p> <p>Expected Action: N/A. No low flow alarms.</p>
	CRS	<p>Instruction 3</p> <p>IF ANY RCP Upper Thrust Bearing temperature is 245°F or more, (RCN-TE-156/166/176/186) OR motor amps is 520 amps or more, THEN perform the following:</p> <ul style="list-style-type: none">a. Ensure the Reactor is tripped.b. Stop the affected RCP.c. GO TO the appropriate procedure for the current plant conditions. <p>Expected Action: N/A. Upper Thrust Bearing temperature is normal at this time. (Takes approximately 45 minutes to exceed 245°F)</p>
	CRS	<p>Instruction 4</p> <p>IF ANY RCP Upper Thrust Bearing (temperature is trending to 245°F, THEN consider starting the Hydraulic Oil Lift Pump to slow the rate of temperature rise.</p> <p>Expected Action: N/A. Upper Thrust Bearing temperature is normal at this time. Temp will begin to rise later with no operator action. (Takes approximately 45 minutes to exceed 245°F)</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **4**

Event Description: **RCP 1A Thrust Bearing Oil Leak**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 5</p> <p>IF the RCP parameters indicated on RMN-TJR-2 points 1-32 exceed ANY of the trip setpoints listed in Appendix A, RCP Motor Or Bearing Trip Setpoints, THEN perform the following:</p> <ol style="list-style-type: none">Ensure the Reactor is tripped.Stop the affected RCP.GO TO the appropriate procedure for current plant conditions. <p>Expected Action: N/A. No temperature limits exceeded.</p>
	CRS	<p>Instruction 6</p> <p>IF ANY RCP motor or bearing parameter is trending to a trip setpoint (REFER TO Appendix D, Instrumentation and Setpoints), AND the CRS determines a plant shutdown or cooldown is needed, THEN perform BOTH of the following:</p> <ul style="list-style-type: none">The appropriate procedure to shutdown or cooldown the plant.40OP-9RC01, Reactor Coolant Pump Operation to stop the affected RCP. <p>Expected Action: N/A. No temperatures trending to a trip setpoint at this time.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **4**

Event Description: **RCP 1A Thrust Bearing Oil Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 7</p> <p>IF ANY of the following conditions exist:</p> <ul style="list-style-type: none">• Upper Thrust Bearing Oil Reservoir level, RCL107/ 117/127/137, is less than 64%.• Hydraulic Oil Lift Pump Reservoir level, RCL131/ 141/151/161, is less than 8%.• Motor Journal Bearing Oil Reservoir level, RCL108/ 109/118/119/128/129/138/ 139, is less than 28%. <p>THEN PERFORM Appendix C, Restoring RCP Oil Reservoir Levels.</p> <p>Expected Action: RO notes RCL107 less than 64%. Implements Appendix C. See below.</p>
	RO	<p>Instruction 8</p> <p>IF the appropriate exit conditions listed in Section 2.0 are met, THEN GO TO the appropriate procedure for the current plant conditions.</p> <p>Expected Action: When RO completes Appendix C and reports to CRS, CRS exits 40A)-9ZZ04.</p>
40AO-9ZZ04, Appendix C, Restoring RCP Oil Reservoir Levels		
	RO	<p>Instruction 1</p> <p>Enter Appendix Entry Time and Date:</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **4**

Event Description: **RCP 1A Thrust Bearing Oil Leak**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 2</p> <p>IF ANY RCP Upper Thrust Bearing Oil Reservoir level is 64% or less, AND the Hydraulic Oil Lift Pump Reservoir level is greater than 8%, THEN perform the following:</p> <ul style="list-style-type: none">a. Start the RCP's oil lift pump.b. WHEN level reaches the desired value between 64% and 85%, THEN stop the oil lift pump. <p>Expected Action: RO starts RCP 1A Oil Lift Pump. Holds switch in START until reservoir reaches level directed by CRS.</p>
	RO	<p>Instruction 3</p> <p>IF ANY RCP Upper Thrust Bearing Oil Reservoir level is 64% or less AND the Hydraulic Oil Lift Pump Reservoir level is 8% or less, THEN perform the following:...</p> <p>Expected Action: N/A. Hydraulic Oil Lift Pump Reservoir is greater than 8%.</p>
<p>Examiner NOTE: Once the RCP oil lift pump is returned to AUTO and the reservoir is filled per the CRS' direction, or at the discretion of the Lead Examiner, the next event may be initiated.</p>		

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Alarms for B01A are received and acknowledged:</p> <ul style="list-style-type: none">• Annunciator 1A03D (UNDV A CH TRIP)• Computer alarm point SAYS19 (ESF BUS UNDV CH A-1) <p>Alarm response procedure 40AL-9RK1A is referenced for operator response.</p>

40AL-9RK1A, 1A03D (UNDV A CH TRIP)

	RO	<p>Automatic Actions</p> <ul style="list-style-type: none">• One channel undervoltage relay trip - None• Two or more channel undervoltage relays tripped - Train A Load Shed actuates
	RO	<p>Operator Action 1.</p> <p>Confirm the alarm by ONE of the following:</p> <ul style="list-style-type: none">• Bus PBA-S03 Load Sheds and Diesel Generator A starts <p>Expected Action: N/A. Only 1 relay failed. No load shed occurs.</p>
		<p>NOTE</p> <p>The actuating undervoltage relays are arranged in 4 sets of two relays each. Output from both relays in any set will generate this alarm.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action 1 (continued)</p> <ul style="list-style-type: none"> 4.16KV BUS S03 Potential Indication undervoltage light(s) on panel B01 are off. (lights go off on under voltage - they will be on with normal power) <p>Expected Action: RO observes that the 727-1 light is OFF.</p>
	RO	<p style="text-align: center;">NOTE</p> <p>The actuating undervoltage relays are arranged in 4 sets of two relays each. This is a selective 2 out of 4 LOP/LS relay logic. Any 2 of 4 LOP//LS relays (UV1-UV4) will generate a loss of power load shed signal. Either of the undervoltage relays associate with a LOP/LS relay will actuate the LOP/LS relay. As an example you could have 727-1 and 727-8 relay to cause UV1 and UV4 to actuate and result in LOP/LS. Both UV relays for a LOP/LS relay DO NOT need to actuate to cause the LOP/LS UV relay to actuate, only 1 UV relay actuating will actuate its associated LOP/LS relay.</p>
	RO	<p>Operator Action 2</p> <p>IF greater than or equal to two BOP ESFAS LOP/LS undervoltage relays are actuated, THEN perform the following:...</p> <p>Expected Action: Since only 1 relay has failed, this action will <u>not</u> be performed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action 3 and 3.1</p> <p>IF one under voltage relay is actuated, THEN perform the following:</p> <p>Determine alarm validity using ALL of the following voltage indicators:</p> <ul style="list-style-type: none">• PEN-EI-G01, Diesel Generator A (AC volts)• PBA-EI-S03, 4.16kV Bus S03• PBA-EI-S03L, 4.16kV Bus S03 Norm Sply• PBA-EI-S03K, 4.16kV Bus S03 Alt Sply <p>Expected Action: RO observes voltage on the bus and breakers in normal positions.</p>
	RO	<p>Operator Action 3.2</p> <p>Determine actuated undervoltage relay using PBA-S03 undervoltage white relay lights on B01.</p> <p>Expected Action: On Panel B01, RO observes the white light "PHASE AB 727-1" (for the 4.16KV BUS POTENTIAL INDICATION) is extinguished)</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Operator Action 3.3</p> <p>IF the undervoltage relay has malfunctioned, THEN bypass malfunctioned undervoltage relay using 40OP-9SA01, BOP ESFAS Modules Operation.</p> <p>Expected Action: BOP bypasses failed UV relay IAW 40OP-9SA01. See next page.</p>
	CREW	<p>Operator Action 4</p> <p>Initiate PVAR.</p> <p>Expected Action: As directed.</p>
	CRS	<p>Operator Action 5</p> <p>REFER TO ALL the following Technical Specifications:</p> <ul style="list-style-type: none">• 3.3.7• 3.8.1• 3.8.2 <p>Expected Action: LCO 3.3.7, Diesel Generator (DG) – Loss of Voltage Start (LOVS), Condition A, is entered because only one LOVS channel is inoperable. Condition A requires the failed channel to be placed in bypass or trip within 1 hour. LCO 3.8.1, AC Sources – Operating, is still met because the failed relay channel does not make offsite sources, the associated DG, or the load sequencer inoperable. LCO 3.8.2, AC Sources – Shutdown, is not applicable because the Unit is NOT in Mode 5 or 6.</p>

