NRC JPM RO EC

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE
(RO)

TITLE: **Identify the tagging/clearance points for a shaft seal replacement on the "E" RBCCW pump**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**30**	Actual Time (min):	
PERFORMANCE TIME:	Average Time (min):		Actual Time (min):	

JPM RESULTS: SAT UNSAT
(Circle one)

COMMENT SHEET ATTACHED:

SYNOPSIS: Candidate must use plant documents to determine the blocking points for a shaft seal replacement on the "E" RBCCW pump, then determine the position of the blocking point and the type of clearance tag required.

TASK STANDARD: Identify the blocking points, position, and tag type for a clearance for a shaft seal replacement on the "E" RBCCW pump

EVALUATION METHOD:

x Perform
Simulate

EVALUATION LOCATION:

Plant
x Simulator/Classroom
Control Room

Prepared: Tom Hooper **Date:** 08/24/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training
(or Designee)

TASK Title:	Task Number	K&A:	K&A RATING:
CONDUCT EQUIPMENT TAGOUTS CLEARANCE AND SWITCHING.	299-03-01-012	2.2.13, Knowledge of tagging and clearance procedures.	RO 4.1 SRO 4.3

REFERENCES:

P&ID M-215, Sheet 2
EN-OP-102-02, Fleet Tagging Assessments
EN-OP-102, Protective and Caution Tagging
PNPS 2.2.30, Reactor Building Closed Cooling Water (RBCCW) System

SIMULATOR CONDITIONS: None

None

GENERAL TOOLS AND EQUIPMENT:

Ensure RBCCW P&IDs, PNPS 2.2.30, and EN-OP-102 are available

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

INITIAL CONDITIONS:

The plant is at rated power. A tagout/clearance is required for maintenance work to replace the mechanical shaft seal on the "E" RBCCW pump.

INITIATING CUE:

Identify the components required to be tagged, the type of tags and the position of clearance points required for a shaft seal replacement on the "E" RBCCW pump. Record your findings on the provided handout.

PERFORMANCE:

START TIME: _____

1.	**Procedure Step:**	Reference P&ID M-215,
	Standard	Candidate determines correct P&ID and reviews it to determine the blocking points for the E RBCCW Pump.
	Comments	
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	Identifies isolations necessary to replace the seal on the E RBCCW Pump From EN-OP-102 and P&ID M-215, Using controlled documents, determine hazardous energy sources and isolations necessary to provide a safe work boundary for each work activity.
	Standard	See attached key
	Comments	
	Results	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	Identifies valves necessary to open to replace the seal on the E RBCCW Pump [1] From EN-OP-102: Isolation Boundaries — Those components (isolation valves, vents, drains, electrical breakers, fuses, and/or switches, for example) that are required to be positioned to provide equipment protection and personnel safety during work activity/procedural performance. One vent or drain should normally be Danger Tagged open to depressurize systems and to prevent it from re-pressurizing.
	Standard	See attached key
	Comments	
	Results	SAT ☐ UNSAT ☐

4.	Procedure Step:	Identifies the type of tags required to replace the seal on the E RBCCW Pump
	Standard	See attached key
	Comments	
	Results	SAT ☐ UNSAT ☐

Terminating Cue: **ONCE candidate discusses their findings the JPM can be terminated**

KEY

Component	Tag Type	Position
1. RBCCW Pump E Suction Valve 30-HO-46	Danger	Closed
2. RBCCW Pump E Discharge Valve 30-HO-49	Danger	Closed
3. RBCCW Pump E Discharge PI-4004 Root Valve 30-HO-240E Re-write (3) and (4) to make any one vent path enough (discharge PI, casing vent, suction PI – 30-HO-237E)?	Caution	Open/Close as necessary to vent/drain
4. RBCCW Pump E Discharge Casing Vent Valve 30-HO-52	Danger	Open
5. RBCCW Pump E (P-202E) Power Supply AUX BAY B-3	Danger	Off/Removed
6. RBCCW Pump E (P-202E) Control Switch	Danger or Caution	Pull To Lock

STOP TIME: _____

HANDOUT

Component	Tag Type	Position

INITIAL CONDITIONS:

The plant is at rated power. A tagout/clearance is required for maintenance work to replace the mechanical shaft seal on the "E" RBCCW pump

INITIATING CUE:

Identify the components required to be tagged, the type of tags and the position of clearance points required for a shaft seal replacement on the "E" RBCCW pump. Record your findings on the provided handout.

NRC JPM SRO EC

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE
(SRO)

TITLE: **Review Proposed Isolation Boundary for "E" RBCCW Pump Shaft Seal Replacement and Determine Technical Specification Impact**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**30**	Actual Time (min):	
PERFORMANCE TIME:	Average Time (min):		Actual Time (min):	

JPM RESULTS: SAT UNSAT
(Circle one)

COMMENT SHEET ATTACHED:

SYNOPSIS: Candidate must use plant documents to determine the blocking points for a shaft seal replacement on the "E" RBCCW pump, then determine the position of the blocking point and the type of clearance tag required. This will be compared to a proposed list of blocking points, and the discrepancies must be noted. The candidate will also determine the Technical Specification impact of RBCCW pump(s) being out of service.

TASK STANDARD: Identify discrepancies in a proposed isolation boundary for a shaft seal replacement on the "E" RBCCW pump. Determine the Technical Specification impact of RBCCW pump(s) being out of service.

EVALUATION METHOD:

x Perform
Simulate

EVALUATION LOCATION:

Plant
x Simulator/Classroom
Control Room

Prepared: Tom Hooper **Date:** 08/24/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training
(or Designee)

TASK Title:	Task Number	K&A:	K&A RATING:
CONDUCT EQUIPMENT TAGOUTS CLEARANCE AND SWITCHING.	299-03-01-012	2.2.13, Knowledge of tagging and clearance procedures.	RO 4.1 SRO 4.3

REFERENCES:

P&ID M-215, Sheet 2
EN-OP-102-02, Fleet Tagging Assessments
EN-OP-102, Protective and Caution Tagging
PNPS 2.2.30, Reactor Building Closed Cooling Water (RBCCW) System

SIMULATOR CONDITIONS: None

None

GENERAL TOOLS AND EQUIPMENT:

Ensure RBCCW P&IDs, PNPS 2.2.30, and EN-OP-102 are available

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

INITIAL CONDITIONS:

The plant is at rated power. A tagout/clearance is required for maintenance work to replace the mechanical shaft seal on the "E" RBCCW pump. A proposed isolation boundary for this work has been developed.

INITIATING CUE:

Review the proposed isolation boundary for a shaft seal replacement on the "E" RBCCW pump. Record your findings in the space below. Additionally, answer the provided worksheet questions regarding the Technical Specification implications of isolating the "E" RBCCW pump.

PERFORMANCE:

START TIME: _____

1.	**Procedure Step:**	Reference P&ID M-215.
	Standard	Candidate determines correct P&ID and reviews it to determine the blocking points for the "E" RBCCW Pump.
	Comments	
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	Identifies missing suction isolation.
	Standard	Identifies RBCCW Pump E Suction Valve 30-HO-46 should be danger tagged closed.
	Comments	
	Results	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	Identifies missing electrical isolation.
	Standard	Identifies the "E" RBCCW pump breaker (RBCCW Pump E (P-202E) Power Supply AUX BAY B-3, or similar) should be danger tagged in the racked out or removed position (or similar terminology).
	Comments	
	Results	SAT ☐ UNSAT ☐

4.	**Procedure Step:**	Identifies incorrect casing vent valve.
	Standard:	Identifies that the listed casing vent valve is for "D" RBCCW pump and should instead be for "E" RBCCW pump (30-HO-52 instead of 30-HO-51).
	Comments:	
	Results:	SAT ☐ UNSAT ☐

5.	**Procedure Step:**	Answers Technical Specification worksheet question #1.
	Standard:	See attached key.
	Comments:	
	Results:	SAT ☐ UNSAT ☐

6.	**Procedure Step:**	Answers Technical Specification worksheet question #2.
	Standard:	See attached key.
	Comments:	
	Results:	SAT ☐ UNSAT ☐

Terminating Cue: **ONCE candidate discusses their findings the JPM can be terminated**

STOP TIME: _____

Technical Specification Question Worksheet KEY

Question #1: What are the Technical Specification implications once the "E" RBCCW pump is made inoperable?

Technical Specification 3.5.B.3 is still satisfied (no active LCO entry required) because only two RBCCW pumps are required to be operable in each loop ("D" and "F" are still operable in loop "B") (or similar) (may also discuss tracking LCO for "E" RBCCW pump).

Question #2: Once the "E" RBCCW pump is made inoperable, what would be the Technical Specification implications if the "F" RBCCW pump also becomes inoperable?

Technical Specification 3.5.B.3 LCO entry is required (restore one of the inoperable RBCCW pumps to operable status within 7 days) (or similar).

Proposed Isolation Boundary

Component	Tag Type	Position
RBCCW Pump E Discharge Valve 30-HO-49	Danger	Closed
RBCCW Pump E Discharge PI-4004 Root Valve 30-HO-240E	Caution	Open/Close as necessary to vent/drain
RBCCW Pump E Casing Vent Valve 30-HO-51	Danger	Open
RBCCW Pump E (P-202E) Control Switch	Danger	Pull To Lock

Technical Specification Question Worksheet

Question #1: What are the Technical Specification implications once the "E" RBCCW pump is made inoperable?

Question #2: Once the "E" RBCCW pump is made inoperable, what would be the Technical Specification implications if the "F" RBCCW pump also becomes inoperable?

INITIAL CONDITIONS:

The plant is at rated power.

A tagout/clearance is required for maintenance work to replace the mechanical shaft seal on the "E" RBCCW pump.

A proposed isolation boundary for this work has been developed.

INITIATING CUE:

Review the proposed isolation boundary for a shaft seal replacement on the "E" RBCCW pump.

Record your findings in the space below.

Additionally, answer the provided worksheet questions regarding the Technical Specification implications of isolating the "E" RBCCW pump.

NRC JPM S/RO COO1

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE
(RO/SRO)

TITLE: **Work Hour Restrictions**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	**20 / 25**	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The operator will be told that the plant is at 100% power and that a Reactor Operator has called out sick for an upcoming day shift. The operator will be given the work hour history for three Reactor Operators and asked to determine which operator(s) can take the watch and why/why not. Additionally, SROs will be asked about the actions required to allow a Reactor Operator to take the watch if they have exceeded work hour limits.

TASK STANDARD: The operator will determine that one of the three Reactor Operators cannot cover the proposed shift without exceeding work hour limits. The operator will explain the reason this Reactor Operator is ineligible. SROs will additionally determine the required actions for allow this Reactor Operator to take the shift if necessary for minimum manning. The procedure shall be followed without failure of critical elements.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
Simulator
X Classroom

Prepared: Tom Hooper **Date:** 08/23/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number	Date	Description
0	08/23/16	New JPM for 2016 NRC exam.

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
		Generic	2.1.5 (2.9/3.9)

REFERENCES:

1. EN-OM-123, Fatigue Management Program

SIMULATOR CONDITIONS:

NA

GENERAL TOOLS AND EQUIPMENT:

Calculator

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin."
2. **Provide Candidate with JPM Cue Sheet # 1 (Last Page of this JPM).**
3. The task conditions are as follows:
   a) The plant is at 100% power.
   b) A Reactor Operator has called out sick for Friday, April 14th Day Shift.
   c) The following is the recent work hour history and upcoming schedule for three Reactor Operators. Their hours worked were and are in the Main Control Room during Mode 1, except for the training week.

Dayshift	6:00 am – 6:00 pm
Nightshift	6:00 pm – 6:00 am
Training	6:30 am – 3:30 pm

   d) The schedules show the day that each work shift begins.

RO – Joe Thompson	M	T	W	Th	F	Sa	Su
Week of March 20	D	D	D	D			
Week of March 27	T	T	T	T		N	N
Week of April 3	N	N	N			D	D
Week of April 10	D	D	D		D?		
Week of April 17		N	N	N			

RO – Dan Lane	M	T	W	Th	F	Sa	Su
Week of March 20	D	D	D	D		N	N
Week of March 27	N	N				D	D
Week of April 3	D					D	D
Week of April 10	D	T	T	T	D?		
Week of April 17	N	N	N				

RO – Tony Holmes	M	T	W	Th	F	Sa	Su
Week of March 20	D	D	D	D			
Week of March 27	T	T	T	T		D	D
Week of April 3	D						N
Week of April 10	N	N	N	N	D?		
Week of April 17		N	N	N			

4. Solicit and answer any questions the operator may have.

INITIATING CUE:

Evaluate the work hour history for each of the three Reactor Operators. Determine which operators can take the scheduled watch for a full dayshift of 12 hours today, Friday, April 14 (and still be eligible for future scheduled shifts).

If applicable, describe the conditions that would make any operator(s) ineligible to work.

Consider all days after April 14 as scheduled shifts. Consider all days before April 14 as actual worked shifts.

Record your findings on the provided worksheet.

(Gray shaded denotes Critical Steps)

START TIME: _____

1.	**Procedure Step:**	Obtain a controlled copy of EN-OM-123.
	Standard	Obtains a controlled copy of EN-OM-123.
	Cue	
	Notes	Verify working copies of EN-OM-123 are available.
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	[1] Work hour limits for individuals performing Covered Work consist of three concurrent components: maximum ceilings, minimum breaks, and minimum days off (MDO). [2] The maximum ceilings which apply at all times are a maximum of: (a) 16 work hours in any 24-hour period, (b) 26 work hours in any 48-hour period, and (c) 72 work hours in any 7-day period. [3] The minimum break times which apply at all times are a minimum of: (a) 10-hour break between successive work periods, except that an 8-hour break is allowed when necessary to accommodate a crew's scheduled transition between work schedules or shifts, and (b) 34-hour break in any 9-day period. [4] The MDO that applies when the plant is on-line: • 54-hour rolling average
	Standard	Reviews limitations of EN-OM-123.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

3.		
	Procedure Step:	Evaluate Joe Thompson for overtime.
	Standard	Determines Joe Thompson can work the shift.
	Cue	
	Notes	The candidate must indicate that Joe Thompson is eligible, but does not need to provide an explanation. See attached key for example.
	Results	SAT ☐ UNSAT ☐

4.		
	Procedure Step:	Evaluate Dan Lane for overtime.
	Standard	Determines Dan Lane can NOT take the shift because he would exceed the 72 hours in a 7 day period.
	Cue	
	Notes	The candidate must indicate why Dan Lane is not eligible, but does not have to match the above description exactly. See attached key for example.
	Results	SAT ☐ UNSAT ☐

5.		
	Procedure Step:	Evaluate Tony Holmes for overtime.
	Standard	Determines Tony Holmes can NOT take the shift because he would exceed 16 hours in a 24 hour period OR would not have at least a 10 hour break between successive work periods.
	Cue	
	Notes	The candidate must indicate that Tony Holmes is not eligible, but does not need to provide an explanation. See attached key for example.
	Results	SAT ☐ UNSAT ☐

Evaluator: Terminate the task at this point for RO Candidates. Provide SRO Candidates with the additional SRO Only Handout once they have completed the above section.

Additional SRO Only Information:

- Joe Thompson and Tony Holmes can NOT be reached.
- Dan Lane is the only operator available and will be required to work in order to comply with Technical Specification minimum manning.

Additional SRO Only Cue:
Inform the Candidate, "Determine the required actions to allow Dan Lane to cover the day shift on April 14. Document your findings in the space below."

6.	Procedure Step:	SRO Only Determine the required actions to allow Dan Lane to cover the shift.
	Standard	Determines EN-OM-123 requires the following actions to allow Dan Lane to cover the shift: • Must complete EN-OM-123 Attachment 9.7, Waiver Basis and Approval • Must complete EN-OM-123 Attachment 9.8, Covered Worker Capability Assessment
	Cue	
	Notes	The candidate may list individual requirements vice listing Attachment numbers. Reference the EVALUATOR ATTACHMENT at the end of this JPM to see the requirements of EN-OM-123 Attachments 9.7 and 9.8.
	Results	SAT ☐ UNSAT ☐

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

EVALUATOR'S KEY

Initial Conditions:

a) The plant is at 100% power.

b) A Reactor Operator has called out sick for Friday, April 14th Day Shift.

c) The following is the recent work hour history and upcoming schedule for three Reactor Operators. Their hours worked were and are in the Main Control Room during Mode 1, except for the training week.

Dayshift	6:00 am – 6:00 pm
Nightshift	6:00 pm – 6:00 am
Training	6:30 am – 3:30 pm

d) The schedules show the day that each work shift begins.

RO – Joe Thompson	M	T	W	Th	F	Sa	Su
Week of March 20	D	D	D	D			
Week of March 27	T	T	T	T		N	N
Week of April 3	N	N	N			D	D
Week of April 10	D	D	D		D?		
Week of April 17		N	N	N			

RO – Dan Lane	M	T	W	Th	F	Sa	Su
Week of March 20	D	D	D	D		N	N
Week of March 27	N	N				D	D
Week of April 3	D					D	D
Week of April 10	D	T	T	T	D?		
Week of April 17	N	N	N				

RO – Tony Holmes	M	T	W	Th	F	Sa	Su
Week of March 20	D	D	D	D			
Week of March 27	T	T	T	T		D	D
Week of April 3	D						N
Week of April 10	N	N	N	N	D?		
Week of April 17		N	N	N			

Initiating Cue:

Evaluate the work hour history for each of the three Reactor Operators. Determine which operators can take the scheduled watch for a full dayshift of 12 hours today, Friday, April 14 (and still be eligible for future scheduled shifts).

If applicable, describe the conditions that would make any operator(s) ineligible to work.

Consider all days after April 14 as scheduled shifts. Consider all days before April 14 as actual worked shifts.

Record your findings on the provided worksheet.

Reactor Operator	Eligible for Day Shift on April 14th? (circle Yes or No)	If not eligible, describe reason:
Joe Thompson	**Yes / No**	
Dan Lane	**Yes / No**	
Tony Holmes	**Yes / No**	

Reactor Operator	Eligible for Day Shift on April 14? (circle Yes or No)	If not eligible, describe reason:
Joe Thompson	(Yes) / No	
Dan Lane	Yes / (No)	Exceeds 72 hours in a 7 day period (or similar)
Tony Holmes	Yes / (No)	Exceeds 16 hours in a 24 hour period (or similar) and/or Does not have at least a 10 hour break between successive work periods (or similar)

EVALUATOR'S KEY

EVALUATOR'S ATTACHMENT

Entergy	NUCLEAR MANAGEMENT MANUAL	NON-QUALITY RELATED	EN-OM-123	REV 12
		INFORMATIONAL USE	PAGE 56 OF 60	
Fatigue Management Program				

ATTACHMENT 9.7 WAIVER BASIS AND APPROVAL
Sheet 1 of 2

REFER TO PROCEDURE SECTION 5.9

A. ADVERSE CONDITION REQUIRING A WAIVER:
(Check applicable box and describe circumstances that necessitate use of a waiver (5.9[2]))

☐ Necessary to mitigate or prevent a condition adverse to safety [Definition 3.0.8]
- ☐ Public or station personnel health or safety is jeopardized.
- ☐ Recovery from a challenge to the safety function of a system or component is delayed.
- ☐ Compliance with another NRC regulatory requirement is impaired or prevented.
- ☐ Mitigation of a Technical Specification required reactor shutdown or power reduction is impaired or prevented.
- ☐ Unplanned increase in the plant status risk color assignment.
- ☐ Compliance with site environmental permits is impaired or prevented.
- ☐ External events (weather, fire, flooding) pose a risk to station personnel.

Describe circumstances and basis for approval: _____

_____

_____

Manager, Shift Operations: _____ Date / Time: _____

☐ Necessary for site security [Definition 3.0.8]
- ☐ Compliance with the site security plan is impaired or prevented.
- ☐ Failure to implement a compensatory measure creates a condition adverse to safety.

Describe circumstances and basis for approval: _____

_____

_____

Supervisor, Security Shift Operations: _____ Date / Time: _____

B. SCOPE OF WORK (brief description of work to be performed under this waiver)

_____

_____

_____

Completed by: _____

C. AUTHORIZATION
Use of waiver is approved for the following time period: (not to exceed 14 calendar days)

Effective Date / time: _____ Expiration Date / time: _____

Approved: _____
(SVP or GMPO)

Entergy	NUCLEAR MANAGEMENT MANUAL	NON-QUALITY RELATED	EN-OM-123	REV 12
		INFORMATIONAL USE	PAGE 57 OF 60	
Fatigue Management Program				

ATTACHMENT 9.7 WAIVER BASIS AND APPROVAL
Sheet 2 of 2

D. CONDITION REPORTING
- Initiate a Condition Report for use of a waiver.
- Attach this approved Form in the Condition Description.
- Proceed to Attachment 9.8 for assessment(s) of individual(s) working under this waiver.

The purpose of this CR is to document corrective actions that may be needed to address why there was insufficient margin in staffing or work schedules to address the unexpected situation without the use of waivers. The evaluation of the condition adverse to safety or security, described in Section A, would be the subject of a separate CR, if required, based on other applicable procedures.

EVALUATOR'S ATTACHMENT

EVALUATOR'S ATTACHMENT

Entergy	NUCLEAR MANAGEMENT MANUAL	NON-QUALITY RELATED	EN-OM-123	REV 12
		INFORMATIONAL USE	PAGE 56 OF 60	
Fatigue Management Program				

ATTACHMENT 9.8 — **COVERED WORKER CAPABILITY ASSESSMENT**

Sheet 1 of 3

REFER TO PROCEDURE SECTION 5.0

A. CR Number: _____ (from Step 5.8 [7][I])

NOTE
A separate Face-to-Face assessment and Attachment 9.8 is required for each individual and for each work period (shift) during which that individual will exceed the work hour limits under the approved waiver. Use the same CR reference numbers on all Attachments 9.8 associated with the approved Attachment 9.7.

B. Covered Worker being assessed (print Name): _____ (Dept):_____

Supervisor performing assessment (print Name): _____ (Dept):_____

Limit(s) that will be exceeded for this work period (check all that apply)

- ☐ > 16 work hours in any 24-hour period
- ☐ > 26 work hours in any 48-hour period
- ☐ > 72 work hours in any 7-day period
- ☐ < 10-hour (consecutive hours) break between successive work periods
- ☐ < 34-hour (consecutive hours) break in any 9-day period
- ☐ 54-hour Rolling Average
- ☐ Minimum Day Off – Outage

Date / time that limit will be exceeded: (Date):_____ (Time): _____
(Determined manually if not in a PQ&S Report)
(If more than one limit will be exceeded in the current work period, record the earliest time)

NOTE
A Face-to-Face assessment of the Covered Worker must be performed during the 4-hour window before the Covered Worker will begin performing covered work under the waiver.