**40OP-9SA01, BOP ESFAS Modules Operation, Section 6.8,
Placing BOP ESFAS Modules in Bypass**

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>NOTE</p> <p>Bypassing the BOP ESFAS modules only blocks the field inputs (radiation monitor, UV relay) and the test input trips. Manual initiation and cross-trips from an unbypassed module will still function.</p>
	BOP	<p>Instruction 6.8.1 and 6.8.1.1</p> <p>ALL of the following Prerequisites are met:</p> <ul style="list-style-type: none"> • Both Trains of BOP ESFAS are energized • The redundant module in the opposite BOP ESFAS Train is NOT in Bypass • If the BOP ESFAS module(s) are required to be OPERABLE per LCO 3.3.7, Diesel Generator (DG) - Loss of Voltage Start (LOVS), the UV Relays in the opposite BOP ESFAS Train are NOT in Bypass • The Sequencer module to be placed in Bypass is NOT in Auto Test <p>Expected Action: BOP determines that Prerequisites are met.</p>
	CRS	<p>Instruction 6.8.2 and 6.8.2.1</p> <p>Initial Conditions</p> <p>All applicable LCOs, and the Offsite Dose Calculation Manual (for radiation monitor input), have been reviewed for compensatory action requirements.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6.8.2.2.</p> <p>The BOP ESFAS door keys have been obtained.</p> <p>Expected Action: BOP obtains key from in front, and to the right, of CRS.</p>
	BOP	<p>Instruction 6.8.2.3.</p> <p>The BOP ESFAS Bypass keys have been obtained.</p> <p>Expected Action: BOP obtains key from in front, and to the right, of CRS.</p>
	CRS	<p>Instruction 6.8.24.</p> <p>Fuel Services has been notified that the Fuel Building Radiation Monitors will be INOPERABLE, if any Dry Cask or Fuel Handling operations are in progress.</p> <p>Expected Action: N/A. FB Rad Monitors are OPERABLE.</p>
	CRS	<p>Instruction 6.8.2.5.</p> <p>Permission has been obtained from the SM/CRS to place BOP ESFAS module(s) in Bypass.</p> <p>Expected Action: By directing the BOP to bypass, permission is granted.</p> <p>Examiner Note: The following are expected alarms during this evolution:</p> <ul style="list-style-type: none"> • 5A02D (BOP ESFAS IN TEST) – clears when door closed • 5A03D (BOP ESFAS CH BYP)

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6.8.3</p> <p>IF a radiation monitor is to be placed in Local or Bypass due to transfer of radioactive material in the area of the radiation monitor,</p> <p>THEN check BOTH of the following:</p> <ul style="list-style-type: none"> • Radiation Protection is available to monitor the transfer of radioactive material. • Communications are established between the monitored area and the Control Room. (This will ensure that the proper BOP ESFAS function can be manually actuated in the event predetermined radiation levels are exceeded.) <p>Expected Action: N/A. Not a radiation monitor.</p>
	BOP	<p>NOTE</p> <p>Performance of Step 6.8.4 may activate alarm window BOP ESFAS IN TEST (5A02D) when the BOP ESFAS cabinet door is opened.</p>
	BOP	<p>Instruction 6.8.4</p> <p>Perform a lamp test on the affected BOP ESFAS cabinet.</p> <p>Expected Action: BOP depresses and holds LAMP TEST pushbutton.</p>
	BOP	<p>NOTE</p> <p>The blank areas associated with ALL of the following will be OFF.</p> <ul style="list-style-type: none"> • DG RUN • DG BKR • FBEVAS