Task to be performed by Covered Worker: _____

_____

C. **Face-to-Face Capability Assessment** (Supervisor record information based on discussion with Covered Worker)

C1. 14-day work history for the Covered Worker: (In the following Table DAY 1 means today, DAY 2 means yesterday, etc. Data may also be provided by attaching a printout from PQ&S in lieu of completing the Table)

DAY	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Shift schedule [a]														
Hours worked [b]														

(a) Indicate 'D' for a day-shift schedule and 'N' for a night shift schedule
(b) Approximate work hours each day

EVALUATOR'S ATTACHMENT

EVALUATOR'S ATTACHMENT

Entergy	NUCLEAR MANAGEMENT MANUAL	NON-QUALITY RELATED	EN-OM-123	REV 12
		INFORMATIONAL USE	PAGE 59 OF 60	
Fatigue Management Program				

ATTACHMENT 9.8 **COVERED WORKER CAPABILITY ASSESSMENT**
Sheet 2 of 3

C2. Have you had a break of at least 10 hours between successive work periods for each of the past 14 days?
☐ Yes ☐ No

C3. Has your schedule exceed work hour limits during another work period / shift in the past 14 days:
☐ Yes ☐ No

C4. Approximately how many hours have you been awake? _____

C5. Approximately how many hours of sleep have you had in the last 24 hours? _____

C6. Approximately how many hours of sleep have you averaged in the past 5 days? _____

C7. Is your current shift schedule affecting your normal sleep routine? ☐ Yes ☐ No

C8. Are you aware of any medical conditions or other non-work circumstances affecting your level of alertness at work? ☐ Yes ☐ No (If yes, discuss with Supervisor performing assessment)

C9. Do you feel capable of performing the assigned task during the work period that exceeds work hour limits without impairment due to fatigue? ☐ Yes ☐ No

D. **Supervisor Conclusions**

D1. Covered Worker participated in the Capability Assessment? ☐ Yes ☐ No

D2. Covered Worker exhibited symptoms of fatigue? ☐ Yes ☐ No
☐ Excessive yawning ☐ Frequent blinking ☐ Red eyes
☐ Difficulty concentrating ☐ Irritability ☐ Other _____

D3. Based on this face-to-face meeting, is there evidence of:

	NO	YES
Acute Fatigue? (potential for inadequate rest in the past 24 – 48 hours)		
Cumulative Fatigue? (potential for inadequate rest over the past 1 – 2 weeks)		
Circadian Rhythm disruptions? (work schedule or non-work activities that may impact the normal daily rhythm for periods of sleep and wakefulness)		
Medical factors that may contribute to fatigue?		
Home or Lifestyle factors that may contribute to fatigue		

D4. There is reasonable assurance that the subject Covered Worker is capable of safely and competently performing the described task during the period that work hour limits will be exceeded: ☐ Yes ☐ No

EVALUATOR'S ATTACHMENT

EVALUATOR'S ATTACHMENT

Entergy	NUCLEAR MANAGEMENT MANUAL	NON-QUALITY RELATED	EN-OM-123	REV 12
		INFORMATIONAL USE	PAGE 60 OF 80	
Fatigue Management Program				

ATTACHMENT 9.8 **COVERED WORKER CAPABILITY ASSESSMENT**
Sheet 3 of 3

D5. Are there any fatigue-related controls, conditions, or counter-measures required for this conclusion:
☐ Yes ☐ No If Yes, describe:_____

_____

Supervisor (signature): _____ Date: _____ Time: _____

Covered Worker (signature): _____ Date: _____ Time: _____

Covered Worker signature indicates that you have participated in the Capability Assessment and that you have provided information to the best of your knowledge. Signature does not indicate agreement with the Supervisor observations or conclusions.

E. DISTRIBUTION

- Attach the completed Form to the PC&S Fatigue Tracking Record (FTR) created for the affected Covered Worker and Work Period. If the Covered Worker will exceed more than one work hour limit during this work period (see Step B), a separate FTR is required for each work hour limit to assure accurate reporting of waiver statistics. However, it is acceptable to attach the completed Form to only one of these FTRs.

AND

- Email the completed Form to the "Fatigue Rule Forms" address in Outlook. Please include site identifier (e.g., 'ANO') in the subject line.

EVALUATOR'S ATTACHMENT

SRO ONLY CUE SHEET #2

- **Joe Thompson and Tony Holmes can NOT be reached.**
- **Dan Lane is the only operator available and will be required to work in order to comply with Technical Specification minimum manning.**

Determine the required actions to allow Dan Lane to cover the Day shift on April 14. Document your findings in the space below.

NRC JPM RO COO2

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE
(RO)

TITLE: **RHR Lineup Verification**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	**15**	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The operator will be told that the plant is at approximately 50% power and that an RHR lineup verification is in progress per PNPS 8.C.43. The operator will complete the lineup verification. The operator will determine a minimum flow valves, a heat exchanger bypass valve, and a Radwaste block valve are out of position.

TASK STANDARD: The operator will complete PNPS 8.C.43 Attachment 1 Section 1. The operator will determine that MO-1001-18A, PUMP MIN FLOW VLV, MO-1001-16A, RHR HX A BYP VLV, and MO-1001-32, RADWASTE BLOCK VLV, are out of position.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
X Simulator
Classroom

Prepared: Tom Hooper **Date:** 09/12/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number	Date	Description
0	09/12/16	New JPM for 2016 NRC exam.

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
		Generic	2.1.29 (4.1)

REFERENCES:

1. 8.C.43, Monthly System Valve Lineup Surveillance

SIMULATOR CONDITIONS:

1. Reset to IC-187
2. Ensure RHR is in a normal standby lineup with the exception of the following:
   a. MO-1001-18A, PUMP MIN FLOW VLV, is closed
   b. MO-1001-16A, RHR HX A BYP VLV, is closed
   c. MO-1001-32, RADWASTE BLOCK VLV, is open

GENERAL TOOLS AND EQUIPMENT:

None

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin."
2. Provide Candidate with JPM cue sheet.
3. The task conditions are as follows:
   a) The plant is at approximately 50% power.
   b) PNPS 8.C.43, Monthly System Valve Lineup Surveillance, is in progress.
   c) The procedure has been prepared up to Attachment 1 Section 1.
4. Solicit and answer any questions the operator may have.

INITIATING CUE:

Perform PNPS 8.C.43, Monthly System Valve Lineup Surveillance, Attachment 1 Section 1.

(Gray shaded denotes Critical Steps)

START TIME: _____

1.	**Procedure Step:**	Completes PNPS 8.C.43 Attachment 1 Section 1.
	Standard	Observes power available and/or normal position for RHR valves by checking light indications (see second-to-last page in JPM for valves).
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	Determines MO-1001-16A, RHR LOOP A HEAT EXCHANGER BYPASS VALVE, is out of position.
	Standard	Observes MO-1001-16A green light on, red light off. Documents and/or reports valve out of position.
	Cue	If asked how to proceed, tell operator to leave valve as found and continue on with the valve lineup.
	Notes	
	Results	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	Determines MO-1001-18A, RHR PUMPS LOOP A MINIMUM FLOW VALVE, is out of position.
	Standard	Observes MO-1001-18A green light on, red light off. Documents and/or reports valve out of position.
	Cue	If asked how to proceed, tell operator to leave valve as found and continue on with the valve lineup.
	Notes	
	Results	SAT ☐ UNSAT ☐

4.	**Procedure Step:**	Determines MO-1001-32, RHR SYSTEM DISCHARGE TO RADWASTE BLOCK VALVE, is out of position.
	Standard	Observes MO-1001-32 green light off, red light on. Documents and/or reports valve out of position.
	Cue	If asked how to proceed, tell operator to leave valve as found and continue on with the valve lineup.
	Notes	
	Results	SAT ☐ UNSAT ☐

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

RESIDUAL HEAT REMOVAL (RHR) SYSTEM

ATTACHMENT 1
Sheet 1 of 4

VALVE CHECKLIST - SECTION 1 (CONTROL ROOM)

VALVE	DESCRIPTION	VALVE LOCATION	P&ID	NORMAL POSITION	POWER AVAILABLE INITIALS	NORMAL POSITION INITIALS	REASON FOR ABNORMAL POSITION
MO-1001-28A	LPCI LOOP A INJECTION THROTTLE VALVE #1	RHR VALVE RM A 23'	M241	OPEN			
MO-1001-29A	LPCI LOOP A INJECTION VALVE #2	RHR VALVE RM A 23'	M241	CLOSED			
MO-1001-47	RHR SHUTDOWN COOLING OUTBOARD ISOLATION VALVE	RHR VALVE RM A 23'	M241	CLOSED	*	*	*
MO-1001-43A	RHR PUMP A SHUTDOWN COOLING SUCTION VALVE	RHR QUAD A 0'	M241	CLOSED			
MO-1001-43C	RHR PUMP C SHUTDOWN COOLING SUCTION VALVE	RHR QUAD A 0'	M241	CLOSED			
MO-1001-7A	RHR PUMP A TORUS SUCTION VALVE	RHR QUAD A -17'	M241	LOCKED OPEN	NOT REQUIRED (PNPS 8.C.13)		
MO-1001-7C	RHR PUMP C TORUS SUCTION VALVE	RHR QUAD A -17'	M241	LOCKED OPEN	NOT REQUIRED (PNPS 8.C.13)		
MO-1001-34A	RHR LOOP A TORUS COOLING/SPRAY BLOCK VALVE	RHR QUAD A -9'	M241	CLOSED			
MO-1001-37A	RHR LOOP A TORUS SPRAY VALVE	RHR QUAD A -9'	M241	CLOSED			
MO-1001-36A	RHR LOOP A TORUS COOLING VALVE	RHR QUAD A -1'	M241	CLOSED			
MO-1001-23A	RHR LOOP A UPPER DRYWELL SPRAY VALVE #1	RWCU HX RM 51'	M241	CLOSED			
MO-1001-26A	RHR LOOP A UPPER DRYWELL SPRAY VALVE #2	RWCU HX RM 51'	M241	CLOSED			
MO-1001-16A	RHR LOOP A HEAT EXCHANGER BYPASS VALVE	RHR QUAD A -3'	M241	OPEN			
MO-1001-18A	RHR PUMPS LOOP A MINIMUM FLOW VALVE	RHR QUAD A -7'	M241	OPEN			

* Breaker 72-961 for MO-1001-47 normal position is OPEN with the valve in the CLOSED position in accordance with PDC98-36. If valve is de-energized and not tagged, then position verification is not required.