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	BOP	Instruction 6.8.5 Ensure all lamps of the affected BOP ESFAS cabinet are ON. Expected Action: BOP observes that all lights are lit.
	BOP	Instruction 6.8.6 IF any lamp(s) are OFF during the lamp test, THEN perform the following:
	BOP	CAUTION Pressing the backlighted pushbutton too far or inadvertently pressing an adjacent pushbutton while replacing a burned out lamp may result in an actuation.
	BOP	Instruction 6.8.6.1 Replace any bulb(s) for the lamp(s) that were OFF. Expected Action: BOP replaces bulbs, if necessary.
	BOP	Instruction 6.8.6.2 Perform a second lamp test on the affected BOP ESFAS cabinet. Expected Action: BOP depresses and performs a LAMP TEST.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>NOTE</p> <p>The blank areas associated with ALL of the following will be OFF.</p> <ul style="list-style-type: none"> • DG RUN • DG BKR • FBEVAS
	BOP	<p>Instruction 6.8.6.3</p> <p>Ensure all lamps of the affected BOP ESFAS cabinet are ON.</p> <p>Expected Action: BOP observes that all lights are lit.</p>
	BOP	<p>Instruction 6.8.6.4</p> <p>IF replacing bulb(s) does NOT correct the problem, THEN perform the following:</p> <ol style="list-style-type: none"> Notify the SM/CRS of the condition. Initiate a PVAR for I&C to repair the lamp(s). <p>Expected Action: If bulbs are replaced, problem is corrected.</p>
	BOP	<p>Instruction 6.8.7</p> <p>Select the module(s), trip circuit(s), or relay channel(s) to be placed in Bypass by placing a check mark next to the device:</p> <p>Expected Action: BOP checks block to left of 727-1.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: center;">NOTE</p> <p>A bypassed FBEVAS, CREFAS and CPIAS module will show a single Bypass light ON.</p> <p>Expected Action: N/A. UV relay is NOT one of these modules.</p>
	BOP	<p style="text-align: center;">CAUTION</p> <p>Placing a FBEVAS, CREFAS or CPIAS module in Bypass when the redundant module in the other train is already in Bypass will cause both modules to come out of Bypass.</p> <p>Expected Action: N/A. UV relay is NOT one of these modules.</p>
	BOP	<p>Instruction 6.8.8</p> <p>IF ANY of the following BOP ESFAS modules will be placed in Bypass:</p> <ul style="list-style-type: none"> • FBEVAS • CREFAS • CPIAS <p>THEN check the redundant Train BOP ESFAS module is NOT in Bypass.</p> <p>Expected Action: N/A. These modules will <i>not</i> be placed in bypass.</p>
	BOP	<p style="text-align: center;">CAUTION</p> <p>Placing a CRVIAS module in Bypass when the redundant CRVIAS module in the other Train is already in Bypass will cause both relays to come out of Bypass.</p> <p>Expected Action: N/A. UV relay is NOT one of these modules.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 6.8.9</p> <p>IF a CRVIAS module will be bypassed, THEN check the same trip circuit in the redundant CRVIAS module is NOT in Bypass.</p> <p>Expected Action: N/A. UV relay is NOT one of these modules.</p>
	BOP	<p>NOTE</p> <ul style="list-style-type: none">• A bypassed LOP/LS module will show one or more of the U/V-1 to U/V-4 Bypass lights ON.• All four relays on one LOP/LS module may be bypassed at the same time if the module is not required to be OPERABLE.
	BOP	<p>CAUTION</p> <p>Placing a LOP/LS relay in Bypass when the redundant relay in the other train is already in Bypass will cause both relays to come out of Bypass.</p> <p>Expected Action: N/A. Other Train is NOT in Bypass.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 6.8.10 and 6.8.10.1</p> <p>IF a LOP/LS module will be bypassed, THEN perform the following:</p> <p>Ensure compliance with ALL of the following LCOs:</p> <ul style="list-style-type: none"> • 3.3.7, Diesel Generator (DG) - Loss of Voltage Start (LOVS) • 3.8.1, AC Sources - Operating • 3.8.2, AC Sources - Shutdown <p>Expected Action: LCO 3.3.7, Diesel Generator (DG) – Loss of Voltage Start (LOVS), Condition A is entered because only one LOVS channel is inoperable. Condition A requires the failed channel to be placed in bypass or trip within 1 hour. LCO 3.8.1, AC Sources – Operating, is still met because the failed relay channel does not make offsite sources, the associated DG or the load sequencer inoperable. LCO 3.8.1, AC Sources – Shutdown, is not applicable because the Unit is NOT in Mode 5 or 6.</p>
	BOP	<p>Instruction 6.8.10.2</p> <p>Check the LOP/LS module in the opposite Train is NOT in Bypass.</p> <p>Expected Action: BOP checks the LOP/LS module on BOP ESFAS Cabinet “B” (to the right of “A”). Notes the “BYP” light for UV-1 is <i>not</i> lit.</p>
	BOP	<p>Instruction 6.8.11 and 6.8.11.1</p> <p>Perform the following to bypass the module/trip circuit/relay channel:</p> <p>Insert the Bypass key in the slot for the selected module.</p> <p>Expected Action: BOP inserts key in the LOP/LS UV-1 slot.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
	BOP	<p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> Alarm window BOP ESFAS CH BYP (5A03D) is expected when the module, trip circuit, or relay channel is placed in Bypass. The keylocks are captive and the keys are left in place while the modules are in Bypass.
	BOP	<p>Instruction 6.8.11.2</p> <p>Turn the Bypass Key clockwise 1/4 turn or until the Bypass light comes ON.</p> <p>Expected Action: BOP turns key ¼ turn.</p>
	BOP	<p>Instruction 6.8.12</p> <p>Repeat Step 6.8.11 for all module(s), trip circuit(s), or relay channel(s) selected in Step 6.8.7.</p> <p>Expected Action: N/A. No other modules or relays will be bypassed.</p>
	BOP	<p>Instruction 6.8.13</p> <p>Verify that all module(s), trip circuit(s), or relay channel(s) selected in Step 6.8.7 are placed in Bypass.</p> <p>Expected Action: BOP observes that the "BYP" light is lit for the LOP/LS module on BOP ESFAS Cabinet "A."</p>
	RO	<p>Instruction 6.8.14</p> <p>Ensure manipulation of components requiring Independent Verification are documented per 02DP-0ZZ01, Verification of Plant Activities.</p> <p>Expected Action: IV will be performed by other operator.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **5**

Event Description: **UV-1 LOV Relay for PBA-S03 Fails**

Time	Position	Applicant's Actions or Behavior
		<p>Instruction 6.8.15</p> <p>Ensure BOP ESFAS door keys are returned to the proper storage location.</p> <p>Expected Action: BOP returns keys to in front, and to the right, of CRS.</p>
Examiner Note: Once the BOP ESFAS keys are returned, OR when Lead Examiner deems appropriate, the next event may be initiated.		

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Alarms are received and acknowledged. Operators are alerted by the following:</p> <ul style="list-style-type: none"> • Annunciator 1C12B (120 VCA PNL D11/D12/15/16 TRBL) • Numerous annunciators on B03, B04, and other panels • Loss of power to recorders for Pressurizer level and VCT level/pressure • Numerous Computer alarm points <p>Alarm response procedure 40AL-9RK1C may be referenced for operator response.</p>

40AL-9RK1C, 1C12B (120 VCA PNL D11/D12/15/16 TRBL), Point ID NNYS3 (Bkr Ovld Trip)

	RO	<p>Operator Action 1</p> <p>Direct an Auxiliary Operator to investigate the cause of the alarm: (NNN-D11, NNN-D12 Control Bldg 120')</p> <ul style="list-style-type: none"> • Ground detection indicating light on at the center panel of the switchgear Undervoltage relay 27-1 target indication on normal power supply at the switchgear transfer switch panel • Undervoltage relay 27-2 target indication on back-up power supply at the switchgear transfer switch panel • Tripped main supply breaker • Tripped 120V AC Non-Class 1E Distr Panel load breaker <p>Expected Action: RO sends AO to investigate.</p> <p>AO Report: There is a ground detection indicating light on the center panel of the switchgear and that the bus feeder breaker 52-D11 has tripped.</p>
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Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Operator Action 2</p> <p>IF NNN-D11, 120V AC Non-Class 1E Distr Pnl OR NNN-D12, 120V AC Non-Class 1E Distr Pnl is de-energized, THEN perform 40AO-9ZZ14, Loss of Non Class Instrument or Control Power.</p> <p>Expected Action: CRS implements 40AO-9ZZ14.</p>
	RO/BOP	<p>Operator Action 3</p> <p>Perform control board walkdown for ALL of the following:</p> <ul style="list-style-type: none">• Off-normal dual light indications• Loss of normal light indications• Off-normal SEIS panel indications <p>Expected Action: BOP and RO walk down boards.</p>
	CREW	<p>Operator Action 4</p> <p>IF a tripped breaker is found on NNN-D11 or NNN-D12, 120V AC Non-Class 1E Distr Pnl, THEN notify FIN/electrical maintenance to assist in identifying the cause of the breaker trip.</p> <p>Expected Action: FIN/electrical maintenance notified.</p>
	CREW	<p>Operator Action 5</p> <p>Initiate PVAR.</p> <p>Expected Action: PVAR initiated.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Operator Action 6</p> <p>IF bus undervoltage relay targets were actuated on NNN-D11 or NNN-D12 120V AC Non-Class 1E Distr Pnl, THEN initiate a PVAR to investigate the cause of the low voltage condition on the applicable power supply:</p> <ul style="list-style-type: none"> • NNN-D11, normal power supply NHN-M1315 • NNN-D11, backup power supply PHA-M3107 • NNN-D12, normal power supply NHN-M1008 • NNN-D12, backup power supply PHB-M3208 <p>Expected Action: N/A. No UV condition exists.</p>
	CREW	<p>Operator Actions 7, 7.1, and 7.2</p> <p>IF the Ground Detection indicating light on the center panel of NNN-D11 or NNN-D12 120V AC Non-Class 1E Distr Pnl is on, THEN perform the following:</p> <p>Notify PR&C to assist in locating the ground.</p> <p>Initiate a PVAR for corrective action.</p> <p>Expected Action: PR&C notified. PVAR initiated.</p>

40AO-9ZZ14, Loss of Non-Class Instrument or Control Power, Section 8.0, Loss of NNN-D11.

	CRS	<p>Instruction 1</p> <p>Enter AOP Entry Time and Date:</p> <p>Expected Action: As directed.</p>
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Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	BOP	Instruction 2 Operate ADVs as needed to maintain steam generator pressure. Expected Action: N/A since ADVs are not open
	RO	Instruction 3 Ensure ALL of the following handswitches are selected to Channel "X": <ul style="list-style-type: none">• RCN-HS-110, Level Control Selector Switch• RCN-HS-100-3, Heater Control Selector Switch• RCN-HS-100, Pressure Control Selector Switch Expected Action: RO places RCN-HS-110 and RCN-HS-100 in the "X" position.
	BOP	Instruction 4 Ensure CEDMCS is NOT selected to Auto Sequential "AS". Expected Action: BOP places MODE SELECT switch to "MS" or "SB" (most likely positions)
	RO	Instruction 5 IF pressurizer level is 33% or more and rising, THEN ensure no more than one Charging Pump is running. Expected Action: RO ensures only 1 Charging Pump is running.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 6</p> <p>Ensure compliance with ALL of the following LCOs:</p> <ul style="list-style-type: none"> • LCO 3.2.1, Linear Heat Rate (LHR) • LCO 3.2.2, Planer Radial Peaking Factors (Fxy) • LCO 3.2.3, Azimuthal Power Tilt (Tq) • LCO 3.2.4, Departure From Nucleate Boiling Ratio (DNBR) • LCO 3.2.5, Axial Shape Index (ASI) <p>Expected Action: CRS evaluates given Tech Specs.</p>
	CRS	<p>Instruction 7</p> <p>PERFORM 40DP-9OP05, Control Room Data Sheet Instructions, for the loss of the JSCALOR.</p> <p>Expected Action: Since JSCALOR is not available and COLSS is functioning, 40DP-9OP05, Instruction 3.3.11 directs the crew to record the current NKBDELTC values and establish that value as the current steady state maximum power.</p>
	CRS	<p>Instruction 8</p> <p>IF letdown was in service, THEN PERFORM 40AO-9ZZ05, Loss of Letdown.</p> <p>Expected Action: CRS directs RO to perform 40AO-9ZZ05. See Page 44.</p>
	CRS	<p>Instruction 9</p> <p>IF the LRS Evaporator is in service, THEN direct an operator to shutdown the LRS Evaporator.</p> <p>Expected Action: N/A. LRS Evaporator not in service.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Instruction 10</p> <p>IF a ground is indicated on NNN-D11, THEN contact Electrical Maintenance for assistance in ground isolation.</p> <p>Expected Action: Electrical Maintenance contacted.</p>
	CRS	<p>Instruction 11</p> <p>PERFORM the applicable action in the Offsite Dose Calculation Manual for a loss of process flow to SQN-RU-143/144, Plant Vent Monitors.</p> <p>Expected Action: CRS informs SM of this direction.</p>
	RO	<p>Instruction 12</p> <p>IF VCT level reaches 5%, AND charging pump suction is aligned to the VCT, THEN perform the following:</p> <ul style="list-style-type: none"> a. Close CHB-HV-255, Seal Injection Supply Header Isolation Valve. b. Place all Charging Pumps in "PULL TO LOCK". <p>Expected Action: N/A. VCT level is > 5%.</p>
	CRS	<p style="text-align: center;">NOTE</p> <p>If the PC Cleanup Pumps are aligned to the RWT, there is inadequate suction pressure for all three Charging Pumps to operate.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 13</p> <p>IF RWT level is greater than 73%, AND is it is desired to align charging pump suction to the RWT, THEN perform the following:</p> <ul style="list-style-type: none">a. IF it is desired to use CHE-HV-536, RWT to Charging Pumps, THEN perform the following:<ul style="list-style-type: none">1) Ensure the BAMPs are stopped.2) Open CHE-HV-536, RWT to Charging Pumps.b. IF it is desired to use CHN-UV-514, Boric Acid Makeup to Charging Pumps Valve, THEN perform the following:<ul style="list-style-type: none">1) Ensure CHN-UV-514 is open.2) Ensure a BAMP is running.c. Ensure CHN-UV-501, VCT Outlet Valve is closed. <p>Expected Action: CRS N/As this step.</p>
	CRS	<p>Instruction 14</p> <p>IF RWT level is 73% or less, AND is it is desired to align charging pump suction to the RWT, THEN PERFORM Appendix D, Aligning the Charging Pump Alternate Suction to the RWT.</p> <p>Expected Action: N/A. RWT is > 73%.</p>
	CRS	<p>Instruction 15</p> <p>REFER TO Appendix B, Effects of the Loss of NNN-D11.</p> <p>Expected Action: CRS refers to Appendix B.</p>
	CRS	<p>Instruction 16</p> <p>REFER TO 40OP-9NN01, 120V AC Non-Class 1E Instrument Power (NN), for a complete list of indication and controls lost.</p> <p>Expected Action: CRS may refer to 40OP-9NN01.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 17</p> <p>Ensure at least one of the Letdown Isolation Valves is closed.</p> <p>Expected Action: RO ensures that either UV-515 (CHB-HS-515) or UV-516 (CHA-HS-516) indicate a green CLOSED light.</p>
	CRS	<p>Instruction 18</p> <p>IF NNN-D11 can NOT be energized, THEN GO TO the appropriate procedure for the current plant conditions.</p> <p>Expected Action: Normal operations at 100% are performed under 40OP-9ZZ05, Power Operations.</p>