RESIDUAL HEAT REMOVAL (RHR) SYSTEM

ATTACHMENT 1
Sheet 2 of 4

VALVE CHECKLIST - SECTION 1 (CONTROL ROOM)

VALVE	DESCRIPTION	VALVE LOCATION	P&ID	NORMAL POSITION	POWER AVAILABLE INITIALS	NORMAL POSITION INITIALS	REASON FOR ABNORMAL POSITION
MO-1001-28B	LPCI LOOP B INJECTION THROTTLE VALVE #1	RHR VALVE RM B 23'	M241	OPEN			
MO-1001-29B	LPCI LOOP B INJECTION VALVE #2	RHR VALVE RM B 23'	M241	CLOSED			
MO-1001-50	RHR SHUTDOWN COOLING INBOARD ISOLATION VALVE	DRYWELL 40'	M241	CLOSED	*	*	*
MO-1001-43B	RHR PUMP B SHUTDOWN COOLING SUCTION VALVE	RHR QUAD B 0'	M241	CLOSED			
MO-1001-43D	RHR PUMP D SHUTDOWN COOLING SUCTION VALVE	RHR QUAD B 0'	M241	CLOSED			
MO-1001-7B	RHR PUMP B TORUS SUCTION VALVE	RHR QUAD B -17'	M241	LOCKED OPEN	NOT REQUIRED (PNPS 8.C.13)		
MO-1001-7D	RHR PUMP D TORUS SUCTION VALVE	RHR QUAD B -17'	M241	LOCKED OPEN	NOT REQUIRED (PNPS 8.C.13)		
MO-1001-34B	RHR LOOP B TORUS COOLING/SPRAY BLOCK VALVE	RHR QUAD B -9'	M241	CLOSED			
MO-1001-36B	RHR LOOP B TORUS COOLING VALVE	RHR QUAD B -9'	M241	CLOSED			
MO-1001-37B	RHR LOOP B TORUS SPRAY VALVE	RHR QUAD B -13'	M241	CLOSED			
MO-1001-23B	RHR LOOP B LOWER DRYWELL SPRAY VALVE #1	TIP ROOM 31'	M241	CLOSED			
MO-1001-26B	RHR LOOP B LOWER DRYWELL SPRAY VALVE #2	TIP ROOM 31'	M241	CLOSED			
MO-1001-16B	RHR LOOP B HEAT EXCHANGER BYPASS VALVE	RHR QUAD B -3'	M241	OPEN			
MO-1001-18B	RHR PUMPS LOOP B MINIMUM FLOW VALVE	RHR QUAD B -7'	M241	OPEN			
MO-1001-19	RHR LOOPS A & B CROSSTIE VALVE	CRD QUAD MEZZ	M241	LOCKED OPEN	NOT REQUIRED (PNPS 8.C.13)		
MO-1001-21	RHR SYSTEM DISCHARGE TO RADWASTE FLOW CONTROL VALVE	CRD QUAD MEZZ	M241	CLOSED	**	**	**
MO-1001-32	RHR SYSTEM DISCHARGE TO RADWASTE BLOCK VALVE	CRD QUAD MEZZ	M241	CLOSED			

* Breaker 52-2046 for MO-1001-50 normal position is OPEN with the valve in the CLOSED position in accordance with PDC98-36. If valve is de-energized and not tagged, then position verification is not required.

** Breaker 72-841 for MO-1001-21 normal position is OPEN with the valve in the CLOSED position in accordance with PDC99-20. If valve is de-energized and not tagged, then position verification is not required.

Initial Conditions:

a) The plant is at approximately 50% power.

b) PNPS 8.C.43, Monthly System Valve Lineup Surveillance, is in progress.

c) The procedure has been prepared up to Attachment 1 Section 1.

Initiating Cue:

Perform PNPS 8.C.43, Monthly System Valve Lineup Surveillance, Attachment 1 Section 1.

Reactor Operator	Eligible for Day Shift on April 14th? (circle Yes or No)	If not eligible, describe reason:
Joe Thompson	**Yes / No**	
Dan Lane	**Yes / No**	
Tony Holmes	**Yes / No**	

NRC JPM SRO COO2

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE (RO/SRO)

TITLE: **Determine Reportability & Actions Associated with a Tech Spec Required Shutdown**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	**20**	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The operator will be told that the plant is at rated power, that an RHR pump was declared inoperable 5 days ago. The operator will also be informed that an Emergency Diesel was just declared inoperable and that it will take at least 36 hours to repair. The operator will be directed to determine what actions are required. After the operator has determined that a 24 hour plant shutdown is required, the operator will be asked the following questions associated with the plant shutdown and to justify their responses using station procedures:

- When the Shutdown must be commenced
- What constitutes "Initiation of a Plant Shutdown"
- Any NRC reportability requirements

TASK STANDARD: The operator will determine that Cold S/D must be achieved within 24 hours and a reactor shutdown must commence within 12 hours; and that the event is a 4-Hour reportable event under 50.72(b)(2)(i). The operator will also determine when the shutdown must commence and what constitutes an initiation of a plant shutdown. The procedure shall be followed without failure of critical elements.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
Simulator
X Classroom

Prepared: Tom Hooper **Date:** 08/23/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number	Date	Description
0	09/10/13	Drafted JPM to reflect most recent procedures for 2014 LOT NRC Exam.
1	01/09/14	Revised following validation
2	02/07/14	Revised following NRC Prep Week
3	08/23/16	Updated for 2017 NRC exam

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
PERFORM REQUIRED NOTIFICATIONS OF ON-SITE AND OFF-SITE PERSONNEL FOR ABNORMAL EVENTS; AND-OR EMERGENCIES IAW 1.3.12.	344-03-02-003	Generic	2.1.2 (4.1/4.4)

REFERENCES:

1. PNPS 1.3.3, Authority to Shut Down and Start Up the Station
2. PNPS 1.3.12, Notification and Recall of Personnel
3. PNPS 1.3.6, Technical Specifications – Adherence and Clarifications
4. Technical Specifications
5. NUREG 1022

SIMULATOR CONDITIONS:

NA

GENERAL TOOLS AND EQUIPMENT:

NA

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin."
2. **Provide Candidate with JPM Cue Sheet # 1 (Last Page of this JPM).**
3. The task conditions are as follows:
   a) The plant is at rated power.
   b) RHR Pump "A" was declared inoperable 5 days ago. The pump is expected to be returned to service in 36 hours.
   c) The "B" EDG has just now also been declared inoperable.
   d) Troubleshooting activities have commenced but it is unknown when the EDG will be returned to service.
   e) All other equipment is operable.
4. Solicit and answer any questions the operator may have.

INITIATING CUE:

1. Determine any Technical Specification actions and NRC notifications required by the EDG issue.
2. When complete, discuss your findings with your evaluator.

(Gray shaded denotes Critical Steps)

START TIME: _____

Evaluator Note: ***Regarding the step below, there are two possible Tech Specs that can be applied that will result in a 24 hour Cold Shutdown requirement. The candidate applying either one will satisfy this critical step.***

The two Tech Spec LCOs are identified below as "24 Hour Cold Shutdown Requirement #1 (2)"

1.	**Procedure Step:**	Assess the EDG inoperability with respect to Technical Specifications.
	Standard	**24 Hour Cold Shutdown Requirement #1:** The operator addresses Technical Specification 3.5.A.4 and determines that: *During Run, Startup, and Hot Shutdown Modes with the LPCI system inoperable, restore the LPCI system to Operable status within 7 days and maintain both core spray systems and the diesel generators Operable. Otherwise, be in at least Cold Shutdown within 24 hours.* Determines that LPCI is inoperable due to the RHR Pump being inoperable. Determines that 3.5.A.4 is not met due to LPCI being inoperable and that the reactor shall be placed in the Cold Shutdown Condition within 24 hours because one diesel is inoperable. **24 Hour Cold Shutdown Requirement #2:** The operator addresses Technical Specification 3.9.B.3 and determines that: *From and after the date that one of the diesel generators or associated emergency bus is made or found to be inoperable for any reason, continued reactor operation is permissible in accordance with Specifications 3.4.B.1, 3.5.F.1, 3.7.B.1.c, 3.7.B.1.e, 3.7.B.2.c, and 3.7.B.2.e if Specification 3.9.A.1 and 3.9.A.2.a are satisfied.* The operator addresses Technical Specification 3.5.F.1 and determines that: *During any period when one emergency diesel generator (EDG) is inoperable, continued reactor operation is permissible only during the succeeding 72 hours unless such EDG is sooner made operable, provided that all of the low pressure core and containment cooling systems shall be operable, and the remaining EDG shall be operable*

		in accordance with 4.5.F.1. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be placed in the Cold Shutdown Condition within 24 hours. Determines that LPCI is inoperable due to the RHR Pump being inoperable. Determines that TS 3.5.f is not met due to LPCI being inoperable and that an orderly shutdown shall be initiated and the reactor shall be placed in the Cold Shutdown Condition within 24 hours.
	Cue	
	Notes	Per the TS bases, "The LPCI system consists of four LPCI pumps and associated piping and valves with all active components required to be operable." Although TS 3.9.B.3 addresses several LCOs the most limiting is TS 3.5.F.1.
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	Determine any NRC reportability requirements.
	Standard	The operator refers to PNPS 1.3.12 – Notification and Recall of Personnel. The operator determines that the event is reportable once the shutdown is initiated IAW PNPS 1.3.12 Attachment 2, Step 4, "The initiation of any plant shutdown required by the Technical Specifications", The operator determines that this is a 4 hour report as required by 50.72(b)(2)(i).
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

Evaluator Note: ***If the operator has successfully completed the first two critical steps associated with this JPM, perform the following:***

- ***Provide the operator with JPM Cue Sheet # 2 (page 10 of this JPM)***
- ***Solicit any questions the operator may have regarding the 2nd part of this JPM***

If the operator has not successfully completed the above two critical steps associated with this JPM, Cue that the JPM is complete.

3.	**Procedure Step:**	Refers to PNPS 1.3.6, Technical Specifications – Adherence and Clarifications IAW section 5.1, step [1](10), determines the following: In order to establish a consistent response to a Shutdown LCO, PNPS has established the following timeline for LCO resolution (CR-PNP-2011-3554 CA9). Upon entering a 24-hour cold shutdown action statement, with "T" being the time cold shutdown conditions are required to be established: a. T-16 .... b. T-14 .... c. T-12, commence a plant shutdown in accordance with PNPS 2.1.5.
	Standard	The operator determines that the reactor shutdown must start **no later** than 12 hours from now.
	Cue	
	Notes	The operator may also refer to Refers to PNPS 1.3.3, AUTHORITY TO SHUT DOWN AND START UP THE STATION and the example contained within Step 5.0[3]. In the example provided, the shutdown is commenced no later than 12 hours prior to the expiration of the 24 hour clock.
	Results	SAT ☐ UNSAT ☐

PERFORMANCE INFORMATION

4.	**Procedure Step:**	Determine what action satisfies the TS requirement of initiation of a plant shutdown.
	Standard	Refers to PNPS 1.3.3, AUTHORITY TO SHUT DOWN AND START UP THE STATION. Determines that IAW section 3, definition [3], initiation of a plant shutdown is defined as: *Commencement of the insertion of negative reactivity into the Reactor core for the purpose of Reactor shutdown. This negative reactivity insertion is usually accomplished by means of recirculation flow reduction and/or control rod insertion (other than by an automatic Scram signal).*
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

LIMITING CONDITIONS FOR OPERATION

3.5 CORE AND CONTAINMENT COOLING SYSTEMS

A. Core Spray and LPCI Systems (Cont)

4. During Run, Startup, and Hot Shutdown Modes with the LPCI system inoperable, restore the LPCI system to Operable status within 7 days and maintain both core spray systems and the diesel generators Operable. Otherwise, be in at least Cold Shutdown within 24 hours.

5. Two low pressure injection/spray subsystems shall be Operable during Cold Shutdown and Refuel Modes unless the reactor head is removed, the spent fuel pool gates are removed, and water level is at greater than or equal to elevation 114 foot, except as specified in 3.5.A.6.

6. During Cold Shutdown and Refuel Modes unless the reactor head is removed, the spent fuel pool gates are removed, and water level is at greater than or equal to elevation 114 foot:

   a. With one of the required low pressure injection/spray subsystems inoperable, restore the inoperable required low pressure injection/spray subsystem to Operable status within 4 hours. Otherwise, take immediate action to suspend activities with potential for draining the reactor vessel.

   b. With both of the required low pressure injection/spray subsystems inoperable, take immediate action to suspend activities with potential for draining the reactor vessel and restore 1 low pressure injection/spray subsystem to Operable status within 4 hours. Otherwise, take immediate action to restore secondary containment and one standby gas treatment system to Operable status and to restore isolation capability in each required secondary containment penetration flow path not isolated.