40AO-9ZZ05, Loss of Letdown

	RO	<p>Instruction 1</p> <p>Enter AOP Entry Time and Date:</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 2</p> <p>IF the Pressurizer is solid, THEN perform the following:...</p> <p>Expected Action: N/A. PZR is not solid.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 3</p> <p>Place RCN-LIC-110, PLCS Master Controller, in "MAN" and close the selected Letdown Control Valve(s).</p> <p>Expected Action: As directed.</p>
	RO	<p>Instruction 4</p> <p>Check that letdown backpressure is less than setpoint.</p> <p>Expected Action: On B03, RO checks that the red pointer on CHN-PIC-201, LETDOWN BACKPRESSURE CONTROL, is below the black pointer.</p>
	RO	<p>Instruction 5</p> <p>IF pressurizer level is 33% or more AND rising, THEN ensure no more than one Charging Pump is running.</p> <p>Expected Action: RO ensures no more than one Charging Pumps is running.</p>
	CRS	<p>Instruction 6</p> <p>IF BOTH of the following conditions exist:</p> <ul style="list-style-type: none">• The unit is in Mode 1, 2 or 3• Pressurizer level is 56% or more and rising <p>THEN perform the following:</p> <ol style="list-style-type: none">a. Enter LCO 3.4.9, Pressurizer, Condition A.b. Initiate actions in preparation for a Unit shutdown within 6 hours. <p>Expected Action: PZR level <i>may</i> be > 56% (depends on timing of actions). If so, CRS enters LCO 3.4.9, Pressurizer, Condition A.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 7</p> <p>Determine the cause of the loss of letdown (REFER TO Appendix E, Supplementary Information) by evaluating ANY of the following:</p> <ul style="list-style-type: none"> • PLCS failures • NC flow to Letdown Heat • Exchanger • SIAS/CIAS • CVCS component failures • Loss of IA • Loss of power <p>Expected Action: RO determines that a loss of power (NNN-D11) caused the loss of letdown. (UV-515 and UV-516 failed closed)</p>
	RO	<p>Instruction 8</p> <p>IF RCS pressure is less than 1000 psia, AND it is desired to place the standby valve in service, THEN PERFORM Appendix F, Aligning Letdown Control And Backpressure Valves.</p> <p>Expected Action: N/A. RCS pressure is > 1000 psia.</p>
	RO	<p>Instruction 9</p> <p>IF the selected Letdown Control or Backpressure Control Valve(s) has failed, AND it is desired to place the standby valve in service, THEN PERFORM Appendix F, Aligning Letdown Control And Backpressure Valves.</p> <p>Expected Action: N/A. Standby valve will <i>not</i> be placed in service.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 10</p> <p>IF ALL of the following conditions exist:</p> <ul style="list-style-type: none"> • CHB-UV-515, Regen Hx Inlet Isolation, closed due to an invalid high temperature interlock • CHN-TI-221, Regenerative Heat Exchanger Letdown Temperature, indication is available • Letdown is desired... <p>Expected Action: N/A. Letdown cannot be established with loss of NNN-D11.</p>
	RO	<p>Instruction 11</p> <p>IF CHB-UV-523, Regen Hx Outlet Isolation is closed due to an invalid high temperature alarm, AND letdown is desired, THEN place CHB-HS-523, LETDOWN CTMT ISOL, to "OPEN".</p> <p>Expected Action: N/A. Letdown cannot be established with loss of NNN-D11.</p>
	RO	<p>Instruction 12</p> <p>IF the Pressurizer is solid, AND RCS pressure is less than 500 psia, THEN perform the following to restore letdown:...</p> <p>Expected Action: N/A. PZR is <i>not</i> solid.</p>
	RO	<p>Instruction 13</p> <p>IF letdown can be restored, THEN perform the following:...</p> <p>Expected Action: N/A. Letdown cannot be established with loss of NNN-D11.</p>
	RO	<p>Instruction 14</p> <p>IF a plant shutdown or cooldown is needed, THEN perform the following:</p> <p>Expected Action: N/A. Plant shutdown or cooldown is not required at this time.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	RO	Instruction 15 IF a plant shutdown or cooldown is NOT needed, THEN PERFORM Appendix C, Extended Operations Without Letdown. Expected Action: RO implements Appendix C. See below.
40AO-9ZZ05, Appendix C, Extended Operations Without Letdown		
	RO	Instruction 1 Enter Appendix Entry Time and Date: Expected Action: As directed.
	RO	Instruction 2 WHEN letdown can be restored, THEN GO TO Appendix A, Restoration of Letdown With A Pressurizer Steam Bubble. Expected Action: N/A. Letdown cannot be established with loss of NNN-D11.
	RO	NOTE Boron equalization should be minimized since it depletes RCS hydrogen. The reduction in RCS hydrogen concentration may require entry into chemistry actions levels that may cause the unit to be shutdown.

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 3</p> <p>IF boron equalization is in progress, THEN stop boron equalization.</p> <p>Expected Action: N/A. Boron equalization is not in progress.</p>
	RO	<p>Instruction 4</p> <p>Notify Chemistry that the plant will be operated with letdown flow isolated.</p> <p>Expected Action: Chemistry is notified.</p>
	RO	<p style="text-align: center;">NOTE</p> <p>RCP HP seal cooler inlet temperature is expected to rise to between 200°F and 220°F when seal injection is stopped. All other seal temperatures are expected to remain normal.</p>
	RO	<p style="text-align: center;">NOTE</p> <p>Intentional entry into L.C.O. 3.4.9, Pressurizer, Condition A is prohibited.</p>
	RO	<p>Instruction 5</p> <p>WHEN the CRS determines seal injection and charging are to be stopped, OR pressurizer level is 56% or more and rising, THEN perform the following:</p> <ol style="list-style-type: none"> IF the unit is in Mode 1, 2 or 3, THEN ensure compliance with LCO 3.4.9, Pressurizer. Ensure controlled bleedoff is isolated on all standby RCP's prior to Seal 2 Outlet Temperature exceeding 250°F. Close the Seal Injection Flow Control Valves. Place all Charging Pumps in "PULL TO LOCK". <p>Expected Action: RO closes Seal Injection FCVs and places all Charging Pumps in PTL.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	RO	<p style="text-align: center;">NOTE</p> <p>RCP controlled bleedoff will lower pressurizer level approximately 10% in 55 minutes. This assumes three gpm bleedoff flow from each RCP</p>
	RO	<p>Instruction 6</p> <p>IF ALL of the following conditions are met:</p> <ul style="list-style-type: none">• Charging has been stopped• Pressurizer level is less than 53%• Raising Pressurizer level is desired <p>THEN perform the following:</p> <ol style="list-style-type: none">a. Open CHN-PDV-240, Charging Line to Reactor Coolant Loop 2A Differential Pressure Control Valve.b. Start at least one Charging Pump.c. Adjust CHN-PDIC-240 to 90-135 psid and place in "AUTO".d. Operate charging as needed to maintain pressurizer level between 33 and 53%. <p>Expected Action: May be performed later.</p>
	RO	<p>Instruction 7</p> <p>IF BOTH of the following conditions are met:</p> <ul style="list-style-type: none">• Charging has been stopped• Seal injection is needed... <p>Expected Action: N/A. Seal injection is <i>not</i> needed at this time.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **6**

Event Description: **Loss of NNN-D11/Loss of Letdown**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 8</p> <p>IF VCT level needs to be lowered, THEN direct an operator to perform the following:</p> <ul style="list-style-type: none">a. Open CHN-V117, VCT drain to the EDT (Blending Room, 120' of the Auxiliary Bldg.).b. WHEN the desired level is reached, THEN close CHN-V117. <p>Expected Action: N/A. VCT level does not need to be lowered.</p>
Examiner Note: When the RO has completed the actions in 40AO-9ZZ05, Loss of Letdown, or at the discretion of the Lead Examiner, the next event may be initiated.		

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Crew is alerted by the following:</p> <ul style="list-style-type: none"> • Rising Containment temperature and pressure. • Lowering Pressurizer level. <p>Expected Action: CRS enters 40EP-9EO01, Standard Post Trip Actions.</p>

40EP-9EO01, Standard Post Trip Actions

	CRS	<p>Instruction 1</p> <p>Open the Placekeeper and enter the EOP Entry Time.</p> <p>Expected Action: As directed.</p>
	<p>RO</p> <p>Event 7</p>	<p>Instruction 2</p> <p>Determine that Reactivity Control acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that reactor power is dropping Check that start-up rate is negative Check that ALL full strength CEAs are inserted <p>Expected Action: Crew notes that Reactor did not trip.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Contingency Action 2.a.1</p> <p>Manually trip the Reactor.</p> <p>Expected Action: BOP manually initiates a Reactor trip by depressing 4 MANUAL REACTOR TRIP pushbuttons.</p>
CRITICAL TASK: Trip the Reactor prior to exiting Step 2 of SPTAs		SAT / UNSAT
	CREW	<p>Instruction 3</p> <p>Determine that Maintenance of Vital Auxiliaries acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that the Main Turbine is tripped Check that the Main Generator output breakers are open Check that station loads have transferred to offsite electrical power such that BOTH of the following conditions are met: <ul style="list-style-type: none"> All vital and non-vital AC buses are powered All vital and non vital DC buses are powered <p>Expected Action: RO reports all vital and non-vital AC & DC buses are powered from off-site, except for NNN-D11. RO reports both DGs running unloaded with Spray Pond support. BOP reports Main Turbine has tripped and Main Generator output breakers are open.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 4</p> <p>Determine that RCS Inventory Control acceptance criteria are met by the following:</p> <ul style="list-style-type: none"> a. Check that pressurizer level meets BOTH of the following: <ul style="list-style-type: none"> • 10-65% • Trending as expected to 33-53% b. Check that the RCS is 24°F or more subcooled c. Check that BOTH of the following are in service to all RCPs <ul style="list-style-type: none"> • Seal injection • Nuclear Cooling Water <p>Expected Action: RO reports PZR level is <i>not</i> trending to 33-53% and subcooling is <i>less than</i> 24°F. Depending on existing Charging Pump configuration, RO may, or may NOT, observe seal injection in service. RO observes NCW is in service to all RCPs.</p>
	RO	<p>Contingency Action 4.a.1</p> <p>Restore and maintain pressurizer level to 33 - 53% by ANY of the following:</p> <ul style="list-style-type: none"> • Operation of PLCS • Manual operation of Charging Pumps and Letdown Control Valves <p>Expected Action: RO manually operates Charging Pumps as required, based on Pressurizer level response.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Contingency Action 4.b.1</p> <p>IF the RCS is less than 24°F subcooled, THEN stop all RCPs.</p> <p>Expected Action: RO secures all RCPs.</p>
	CRS/RO	<p>Instruction 5</p> <p>Determine that RCS Pressure Control acceptance criteria are met by BOTH of the following:</p> <ul style="list-style-type: none"> • Pressurizer pressure is 1837-2285 psia • Pressurizer pressure is trending as expected to 2225-2275 psia <p>Expected Action: RO observes that Pressurizer pressure is <i>not</i> trending to 2225-2275 psia.</p>
	RO	<p>Contingency Action 5.1</p> <p>Restore and maintain pressurizer pressure to the normal control band by ANY of the following:</p> <ul style="list-style-type: none"> • Operation of PPCS • Manual operation of pressurizer heaters and spray valves <p>Expected Action: RO may take manual control of RCN-PIC-100 and/or manually control heaters to attempt to raise PZR pressure.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior	
	RO Event 8	Contingency Action 5.2 IF pressurizer pressure drops to the SIAS setpoint, THEN ensure that SIAS is actuated. Expected Action: RO observes that HPSI Pump "A" has tripped and HPSI Pump "B" has failed to automatically start. The RO starts HPSI Pump "B."	
CRITICAL TASK: Manually start HPSI Pump "B" prior to exiting SPTAs.			SAT / UNSAT
	RO	Instruction 6 Determine that Core Heat Removal acceptance criteria are met by ALL of the following: <ul style="list-style-type: none"> • At least one RCP is operating • Loop ΔT is less than 10°F • RCS is 24°F or more subcooled Expected Action: RO reports that no RCPs are operating and that subcooling is less than 24 °F.	

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	CRS/BOP	<p>Instruction 7</p> <p>Determine that RCS Heat Removal acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that at least one Steam Generator meets BOTH of the following conditions: <ul style="list-style-type: none"> Level is 35% WR or more Feedwater is restoring or maintaining level 45-60% NR Check that T_C is 560-570°F Check that steam generator pressure is 1140-1200 psia <p>Expected Action: RCS temperature will be low due to SI flow. BOP uses ADVs to control SG pressure. BOP allows DFWCS to feed with Main Feed until the MSIS, at which time the BOP transitions to AFB-P01 (or AFN-P01).</p>
	CREW	<p>Instruction 8</p> <p>Determine that Containment Isolation acceptance criteria are met by the following:</p> <ol style="list-style-type: none"> Check that Containment pressure is <2.5 psig REFER TO Appendix 7, List of EOP Radiation Monitors and check BOTH of the following conditions: <ul style="list-style-type: none"> No valid containment area radiation monitor alarms or unexplained rise in activity No valid steam plant activity monitor alarms or unexplained rise in activity <p>Expected Action: RO/BOP observes that Containment pressure is <i>greater than</i> 2.5 psig. BOP reports activity in Containment.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Contingency Action 8.a.1</p> <p>IF containment pressure is 3 psig or more, THEN ensure that CIAS has been initiated.</p> <p>Expected Action: RO ensures that CIAS has been initiated by observing red annunciator RKN-UA-2A 05C (CIAS) and observing that the initiation relay lights on B05 are NOT lit.</p>
	CREW	<p>Instruction 9</p> <p>Determine that Containment Temperature, Pressure, and Combustible Gas Control acceptance criteria are met by the following:</p> <ul style="list-style-type: none"> a. Check that containment temperature is <117°F b. Check that containment pressure is <2.5 psig <p>Expected Action: RO reports that Containment temperature is greater than 117°F and that Containment pressure is greater than 2.5 psig.</p>
	CRS/RO	<p>Contingency Action 9.b.1</p> <p>IF containment pressure is 3 psig or more, THEN ensure that CIAS has been initiated.</p> <p>Expected Action: RO ensures that CIAS has been initiated by observing red annunciator RKN-UA-5C 02A (CIAS) and observing that the initiation relay lights on B05 are NOT lit.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Contingency Action 9.b.2</p> <p>IF containment pressure is 8.5 psig or more, THEN perform the following:</p> <ol style="list-style-type: none"> 1) Ensure CSAS is actuated. 2) Ensure at least one Containment Spray header flow is greater than 4350 gpm. 3) Stop all of the operating RCPs. 4) Ensure RCP controlled bleedoff flow is isolated. <p>Expected Action: Containment pressure may be less than 8.5 psig at this time. If containment pressure exceeds 8.5 psig, the RO ensures CSAS is actuated by observing the red annunciator RKN-UA-5C 04A, CSAS. RO verifies CS Header flow on SIA-FI-338 and SIB-FI-348. RO isolates RCP controlled bleedoff flow by shutting individual RCP bleedoff valves or by closing the either of the common bleedoff isolation valves (CHB-UV-505, CHA-UV-506, and CHA-UV-507).</p>
	CRS	<p>Instruction 10</p> <p>IF all acceptance criteria are met, AND no contingency actions were performed, THEN GO TO 40EP-9EO02, Reactor Trip.</p> <p>Expected Action: CRS determines that several contingency actions were taken.</p>
	CRS	<p>Instruction 11.</p> <p>IF any acceptance criteria are NOT met, OR ANY contingency action was taken, THEN GO TO Section 4.0, Diagnostic Actions to diagnose the event.</p> <p>Expected Action: CRS Determines that that there is a LOCA in progress and then transitions to 40EP-9EO03, Loss of Coolant Accident.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
40EP-9EO03, Loss of Coolant Accident		