SURVEILLANCE REQUIREMENTS

4.5 CORE AND CONTAINMENT COOLING SYSTEMS

A. Core Spray and LPCI Systems (Cont)

1. c. Motor Operated Valve Operability — As Specified in 3.13

   d. Core Spray Header Δp Instrumentation

Check	Once/day
Calibrate	Once/3 months
Test Step	Once/3 months

2. This section intentionally left blank

3. LPCI system testing shall be as follows:

a. Simulated Automatic Actuation Test	Once/ Operating Cycle
b. Pump Operability.	When tested as specified in 3.13, verify that each LPCI pump delivers 4800 GPM at a head across the pump of at least 380 ft.
c. Motor Operated Valve Operability	As Specified in 3.13

LIMITING CONDITIONS FOR OPERATION

3.9 AUXILIARY ELECTRICAL SYSTEM (Cont)

B. Operation with Inoperable Equipment

Whenever the reactor is in Run Mode or Startup Mode with the reactor not in a Cold Condition, the availability of electric power shall be as specified in 3.9.B.1, 3.9.B.2, 3.9.B.3, 3.9.B.4, and 3.9.B.5.

1. From and after the date that incoming power is not available from the startup or shutdown transformer, continued reactor operation is permissible under this condition for:

   a. 3 days with the startup transformer inoperable

   or

   b. 7 days with the shutdown transformer inoperable

   During this period, both diesel generators and associated emergency buses must remain operable.

2. From and after the date that incoming power is not available from both startup and shutdown transformers, continued operation is permissible, provided both diesel generators and associated emergency buses remain operable, all core and containment cooling systems are operable, and reactor power level is reduced to 25% of design.

3. From and after the date that one of the diesel generators or associated emergency bus is made or found to be inoperable for any reason, continued reactor operation is permissible in accordance with Specifications 3.4.B.1, 3.5.F.1, 3.7.B.1.c, 3.7.B.1.e, 3.7.B.2.c, and 3.7.B.2.e if Specification 3.9.A.1 and 3.9.A.2.a are satisfied.

SURVEILLANCE REQUIREMENTS

4.9 AUXILIARY ELECTRICAL SYSTEM (Cont)

Auxiliary Electrical Equipment Surveillance (Cont)

3. Emergency 4160V Buses A5-A6 Degraded Voltage Annunciation System.

   a. Once each operating cycle, calibrate the alarm sensor.

   b. Once each 31 days perform a channel functional test on the alarm system.

   c. In the event the alarm system is determined inoperable under 3.b above, commence logging safety related bus voltage every 30 minutes until such time as the alarm is restored to operable status.

4. RPS Electrical Protection Assemblies

   a. Each pair of redundant RPS EPAs shall be determined to be operable at least once per 6 months by performance of an instrument functional test.

   b. Once per 18 months each pair of redundant RPS EPAs shall be determined to be operable by performance of an instrument calibration and by verifying tripping of the circuit breakers upon the simulated conditions for automatic actuation of the protective relays within the following limits:

Overvoltage	$\leq$ 132 volts
Undervoltage	$\geq$ 108 volts
Underfrequency	$\geq$ 57Hz

LIMITING CONDITION FOR OPERATION

3.5 CORE AND CONTAINMENT COOLING SYSTEMS (Cont)

F. Minimum Low Pressure Cooling and Diesel Generator Availability

1. During any period when one emergency diesel generator (EDG) is inoperable, continued reactor operation is permissible only during the succeeding 72 hours unless such EDG is sooner made operable, provided that all of the low pressure core and containment cooling systems shall be operable, and the remaining EDG shall be operable in accordance with 4.5.F.1. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be placed in the Cold Shutdown Condition within 24 hours.

   The 72 hours LCO can be extended to 14 days provided, in addition to the above requirements, the Station Black Out Diesel Generator is verified operable in accordance with 4.5.F.2.

2. Deleted

3. Deleted

4. Deleted

SURVEILLANCE REQUIREMENT

4.5 CORE AND CONTAINMENT COOLING SYSTEMS (Cont)

F. Minimum Low Pressure Cooling and Diesel Generator Availability

1. When it is determined that one EDG is inoperable, within 24 hours, determine that the operable EDG is not inoperable due to a common cause failure,

   OR

   perform surveillance 4.9.A.1.a for the operable EDG,

   AND

   within 1 hour and once every 8 hours thereafter, verify correct breaker alignment and indicated power availability for each offsite circuit.

2. Confirm the Station Black Out Diesel Generator (SBO-DG) has been demonstrated operable within the preceding 7 days

   OR

   within 72 hours of declaring an EDG inoperable, perform a surveillance to demonstrate that the SBO-DG is operable,

   AND

   within 1 hour of demonstrating the SBO-DG operability as specified above and once every 8 hours thereafter, verify normal breaker configuration.

Based on your findings determine the following:

1. How much time is available for troubleshooting the EDG before the commencement of a plant shutdown is required by station procedures. Justify your response.

2. IAW with station procedures, what constitutes the initiation of a plant shutdown when applying a Tech Spec action statement? Justify your response.

3. When complete, discuss your findings with your evaluator.

JPM CUE SHEET #1

INITIAL CONDITIONS:

- The plant is at rated power.
- RHR Pump "A" was declared inoperable 5 days ago. The pump is expected to be returned to service in 36 hours.
- The "B" EDG has just now also been declared inoperable.
- Troubleshooting activities have commenced but it is unknown when the EDG will be returned to service.
- All other equipment is operable.

INITIATING CUE:

1. Determine any Technical Specification actions and NRC notifications required by the EDG issue.
2. When complete, discuss your findings with your evaluator.

NRC JPM S/RO RC

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE
(RO)

TITLE: **Determine Offsite Release Rate**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	**15 / 25**	Actual Time (min):	

JPM RESULTS: SAT UNSAT
(Circle one)

COMMENT SHEET ATTACHED:

SYNOPSIS: Candidate uses provided radiation/release data to complete PNPS 2.1.15, Att. 2 Daily Log Test #34. The candidate will determine the ODCM limit has been exceeded. SRO candidates will additionally identify the ODCM impact.

TASK STANDARD: Complete PNPS 2.1.15, Att. 2 Daily Log Test #34 using provided radiation/release data. The candidate will determine the ODCM limit has been exceeded. SRO candidates must additionally identify the ODCM impact.

EVALUATION METHOD:

x Perform
Simulate

EVALUATION LOCATION:

Plant
x Simulator/Classroom
Control Room

Prepared: Tom Hooper **Date:** 08/24/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training
(or Designee)

TASK Title:	Task Number	K&A:	K&A RATING:
		2.3.11, Ability to control radiation releases	3.8 / 4.5

REFERENCES:

PNPS 2.1.15 Attachment 2
ODCM

SIMULATOR CONDITIONS:

None

GENERAL TOOLS AND EQUIPMENT:

Ensure blank copies of PNPS 2.1.15 Attachment 2 Daily Log Test #34 are available.

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

INITIAL CONDITIONS:

The plant is operating at power. Indications of a fuel element defect are present. A plant shutdown is in progress. Current radiation / release information is provided in the table below.

INITIATING CUE:

Complete PNPS 2.1.15 Attachment 2 Daily Log Test #34.

PERFORMANCE:

START TIME: _____

1.	**Procedure Step:**	1. Check and log the release of gross activity from the Main Stack as indicated by RM-1705-18A and RM-1705-18B on Panel C910 and from the Reactor Building Vent as indicated by RM-1705-32A and RM-1705-32B on Panel C910.
	Standard	Logs RM-1705-18A(B) and RM-1705-32A(B) readings in PNPS Att 2 Test #34 (see provided key).
	Comments	
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	2. Compare Channel A readings against Channel B for reasonable agreement. a. If difference is greater than 100% or either channel is downscale or upscale for RM-1705-18A and RM-7-05-18B, request assistance from chemistry to resolve discrepancy b. If difference is greater than 50% or either channel is downscale or upscale for RM-1705-32A and RM-17-05-32B, request assistance from chemistry to resolve discrepancy.
	Standard	Determines Channel A and B readings are in agreement (<50% and 100% difference).
	Comments	This step may be considered met by lack of a report to the contrary.
	Results	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	3. Mark the intersection of the measured points on the graph Figure 4 (Gross Activity Release Limit). If the mark is NOT within the triangle, notify the SM. The SM will take corrective action in accordance with ODCM Section 3.1.2.

	Standard	Marks the intersection of measured point on the graph on Figure 4 (see provided key). Determines the mark is NOT within the triangle. Determines need to notify SM.
	Comments	
	Results	SAT ☐ UNSAT ☐

4.	**Procedure Step:**	4. Compare instrument readings with recorder readings (apply criteria as in Step 2 above).
	Standard	Logs recorder readings PNPS Att 2 Test #34 (see provided key). Determines instrument and recorder readings are in agreement (<50% difference).
	Comments	The second half of the standard may be considered met by lack of a report to the contrary.
	Results	SAT ☐ UNSAT ☐

Evaluator: Terminate the task at this point for RO candidates once they have discussed their findings with you. Provide SRO Candidates with the additional SRO Only Handout once they have completed the above section.

Additional SRO Only Cue:
Inform the Candidate, "Determine the ODCM implications of your findings from PNPS Att 2 Test #34. Document your actions in the space below."

5.	**Procedure Step:**	Determine the ODCM implications of your findings from PNPS Att 2 Test #34.
	Standard	Determines ODCM 3.3.1 applies and requires "without delay restore the release rate to within the above limits" (or similar wording).
	Comments	
	Results	SAT ☐ UNSAT ☐

Terminating Cue: **Once SRO candidates discuss their actions, the JPM can be terminated.**

STOP TIME: _____

KEY

Daily Log Test #34

NOTE

RM-1705-18A/B and RM-1705-32A/B are classified as EITER. If any of these monitors become inoperable, Operators are to refer to EP-AD-270 for required compensatory measures.

Main Stack Monitoring & Reactor Building Vent Monitor Systems Check

ODCM
3.1.2
3.3.1.a
4.1.2

ODCM Table
4.1-2

SE3164
PR97 2538

1. Check and log the release of gross activity from the Main Stack as indicated by RM-1705-18A and RM-1705-18B on Panel C910 and from the Reactor Building Vent as indicated by RM-1705-32A and RM-1705-32B on Panel C910.

2. Compare Channel A readings against Channel B for reasonable agreement. If difference is greater than 50% or either channel is downscale or upscale, request assistance from Chemistry to resolve discrepancy.

	Main Stack RM-1705	
	18A	18B
cps	*6095*	*5988*
*µCi/sec	*36000*	*36000*

	Rx Building Vent RM-1705	
	32A	32B
cps	*608*	*589*
*µCi/sec	*4000*	*4000*

* EPIC calculates µCi/sec reading from "A" input only. If "A" rad monitor is not functional, use manual calculation method.

3. Mark the intersection of the measured points on the graph Figure 4 (Gross Activity Release Limit). If the mark is NOT within the triangle, notify the SM. The SM will take corrective action in accordance with ODCM Section 3.1.2.

KEY

Daily Log Test #34 (Continued)

4. Compare instrument readings with recorder readings (apply criteria as in Step 2 above).

NOTES

1. Malfunction of this instrumentation may affect the ODCM (Amendments 89 and 177). If a Work Request is issued, it must be verified that the ODCM is not impacted.
2. RR-1705-19 is classified as EITER. If RR-1705-19 becomes inoperable, Operators are to refer to EP-AD-270 for required compensatory measures.

Main Stack Recorder
RR-1705-19 Channel A (Red) 6 E 3 cps (Compare to RM-1705-18A)

Channel B (Blue) 6 E 3 cps (Compare to RM-1705-18B)

Rx Building Vent Recorder
RR-1705-24 Channel A (Red) 6 E 2 cps (Compare to RM-1705-32A)

Channel B (Blue) 6 E 2 cps (Compare to RM-1705-32B)

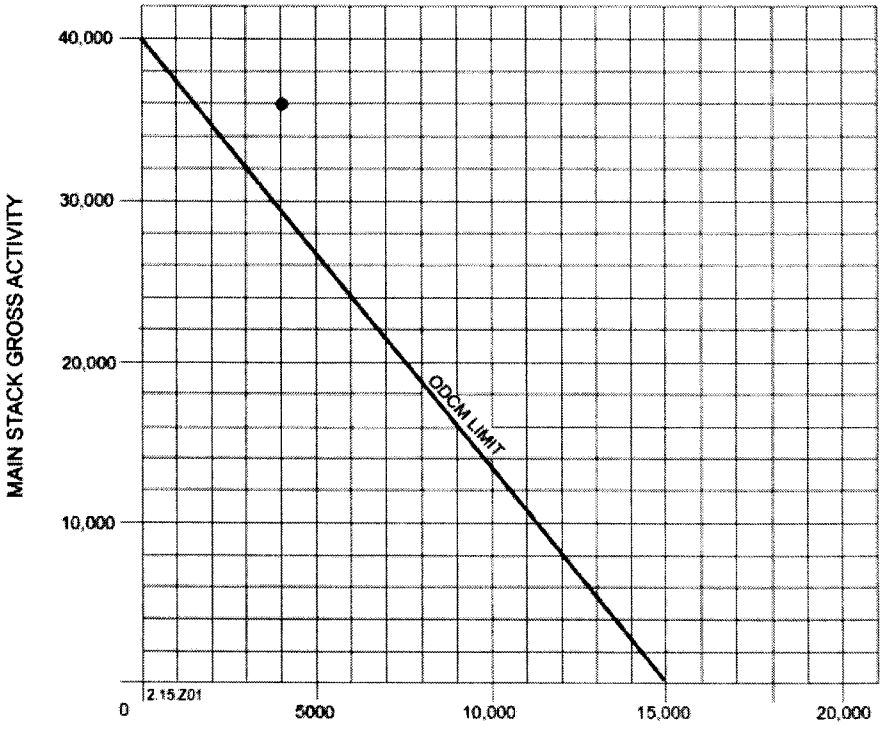
Performed by (Init.) _____ Reviewed by (Init.) _____

KEY

ATTACHMENT 2
Sheet 40 of 62

(Daily Log Test #34 Graph)

FIGURE 4: GROSS ACTIVITY RELEASE LIMIT



ODCM Sections 3.1.2 and 4.1.2

SRO ONLY CUE SHEET #2

Determine the ODCM implications of your findings from PNPS Att 2 Test #34. Document your Actions in the space below.

INITIAL CONDITIONS:

The plant is operating at power.

Indications of a fuel element defect are present.

A plant shutdown is in progress.

Current radiation / release information is provided in the table below.

INITIATING CUE:

Complete PNPS 2.1.15 Attachment 2 Daily Log Test #34.

Current Radiation / Release Information		
Main Stack RM-1705-18A	6095 cps	EPIC: 36,000 μCi/sec
Main Stack RM-1705-18B	5988 cps	
Reactor Building Vent RM-1705-32A	608 cps	EPIC: 4,000 μCi/sec
Reactor Building Vent RM-1705-32B	589 cps	
Main Stack Recorder RR-1705-19 Channel A (Red)	6 E 3 cps	
Main Stack Recorder RR-1705-19 Channel B (Blue)	6 E 3 cps	
Reactor Building Vent Recorder RR-1705-24 Channel A (Red)	6 E 2 cps	
Reactor Building Vent Recorder RR-1705-24 Channel B (Blue)	6 E 2 cps	

NRC JPM SRO EP

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE (SRO)

TITLE: **Determine Emergency Classification and Complete Required Notifications**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**30**	Actual Time (min):	
PERFORMANCE TIME:	Average Time (min):		Actual Time (min):	

JPM RESULTS: SAT UNSAT
(Circle one)

COMMENT SHEET ATTACHED:

SYNOPSIS: The SRO will assess plant conditions using the information provided, compare plant conditions against the Emergency Action Level (EAL) criteria, and declare the appropriate EAL. Following the initial declaration, the SRO will activate the PNPS Emergency Response Organization (ERO) and complete the notification of off-site agencies.

TASK STANDARD: The SRO will declare a Site Area Emergency based on EAL FS1.1, within 15 minutes. Following initial declaration the SRO will activate the PNPS ERO and complete the notification of off-site agencies in accordance with EP-IP-100. Notification of off-site agencies shall be completed within 15 minutes of initial declaration.

EVALUATION METHOD:

x Perform
Simulate

EVALUATION LOCATION:

Plant
x Simulator
Control Room

Prepared: Tom Hooper **Date:** 09/06/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training
(or Designee)

TASK Title:	Task Number	K&A:	K&A RATING:
Classify events requiring Emergency Plan implementation.	015-05-02-013	Generic 2.4.40	SRO 4.5

REFERENCES:

EP-IP-100 Emergency Classification and Notification

SIMULATOR CONDITIONS: None

1. The simulator may be initialized to any IC.
2. Using remote function MT22, set outside weather conditions to:
   a) Wind direction on 220 foot met tower: 264 degrees
   b) Wind speed on 220 foot met tower: 13 mph
3. Allow simulator to run a sufficient amount of time to allow the 15 minute averages on the met tower display to stabilize.
4. The Digital Notification System is Operable and in the Training Configuration.

GENERAL TOOLS AND EQUIPMENT:

None

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

INITIAL CONDITIONS:

1) PNPS was at full power when a seismic event occurred and was felt in the plant.
2) A Generator load reject and loss of off-site power occurred.
3) All control rods fully inserted.
4) Both Emergency Diesel Generators Started and 4160 VAC buses A5 and A6 have been re-energized. All other 4160 VAC buses have de-energized.
5) Following the scram, a coolant leak developed in the Drywell and all LPCI injection capability was lost.
6) Reactor water level lowered to -150 inches.
7) An Emergency RPV Depressurization was performed.
8) Reactor water level reached a low of -165 inches before being restored with Core Spray.
9) Reactor water level is now +20 inches and slowly rising.
10) Drywell pressure reached a peak of 19 psig before being lowered with sprays.
11) The magnitude of the seismic event has been determined to be above the Operating Basis Earthquake (OBE).
12) Weather conditions are as indicated on Panel MT1.

INITIATING CUE:

PNPS 2017 NRC JPM SRO EP

You are the Third SRO on shift. The Shift Manager is incapacitated. Implement the Emergency Plan as required.

PERFORMANCE:

Notes: This task is covered in EP-IP 100, Emergency Classification and Notification. Notification of Off-site Agencies will be completed via the Digital Notification Network.

Attachment 2 of this JPM contains the anticipated information to be entered for the initial notification to off-site agencies and may be used as an aid in evaluating the accuracy of the initial notification.

START TIME: _____

CRITICAL TIME FRAME #1 START TIME: _____

1.	**Procedure Step:**	NOTES Procedure steps and Attachments may be performed in parallel when appropriate to facilitate timely notifications. 5.2.1 Recognizing An Emergency [1] **WHEN** indications of abnormal conditions are received, **THEN** verify the symptoms/indications **AND THEN** compare them with the Emergency Action Levels (EP-IP-100.1 Attachment 1, Emergency Action Levels).
	Standard	Operator refers to EP-IP-100 to commence the evaluation and concurrent reviews EP-IP-100.1, Attachment 1, Emergency Action Levels.
	Cue	
	Notes	EP-IP-100 is a "Reference Use" procedure. The operator may go directly to the "EAL Chart" to determine the classification. This is acceptable.
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	(a) **IF** multiple EALs are exceeded, **THEN** identify the highest emergency classification level for which an EAL has been met or exceeded considering the following: (b) **IF** conditions warrant the issuance of Protective Action Recommendations (PARs), **THEN** the classification of General Emergency will be made. (c) **IF** plant conditions indicate a possible radiological release **OR** a release is in progress or suspected, **THEN** evaluate the applicability of offsite dose-based EALs (EAL AG1.2, AG1.3, AS1.2, and AS1.3).
	Standard	Operator determines that EAL FS1.1.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	5.2.2 Initial Declaration Of An Emergency From The Control Room [1] Announce to the Control Room operating staff: (a) That an emergency has been declared; (b) The emergency classification level; (c) Who has assumed the role of Emergency Director.
	Standard	Operator Announces that: A Site Area Emergency has been declared due to the loss of coolant accident at time (current time) and that he/she has assumed the role of the Emergency Director.
	Cue	
	Notes	Expected format of the announcement is in the form of a "Crew Update". Exact verbiage above is not required provided the information is provided.
	Results	SAT ☐ UNSAT ☐

CRITICAL TIME FRAME #1 END TIME: _____ (Must be ≤15 minutes from CRITICAL TIME FRAME #1 START)

CRITICAL TIME FRAME #2 START TIME: _____ (Same as Critical Time Frame #1 End Time)

4.	**Procedure Step:**	[2] Conduct initial emergency notifications as follows: (a) **IF** the event involves a security compromise or security considerations, **THEN** contact/consult with the Security Operations Supervisor or Shift Supervisor to determine whether ERO members should be directed to report to their respective Emergency Response Facilities or whether some alternate response is appropriate.
	Standard	Operator determines that event does not involve a security compromise or security considerations and continues to next step.
	Cue	
	Notes	Initial conditions indicated that a security event was not in progress.
	Results	SAT ☐ UNSAT ☐

5.	**Procedure Step:**	(b) **IF** the normal site egress/access point is unavailable for site evacuation, **THEN** direct the Security Operations Supervisor or Shift Supervisor to: (1) Dispatch Security personnel to unlock the appropriate gates (e.g., SAP, Gate 9, Shorefront). (2) Redirect personnel as appropriate. (3) **IF** necessary, **THEN** contact Maintenance to remove the vehicle barriers blocking the Shorefront gates.
	Standard	Operator determines that normal site egress/access is available and continues to next step.
	Cue	
	Notes	Initial conditions indicated that a security event site egress/access was not impacted by the event.
	Results	SAT [ ] UNSAT [ ]

6.	**Procedure Step:**	(c) **IF** the Gaitronics is inoperative during notifications to Station personnel at any time, **THEN** determine alternate means to disseminate information to plant personnel.
	Standard	Operator determines that GaiTronics is available and continues to the next step.
	Cue	
	Notes	No indication has been provided to indicate that GaiTronics is unavailable. Operator may do a brief test of the GaiTronics system.
	Results	SAT [ ] UNSAT [ ]

7.	**Procedure Step:**	(e) For events which are classified as a Site Area Emergency, complete the Site Area Emergency Notification Checklist (Attachment 9.3). Sound/have the Control Room sound the Emergency Site Evacuation Alarm and make the following announcement over the public-address system TWICE: A. **IF entering from no event, THEN:** "Attention all personnel, attention all personnel: a Site Area Emergency has been declared due to (*brief description of event*). Members of the Emergency Response Organization - (*Choose one:*) (1) Remain in place; await further instructions. (2) Report to your assigned Emergency Response Facility. (3) CR/TSC/OSC staff report to the alternate facility at the Chiltonville staging area. EOF/Joint Information Center staff report to your assigned Emergency Response Facility. **All other personnel** - *(Choose one:)* (1) Remain in place; await further instructions. (2) Evacuate to *(Assembly Area)"*. [ ]

	Standard	References Attachment 9.3. Indicates need to make emergency announcement.
	Cue	Another operator has completed the required emergency announcement.
	Notes	
	Results	SAT ☐ UNSAT ☐