		<p style="text-align: center;">NOTE</p> <p>Harsh conditions are containment temperature greater than 170°F or containment radiation level greater than 108 mR/hr. Harsh containment values are placed in brackets next to the normal setpoint or band</p> <p>Expected Action: CRS announces that harsh conditions apply.</p>
	CRS	<p>Instruction 1</p> <p>Confirm the diagnosis of a Loss of Coolant Accident by performing the following:</p> <ul style="list-style-type: none"> a. Check that the Safety Function Status Check acceptance criteria are satisfied. b. Ensure that the Steam Generator Sample Valves are open. c. Direct Chemistry to PERFORM 74DP-9ZZ05, Abnormal Occurrence Checklist. <p>Expected Action: Normally an STA function.</p>
	CRS	<p>Instruction 2</p> <p>Ensure the event is being classified.</p> <p>Expected Action: CRS prompts SM to classify the event.</p>
	CRS	<p>Instruction 3</p> <p>Open the Placekeeper and enter the EOP Entry Time.</p> <p>Expected Action: As directed.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 4</p> <p>IF pressurizer pressure drops to the SIAS setpoint, THEN check that SIAS is actuated.</p> <p>Expected Action: SIAS has already actuated.</p>
	RO	<p>Instruction 5</p> <p>IF SIAS has actuated, THEN perform the following:</p> <ul style="list-style-type: none"> • Check that the HPSI and LPSI Pumps have started. • Check that safety injection flow is adequate. REFER TO Appendix 2, Figures. <p>Expected Action: RO ensures both LPSI Pumps are running and ensures HPSI PUMP "B" has been started.</p>
	CRS	<p>Instruction 6</p> <p>IF SIAS has actuated, THEN perform the following:</p> <p>IF it is determined that RWT level may lower to less than 73% during the event, OR it is desired to align Charging Pump suction through an alternate suction path, THEN PERFORM ONE of the following:</p> <ul style="list-style-type: none"> • Appendix 10, Charging Pump Alternate Suction to the RWT / Restoration • Appendix 11, Charging Pump Alternate Suction to the SFP / Restoration <p>Expected Action: RO performs Appendix 10 or 11. (Likely Appendix 11 if CSAS actuates). RO directs AO to perform Attachment 10-A or 11-A.</p> <p>Examiner Note: CRS may delay this action.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Instruction 7</p> <p>IF pressurizer pressure remains below the SIAS setpoint, THEN perform the following:</p> <ul style="list-style-type: none"> a. Ensure ONE RCP is stopped in each loop. b. IF RCS subcooling is less than 24°F [44°F], THEN ensure all RCPs are stopped. <p>Expected Action: N/A. RCPs already secured.</p>
	CRS	<p>Instruction 8</p> <p>IF ANY RCPs are operating, THEN PERFORM Appendix 16, RCP Trip Criteria and check the RCP operating limits satisfied.</p> <p>Expected Action: N/A. RCPs already secured.</p>
	CRS/BOP	<p>Instruction 9</p> <p>Attempt to isolate the LOCA by performing the following:</p> <ul style="list-style-type: none"> a. Ensure that the letdown line is isolated. b. Ensure that the RCS sample lines are isolated. <p>Expected Action: Letdown is already isolated. BOP ensures RCS sample lines are isolated on B07.</p>
	CRS	<p>Instruction 10</p> <p>IF ANY of the following conditions exist:</p> <ul style="list-style-type: none"> • RU-6, Nuclear Cooling Water Radiation Monitor alarming • An abnormal rise in Nuclear Cooling Water surge tank level... <p>Expected Action: N/A. No leak into NCW.</p>
	CRS	<p>Instruction 11</p> <p>IF LOCA is outside of containment as indicated by ANY of the following:</p> <ul style="list-style-type: none"> • Auxiliary building radiation monitor alarm • Unexplained rise in auxiliary building sump levels... <p>Expected Action: N/A. Leak is <i>inside</i> containment.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
		<p style="text-align: center;">NOTE</p> <p>Hydrogen Analyzers are required to be placed in service within 30 minutes of the LOCA.</p>
	RO	<p>Instruction 12</p> <p>Place the Hydrogen Analyzers in service.</p> <p>Expected Action: RO may refer to 40OP-9HP01, Sections 6.3 and 6.4. RO places analyzers in service by:</p> <ul style="list-style-type: none"> • Open HPA-UV-1, Containment Isolation Valve, using handswitch HPA-HS-1, Control System A Sply Isol Vlv UV-1. • Open HPA-HV-7A/7B Containment Isolation Valves, using handswitch HPA-HS-7, Control System A Anal Isol Vlv HV-7A/7B. • Place hand-switch HPA-HS-9A, Power/Control, in the ANALYZE position. • (repeats process for Analyzer "B")
	CRS	<p>Instruction 13</p> <p>IF containment pressure is 3 psig or more, THEN check CIAS is actuated.</p> <p>Expected Action: CIAS has already actuated.</p>
		<p style="text-align: center;">CAUTION</p> <p>High radiation levels may result in personnel exposure when attempting local manual valve operation.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 14</p> <p>IF CIAS has actuated, THEN perform the following:</p> <p>Check that an isolation valve is closed for each containment penetration required to be closed.</p> <p>Expected Action: RO checks SAFETY EQPT A(B) STATUS TRAIN A (B) SYSTEMS panels for blue lights which indicate CIAS components out of position. None found.</p>
	CRS	<p>Instruction 15</p> <p>IF the following conditions exist:</p> <ul style="list-style-type: none"> • The Containment Spray Pump(s) are operating on the miniflow(s) • Containment pressure is not expected to exceed 8.5 psig within one hour of the CS Pump start <p>THEN stop the Containment Spray Pump(s).</p> <p>Expected Action: N/A. Containment pressure exceeds 8.5 psig.</p>
	RO	<p>Instruction 16</p> <p>IF containment pressure is 8.5 psig or more, THEN check CSAS is actuated.</p> <p>Expected Action: RO checks that the red CSAS light (RKN-UA-5C, 4A) is lit and observes that the initiation relay lights on B05 are NOT lit.</p> <p>Examiner Note: The CRS may direct manual CSAS initiation on trend.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Instruction 17</p> <p>IF CSAS has actuated, THEN perform the following:</p> <ol style="list-style-type: none"> Ensure at least one Containment Spray header flow is greater than 4350 gpm. Ensure all RCPs are off. Ensure RCP controlled bleedoff flow is isolated. PERFORM Appendix 19, Containment Hydrogen Control, to align the Hydrogen recombiners. <p>Expected Action: RO ensures both Containment Spray Pumps are running, and header flow is greater than 4350 gpm.</p>
	RO	<p>Instruction 18</p> <p>IF both CS pumps are operating AND BOTH of the following conditions are met:</p> <ul style="list-style-type: none"> Containment pressure is less than 50 psig and not rising Safety injection is actuated and flow is within SI delivery curves. <p>THEN stop one of the Containment Spray Pumps.</p> <p>Expected Action: RO secures 1 CS Pump.</p>
	CRS	<p>Instruction 19</p> <p>IF a Containment Spray Pump was stopped AND the running Containment Spray Pump trips THEN start a Containment Spray Pump.</p> <p>Expected Action: N/A. A CS Pump has NOT tripped.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Instruction 20</p> <p>IF SIAS has actuated, THEN perform the following:</p> <ol style="list-style-type: none"> Energize the SIAS Load Shed Panels. REFER TO Appendix 21, List of SIAS Load Shed Panels. IF containment level is NOT indicated, THEN PERFORM Appendix 17, Restoration of Containment Cooling. <p>Expected Action: RO/CRS/BOP directs an AO to energize SIAS Load Shed Panels (perform Appendix 21). BOP performs Appendix 17</p>
	CRS	<p>Instruction 21</p> <p>IF ALL of the following conditions exist:</p> <ul style="list-style-type: none"> The Containment Spray Pump(s) are operating Containment pressure is less than 5 psig and stable or lowering The TSC has determined that Containment Spray is NOT required for iodine removal CS pumps are NOT required for long term cooling... <p>Expected Action: N/A. CS Pumps are still required for Iodine removal.</p>
	CRS	<p>Instruction 22</p> <p>IF a LOOP has occurred, THEN actuate MSIS.</p> <p>Expected Action: N/A. MSIS already actuated.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Instruction 23</p> <p>IF BOTH of the following conditions exist:</p> <ul style="list-style-type: none"> • MSIS has actuated • Condenser Reheat Tray level is in the indicating range locally (CDN-LG-88 & 89) <p>THEN override and open BOTH of the following:</p> <ul style="list-style-type: none"> • SGA-HS-1133, Steam Trap SGNM23 Inlet Isolation Valve UV-1133 • SGA-HS-1134, Steam Trap SGNM24 Inlet Isolation Valve UV-1134 <p>Expected Action: BOP directs AO to check Condenser Reheat Tray levels. BOP overrides and closes UV-1133 & UV-1134.</p> <p>AO Report: Condenser Reheat Tray levels are normal.</p>
	CRS	<p>Instruction 24</p> <p>IF BOTH of the following conditions exist:</p> <ul style="list-style-type: none"> • ANY SIT vent valve is known to be failed closed and can NOT be opened • The associated SIT Outlet Valve is powered from the opposite train AND ALL of the following conditions exist:... <p>Expected Action: N/A. No SIT valves are failed closed.</p>
	CRS	<p>Instruction 25</p> <p>IF the LOCA has been isolated, THEN GO TO step 77.</p> <p>Expected Action: N/A. LOCA is NOT isolated.</p>

Op-Test No.: **2015 NRC** Scenario No.: **3** Event No.: **7, 8, & 9**

Event Description: **Pressurizer Steam Space LOCA**

Time	Position	Applicant's Actions or Behavior
	RO/BOP	<p>Instruction 26</p> <p>Perform the following:</p> <ul style="list-style-type: none">a. PERFORM Appendix 5, RCS and PZR Cooldown Log.b. Cooldown the Steam Generators using the SBCS. <p>Expected Action: RO initiates Appendix 5. BOP determines SBCS cannot be used due to loss of NNN-D11.</p>
	BOP	<p>CONTINGENCY ACTION 26.b.1</p> <p>Cooldown the Steam Generators using the ADVs by ONE of the following:</p> <ul style="list-style-type: none">• Operation from the Control Room• Appendix 18, Local ADV Operation <p>Expected Action: BOP uses manual thumbwheel on ADVs to establish a cooldown.</p>
<p>Examiner Note: Scenario may be terminated upon transition to cooldown and after CRS briefs the crew, OR at the discretion of the Lead Examiner.</p>		

Facility: PVNGS		Date of Exam: April, 2015		Operating Test No.:													
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P		R	I	U
RO R1, R2, R5, R6, R9	RX												0	1	1	0	
	NOR			1		1							2	1	1	1	
	I/C			4,5		2,4, 6							5	4	4	2	
	MAJ			6,8		5							4	2	2	1	
	TS												0	0	2	2	
RO R3, R4, R7, R8, R10, R11	RX												0	1	1	0	
	NOR									1			1	1	1	1	
	I/C		2,3,4, 7			3,4,6,7			3,5, 6,8				8	4	4	2	
	MAJ		6,8			5			7				3	2	2	1	
	TS												0	0	2	2	
SRO-I I1, I3, I4, I5, I7, I8,	RX												0	1	1	0	
	NOR				1								1	1	1	1	
	I/C				2,3,4, 6,7				2,4,6, 9				9	4	4	2	
	MAJ				5				7				2	2	2	1	
	TS				2,4								2	0	2	2	
SRO-I I1, I3, I4, I5, I7, I9	RX												0	1	1	0	
	NOR	1											1	1	1	1	
	I/C	2,3,4, 5,7											5	4	4	2	
	MAJ	6											1	2	2	1	
	TS	4,5											2	0	2	2	
SRO-I I2, I6, I9	RX												0	1	1	0	
	NOR					1			1				2	1	1	1	
	I/C					2,4, 6			2,3,4, 5,6,8				9	4	4	2	
	MAJ					5			7				2	2	2	1	
	TS								2,3,6				2	0	2	2	

Facility:		PVNGS			Date of Exam: April, 2015						Operating Test No.:						
A P P L I C A N T	E V E N T T Y P E	Scenarios															
		1			2			3			4			T O T A L	M I N I M U M (*)		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
																	R
SRO-I I2	RX													0	1	1	0
	NOR			1										1	1	1	1
	I/C			4,5										2	4	4	2
	MAJ			6,8										2	2	2	1
	TS													0	0	2	2
SRO-U U2, U4	RX													0	1	1	0
	NOR													0	1	1	1
	I/C						3,4,6,7							4	4	4	2
	MAJ						5							1	2	2	1
	TS													0	0	2	2
SRO-U U1, U3	RX													0	1	1	0
	NOR				1									1	1	1	1
	I/C				2,3,4,6,7									5	4	4	2
	MAJ				5									1	2	2	1
	TS				2,4									2	0	2	2
SRO-U U1, U2, U4	RX													0	1	1	0
	NOR							1						1	1	1	1
	I/C							2,3,4,5,6,8,9						6	4	4	2
	MAJ							7						1	2	2	1
	TS							2,3,6						3	0	2	2

Facility: PVNGS		Date of Exam: April, 2015									Operating Test No.:						
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
		R	I	U													
<p>Instructions:</p> <ol style="list-style-type: none"> 1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO <i>additionally</i> serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position. 2. Reactivity manipulations may be conducted under normal or <i>controlled</i> abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis. 3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns. 																	

Facility: PVNGS		Date of Examination: Apr 13-18, 2015				Operating Test No.:2015						
Competencies	APPLICANTS											
	RO <input checked="" type="checkbox"/> X SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> X SRO-U <input type="checkbox"/>				RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/> X			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4
Interpret/Diagnose Events and Conditions	2,3, 4,5, 6,7, 8,9	2,3, 4,5, 6,7	2,3, 4,5, 6,7, 8,9	1,2, 3,4, 5,6	2,3, 4,5, 6,7, 8,9	2,3, 4,5, 6,7	2,3, 4,5, 6,7, 8,9	1,2, 3,4, 5,6	2,3, 4,5, 6,7, 8,9	2,3, 4,5, 6,7	2,3, 4,5, 6,7, 8,9	1,2, 3,4, 5,6
Comply With and Use Procedures (1)	1,2, 3,4, 5,6, 9	1,2, 3,4, 5,6, 7	1,2, 3,4, 5,6, 8,9	1,2, 3,4, 5,6	2,3, 4,5, 6,7, 8,9	1,3, 4,5, 6,7	2,3, 4,5, 6,8, 9	1,2, 3,4, 5,6	1,2, 5,6, 7,9	1,3, 4,5, 6,7	2,3, 4,5, 6,8, 9	1,2, 3,4, 5,6
Operate Control Boards (2)	1,2, 3,5, 6,7, 8,9	1,2, 3,4, 5,6, 7	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6	2,3, 5,8	1,2, 5,6	2,4, 6,7, 8	1,3, 4,5, 6				
Communicate and Interact	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6, 7	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6, 7	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6, 7	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6
Demonstrate Supervisory Ability (3)					1,2, 3,4, 5,6, 7,8, 9	2,3, 4,5, 6,7	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6	1,2, 3,4, 5,6, 7,8, 9	2,3, 4,5, 6,7	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6
Comply With and Use Tech. Specs. (3)					4,6	2,4	2,5, 6	1,3, 4	4,6	2,4	2,5, 6	1,3, 4
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.												

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.