8.	Procedure Step:	NOTIFICATION OF THE ERO - EMERGENCY FACILITY ACTIVATION NOTES 1. IF at any time Everbridge cannot be contacted or does not respond as expected, THEN go to Attachment 9.10, Backup Methods For Activation Of The Emergency Response Organization, for alternate Everbridge and backup methods for ERO activation. 2. IF all emergency response facilities have been activated and staffed, THEN subsequent Everbridge activation is not required unless directed by the Emergency Director. (Example: a change in the desired ERO response due to a security event.) 3. IF the event is a security incident, THEN the Shift Manager or Emergency Director and Security Shift Supervisor should consult to determine appropriate onsite public-address message to be used over Gaitronics (e.g., ERO should remain in place if onsite, ERO should find shelter if onsite, ERO should report to their assigned Emergency Response Facilities [including onsite TSC/OSC], or ERO should report to their alternate facilities [assigned JIC and EOF locations and TSC/OSC staging location]). 4. IF the Everbridge system is activated with erroneous information, THEN the erroneous original message is to be corrected and a new message initiated. A. IF initiating an initial Everbridge message, THEN
	Standard	Indicates need to activate the ERO using Everbridge.
	Cue	Another operator has completed activation of the ERO using Everbridge.
	Notes	
	Results	☐ SAT ☐ UNSAT

9.	**Procedure Step:**	**INITIAL NOTIFICATIONS (COMMONWEALTH AND LOCAL AUTHORITIES)** **NOTE** **All initial notifications to the Commonwealth and local authorities must be transmitted within 15 minutes of the event classification.** A. Within 15 minutes of the event classification, transmit an Initial Notification Form to the Commonwealth and local authorities. B. In the event the classification changes before the initial notification is transmitted, then implement one of the following actions: 1. **IF** a revision CAN be completed within the original 15-minute time limit from the previous classification, **THEN** revise the Initial Notification Form with the most current event classification and transmit the information to the Commonwealth and local authorities. **OR** 2. **IF** a revision CANNOT be completed within the original 15-minute time limit, **THEN** transmit the original, unrevised Initial Notification Form within the 15-minute time period with a caveat (if possible or as time permits) that a change in classification is forthcoming and in addition prepare and transmit the notification for the change in classification within its 15-minute time limit. C. If all normal communication methods (DNN, BECONS and commercial telephones) are unavailable, notify the MEMA Headquarters dispatcher at 508-820-2000 by satellite phone (or other means) and convey information on the Initial/Followup Notification Forms. Also, request that they relay this information to established 24-hour notification points of contact for PNPS EPZ and Reception Center towns/city using the procedures under the Emergency Classification Level. [ ] **INITIAL NOTIFICATIONS (COMMONWEALTH AND LOCAL AUTHORITIES) (CONTINUED)** **NOTE** **DNN operating instructions are contained in Attachment 9.11, Notification Equipment Operation, if needed.** D. Initiate DNN Initial Notification instructions as follows: 1. Record EAL number and time declared in space provided. [ ] **EAL Number: ____ ____ ____ . ____ (Obtain from ED) Time Declared: _____**
	Standard	Operator records "FS1.1" and the time of declaration in the space provided in the procedure.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

10.	**Procedure Step:**	2. Open the "DNN" program (icon available on "DNN" computer desktop) to fill out and transmit the Initial Notification Form. If the automated DNN system is not available, then go to Attachment 9.7, Backup Initial Notification Form Transmission Instructions, and implement backup notification instructions. [ ]
	Standard	DNN program is successfully opened on DNN laptop computer.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

11.	**Procedure Step:**	3. Verify Blocks 1 - 7 are complete and obtain ED approval. For guidance on individual block descriptions, refer to base document Section 5.2.8, Initial Notification Form Description. [ ]
	Standard	Blocks 1-7 are completed. Refer to attachment 2 for critical elements of the notification and the required degree of accuracy.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

12.	**Procedure Step:**	4. Press the "Show Notification Form" button. [ ] 5. Press the "Print w/ Approval Block" button AND obtain ED signature on printed form. [ ] 6. After ED approval is obtained, press the "Send Message" button. [ ]
	Standard	Presses the "Show Notification Form" button. Presses the "Print w/ Approval Block" button. Presses the "Send Message Button".
	Cue	
	Notes	Computer generated message will take approximately 10 seconds to appear if successful.
	Results	SAT ☐ UNSAT ☐

Cue: **This completes this JPM.**

CRITICAL TIME FRAME #2 END TIME: _____ (Must be ≤15 minutes from CRITICAL TIME FRAME #2 START)

STOP TIME: _____

Initial Notification Grading Aid
(Critical Elements are Shaded Grey)

PILGRIM NUCLEAR POWER STATION
INITIAL EMERGENCY NOTIFICATION

This is a Training Event

Notification Number: 1

As of __:__ on __/__/_____, Pilgrim Station has Entered a Site Area Emergency.

Degree of Accuracy: Time, ± 1 min of Declared Time
Date, Today's Date

EAL Number: FS1.1

Degree of Accuracy: Exact

Description of Event:
Loss or potential loss of any two barriers (Table F-1)

Note: Computer Fills this in Automatically

Emergency Radioactive Release IS NOT in progress.

Degree of Accuracy: Exact

Emergency Radioactive Release IS BELOW Protective Action Guides.

Note: Computer Fills this in Automatically

Meteorological Data as of __:__ on __/__/_____,:
Wind Direction FROM 264 degrees TO 84 degrees at 13 miles per hour.

–

PNPS's Protective Action Recommendations:
NO Protective Actions Necessary.

Note: Computer Fills this in Automatically

Notification initiated by _____ at (not yet sent).
(ENTERGY.COM_____ from NPI-D9HJHHF1)

This is a Training Event

Approved by _____

INITIAL CONDITIONS:

1) PNPS was at full power when a seismic event occurred and was felt in the plant.
2) A Generator load reject and loss of off-site power occurred.
3) All control rods fully inserted.
4) Both Emergency Diesel Generators Started and 4160 VAC buses A5 and A6 have been re-energized. All other 4160 VAC buses have de-energized.
5) Following the scram, a coolant leak developed in the Drywell and all LPCI injection capability was lost
6) Reactor water level lowered to -150 inches.
7) An Emergency RPV Depressurization was performed.
8) Reactor water level reached a low of -165 inches before being restored with Core Spray.
9) Reactor water level is now +20 inches and slowly rising.
10) Drywell pressure reached a peak of 19 psig before being lowered with sprays.
11) The magnitude of the seismic event has been determined to be above the Operating Basis Earthquake (OBE).
12) Weather conditions are as indicated on Panel MT1.

INITIATING CUE:

You are the Third SRO on shift. The Shift Manager is incapacitated. Implement the Emergency Plan as required.

NRC SIM JPM S1

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE (RO/SRO)

TITLE: **EMERGENCY DIESEL GENERATOR MONTHLY SURVEILLANCE ATERNATE PATH**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	15	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for UNSAT, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The Reactor is at approximately 7% power during a startup. The monthly operability run of the "A" EDG is in progress. The "A" EDG has already been started and the Operator will commence the EDG run. As KW loading is increased, the EDG governor will run high. The operator is expected to recognize high KW loading and open the EDG output breaker and trip the EDG.

TASK STANDARD: The EDG surveillance will be performed IAW procedure 8.9.1. The diesel will be successfully paralleled to the bus and load increased. When the governor runs high, the operator will unload the engine by opening its output breaker and tripping the EDG.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
X Simulator
Control Room

Prepared: Tom Hooper **Date:** 08/16/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number	Date	Description
0	10/15/07	New JPM to support the 2007 Annual Operating Exam
1	11/21/13	Updated JPM for 2014 NRC exam. Removed several non-critical steps to both shorten the JPM and which did not add any value to the evaluation of the operator.
2	02/08/14	Revised JPM following NRC Prep week.
3	08/16/16	Updated for 2017 NRC exam.

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
RESPOND TO A DIESEL GENERATOR SPEED CONTROL GOVERNOR MALFUNCTION.	264-04-01-004	264000	A3.04 3.1/3.1

REFERENCES:

PNPS 8.9.1, EMERGENCY DIESEL GENERATOR SURVEILLANCE

SIMULATOR CONDITIONS:

1. Initialize the simulator to IC-186.
2. Verify the following has been completed:
   a) Place the DIESEL GEN A TEST switch to "TEST" on Panel C3.
   b) Place the DIESEL GEN A GOVERNOR MODE SELECTOR switch to "DROOP" on Panel C3.
   c) Start the EDG
   d) Acknowledge the EDG trouble alarm
   e) Create a trigger that will override the governor control switch to RAISE when KW load is > 1300 KW.
   f) Create a trigger that will override the governor control switch to OFF when KW load is > 3050 KW.
3. An IOS operator is standing by to support the operator in responding to the JPM.

GENERAL TOOLS AND EQUIPMENT:

1. Key for the "A" EDG Test Switch
2. Copy of 8.9.1, completed Section 7.0 Prerequisites and Attachment 1 up through section 1.3, Diesel Start Local. Section 1.3 is to be signed off in its entirety.

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. **Provide Candidate with Initial Conditions/Cue sheet of this JPM (Last page of this JPM).**
3. "The task conditions are as follows:
   a) The SUT is supplying all the electrical buses
   b) The monthly operability run of the "A" EDG is in progress IAW procedure 8.9.1
   c) The diesel has been started and is running unloaded.
   d) The procedure has been completed through Attachment 1, Section 1.3 – Diesel Start - Local.
   e) The diesel is ready to be paralleled to the bus.
   f) An operator is standing by in the diesel room.
   g) No other testing or surveillances are currently being performed."
4. Allow the operator time to review the prepared copy of 8.9.1 prior to commencing and solicit and answer any questions the operator may have.

INITIATING CUE:
State the following:

"[State the operator's name], continue the operability run of the "A" EDG commencing with Attachment 1, Section 1.4, Diesel Start – Local, commencing at step [1].

This Task is not Time Critical

PERFORMANCE:

Notes This task is covered in procedure 8.9.1.
All controls are located on panel C3.
All critical steps must be performed in order written unless otherwise noted

START TIME: _____

1.	**Procedure Step:**	[1] RECORD start initiation time on Attachment 1C. (a) RECORD diesel VOLTAGE and FREQUENCY as indicated on Panel C3.
	Standard	Records start time on Attachment 1C Records Voltage and frequency in the spaces provided on step [1].
	Cue	If asked, cue that the EDG was started 5 minutes ago.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

2.	**Procedure Step:**	(b) Using the DIESEL GEN A VOLTAGE REGULATOR SETPOINT ADJUSTER, ADJUST the diesel generator output voltage to 4200 volts.
	Standard	Operator adjusts the output voltage to 4200 volts
	Cue	None
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

3.	**Procedure Step:**	[2] VERIFY diesel generator voltage and speed vary on demand. (a) Using the DIESEL GEN A VOLTAGE REGULATOR SETPOINT ADJUSTER, RAISE the voltage regulator setpoint until the upper limit white light illuminates.

	Standard	Voltage is raised until the upper limit white light illuminates (light above the switch)
	Cue	None
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

4.	**Procedure Step:**	(b) LOWER the voltage regulator setpoint until diesel generator output voltage is approximately 4100 volts.
	Standard	Voltage is lowered to 4100 volts
	Cue	None
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

5.	**Procedure Step:**	(a) SET the DIESEL GEN A TO BUS A5 synchronizing switch to "ON".
	Standard	Switch placed to on. Synchronizing meter will turn on.
	Cue	None
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

6.	**Procedure Step:**	(a) SET incoming voltage slightly above the running voltage.
	Standard	Using incoming and running meters associated with the Synchronizing meter, incoming voltage is adjusted to be above running voltage
	Cue	None
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

	Comments:	

7.	**Procedure Step:**	(b) Using the DIESEL GEN A GOVERNOR SPEEDCONTROL, RAISE frequency approximately 1 Hz.
	Standard	Frequency is raised ~ 1 Hz as indicated on the frequency meter.
	Cue	None
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

8.	**Procedure Step:**	(c) LOWER frequency by approximately 2 Hz.
	Standard	Frequency is lowered ~ 2 Hz as indicated on the frequency meter.
	Cue	None
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

9.	**Procedure Step:**	NOTE If EDG "A" is to be paralleled with the Startup Transformer, then the degraded voltage protection for both A5 and A6 is to be declared inoperable in accordance with Technical Specifications Table 3.2.B.
	Standard	Operator reads the note and proceeds to the next step.
	Cue	If told of need to declare degraded voltage protection inoperable, acknowledge report and inform candidate that this has been done.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

10.	Procedure Step:	[4] PARALLEL Diesel Generator "A" to Bus A5. (a) ADJUST DIESEL GEN A GOVERNOR SPEED CONTROL to produce a slow rotation in the FAST direction.
	Standard:	Synchronizing meter is rotating slowly in the fast direction.
	Cue:	None
	Notes:	
	Performance:	SATISFACTORY _____ UNSATISFACTORY _____
	Comments:	

11.	**Procedure Step:**	(b) VERIFY/SET incoming voltage slightly above the running voltage.
	Standard	Observes incoming vs. running voltage and makes adjustment if necessary.
	Cue	None
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

12.	Procedure Step:	(a) SLIGHTLY BEFORE an "in phase" indication, CLOSE Breaker A509, DIESEL GEN A TO BUS A5.
	Standard:	Breaker A509 is closed and remains closed.
	Cue:	None
	Notes:	
	Performance:	SATISFACTORY _____ UNSATISFACTORY _____
	Comments:	

13.	Procedure Step:	(b) IMMEDIATELY INCREASE load to 500KW (460 to 560KW) with the DIESEL GEN A GOVERNOR SPEED CONTROL.
	Standard:	KW meter indicates ~ 500 KW
	Cue:	None

Notes	
Performance:	SATISFACTORY _____ UNSATISFACTORY _____
Comments:	

14.	**Procedure Step:**	[5] SET the DIESEL GEN A TO BUS A5 synchronizing switch to "OFF".
	Standard	Synchronizing meter de-energizes when switch is placed to OFF.
	Cue	None
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

15.	Procedure Step:	[6] INCREASE reactive load to 250kVAR (200 to 300kVAR) with the DIESEL GEN A VOLTAGE REGULATOR SETPOINT ADJUSTER. a) RECORD time:
	Standard:	KVAR meter indicates ~ 250 KVAR. Operator records time in the space provided (non-critical)
	Cue:	None
	Notes:	Recording the time is not a critical element of this critical step.
	Performance:	SATISFACTORY _____ UNSATISFACTORY _____
	Comments:	

16.	Procedure Step:	[7] AFTER the diesel has run for at least 8 minutes: a) INCREASE load to 1000kW (950 to 1050kW) using the DIESEL GEN A GOVERNOR SPEED CONTROL.
	Standard:	KW meter indicates ~ 1000 KW
	Cue:	Cue the operator that eight minutes has elapsed.
	Notes:	
	Performance:	SATISFACTORY _____ UNSATISFACTORY _____

	Comments:	

17.	Procedure Step:	(b) INCREASE reactive load to 500kVAR (450 to 550kVAR) using the DIESEL GEN A VOLTAGE REGULATOR SETPOINT ADJUSTER. (c) RECORD time.
	Standard:	KVAR meter indicates ~ 500 KVAR. Operator records time in the space provided (non-critical)
	Cue:	None
	Notes:	Recording the time is not a critical element of this critical step. The governor malfunction will occur in the next step when KW loading exceeds 1300KW.
	Performance:	SATISFACTORY _____ UNSATISFACTORY _____
	Comments:	

18.	Procedure Step:	(b) AFTER the diesel has run for at least 8 minutes: (a) INCREASE load to 1800kW (1750 to 1850kW) using the DIESEL GEN A GOVERNOR SPEED CONTROL.
	Standard:	Load is raised > 1300 KW. Operator observes and reports KW oscillations **(ALTERNATIVE PATH).**
	Cue:	Role Play as required as CRS and acknowledge the report.
	Notes:	The operator may just respond to this indication. This step is to be evaluated based on the operator's actions and not solely on any single report. Precaution 3 of this procedure states: "The surveillance shall be aborted by opening EDG Circuit Breaker A609 or A609 and tripping the EDG if any of the following parameters exist: (a) xVAR increase above 1500kVAR (b) **kW increase above 3000kW** (c) Unexpected continuous decrease or increase in reactive load. (d) **Unexpected continuous decrease or increase in kW** (e) Unexpected continuous decrease or increase in field amps"
	Performance:	SATISFACTORY _____ UNSATISFACTORY _____

	Comments:	

19.	Procedure Step:	Operator opens the Diesel output breaker
	Standard	Breaker A509 is opened by rotating control switch counterclockwise
	Cue	None
	Notes	
	Performance:	SATISFACTORY _____ UNSATISFACTORY _____
	Comments:	

20.	**Procedure Step:**	Operator directs tripping EDG A
	Standard	Operator properly communicates need to trip EDG A
	Cue	As field operator, acknowledge request to trip EDG A
	Notes	This is considered a non-critical step for the purposes of this JPM because JPM step 19 alone protects the EDG and does so quicker than tripping the EDG from the field.
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

Cue: **This completes this JPM.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: PNPS 2017 NRC Sim JPM S1

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The SUT is supplying all the electrical buses
- The monthly operability run of the "A" EDG is in progress IAW procedure 8.9.1
- The diesel has been started and is running unloaded.
- The procedure has been completed through Attachment 1, Section 1.3 – Diesel Start - Local.
- The diesel is ready to be paralleled to the bus.
- An operator is standing by in the diesel room.
- No other testing or surveillances are currently being performed.

INITIATING CUE:

Continue the operability run of the "A" EDG commencing with Attachment 1, Section 1.4, Diesel Start – Local, commencing at step [1]].

This Task is not Time Critical

NRC SIM JPM S2

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE
(RO/SRO)

TITLE: **ISOLATE A CONDENSER WATERBOX DURING CHLORIDE INTRUSION**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	
PERFORMANCE TIME:	Average Time (min):	15	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The plant is at approximately 50% with indications of high conductivity in the 1-3 waterbox. The operator must isolate water box 1-3.

TASK STANDARD: The operator will isolate Water Box 1-3 due to chloride intrusion IAW PNPS 2.4.33 Att.3. The procedure shall be followed with no failure of critical elements.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
X Simulator
Control Room

Prepared: Tom Hooper **Date:** 8/16/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
RESPOND TO A CONDENSER CHLORIDE INTRUSION.	256-01-01-025	256000	A2.15 2.8/3.1

REFERENCES:

PNPS 2.4.33 ATTACHMENT 3.

SIMULATOR CONDITIONS:

1. Reset to IC-77 (~50%), this will establish:
   - Annunciators for "Conductivity Hi" is in alarm (C1L-D5, D6 and D7)
   - Outlet conductivity is >0.3

GENERAL TOOLS AND EQUIPMENT:

1. N/A

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. Always state the following two paragraphs:
   a) "The title of this JPM is: **ISOLATE A CONDENSER WATERBOX DURING CHLORIDE INTRUSION"**
   b) "The task conditions are as follows:
      i) The plant is operating at approximately 50% power
      ii) PNPS 2.4.33 has been entered due to chloride intrusion
      iii) The location of the leak has been determined to be Waterbox 1-3
      iv) You are only responsible for annunciators and actions occurring on Panel C1
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

Isolate Waterbox 1-3 IAW PNPS 2.4.33 Att.3.

PERFORMANCE:

Notes Reviews precautions & limitations of PNPS 2.4.33

START TIME: _____

1.	Procedure Step:	[1] To isolate the 1-3 Condenser, **PERFORM** the following: (a) **CLOSE** the following vapor valves to the steam jet air ejectors: • AO-3710, Chdr A West Side Off Gas Valve SV-3710 • AO-3704, Chdr B East Side Off Gas Valve SV-3704
	Standard:	Closes the following vapor valves to the steam jet air ejectors (Panel C10): • SV-3710, CNDSR A WEST SIDE OFFGAS VALVE • SV-3704, CNDSR B EAST SIDE OFFGAS VALVE
	Cue:	
	Notes:	
	Results:	SAT ☐ UNSAT ☐

	Note	Step parts [1][b] and [1][c] below must be performed together.
2.	Procedure Step:	(b) PARTIALLY CLOSE the following Water Box Inlet Valves (valve is 12 to 18% open when white light illuminates): • MO-3670 (Water Box #3 Inlet Valve) • MO-3672 (Water Box #1 Inlet Valve) (c) WHEN the first white light (12 to 18% open position) comes on in Step [1][b], THEN STOP Screenwell Pump B, P-106B.
	Standard:	Partially closes the following Water Box Inlet Valves (valve is 12 to 18% open when white light illuminates) (Panel C1): • MO-3670 (Water Box #3 Inlet Valve) • MO-3672 (Water Box #1 Inlet Valve) • Stops Screenwell Pump B, P-106B.
	Cue:	
	Notes:	Valves require about 90 seconds to reach 18% OPEN.
	Results:	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	(d) FULLY CLOSE the following Water Box Inlet Valve: • MO-3872(Water Box #1 Inlet Valve).
	Standard	Fully closes MO-3872 (Water Box #1 Inlet Valve).
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

4.	**Procedure Step:**	(e) IF 3-water box operation is desired, THEN PERFORM Steps [1](f) through [1](j) in sequence. IF 3-water box operation is NOT desired, THEN OMIT Steps [1](f) through [1](j).
	Standard	Continues on in procedure (omits step [1](f) through [1](j)
	Cue	When asked, state that 3-waterbox operation is NOT desired
	Notes	
	Results	SAT ☐ UNSAT ☐

5.	**Procedure Step:**	(f) IF 3-water box operation is NOT desired, **THEN PERFORM** Steps [1](f) through [1](j). (f) **OPEN** the following Scavenger System valve: • AO-3842 (1-3 Condenser Vent Valve)
	Standard	Contacts operator and directs opening AO-3842 (1-3 Condenser Vent Valve).
	Cue	When contacted as an operator, acknowledge the request to open AO-3842 (1-3 Condenser Vent Valve), then reply that AO-3842 has been opened.
	Notes	
	Results	SAT ☐ UNSAT ☐

6.	**Procedure Step:**	(m) AFTER the Condenser quadrant has drained (approximately 5 minutes), CLOSE MO-3870, WATER BOX #3 INLET VLV (Seawater Inlet from 1-3 Condenser).
	Standard	Closes MO-3870, WATERBOX #3 INLET VLV (Seawater Inlet from 1-3 Condenser).
	Cue	Report to the candidate that 5 minutes has elapsed.
	Notes	
	Results	SAT ☐ UNSAT ☐

7.	**Procedure Step:**	(n) CLOSE the following valve: • AO-3842 (1-3 Condenser Vent Valve)
	Standard	Contacts operator and directs closing AO-3842 (1-3 Condenser Vent Valve).
	Cue	When contacted as operator, acknowledge the request to close AO-3842 (1-3 Condenser Vent Valve), then reply that AO-3842 has been closed.
	Notes	
	Results	SAT ☐ UNSAT ☐

This JPM is complete.

STOP TIME: _____

INITIAL CONDITIONS:

- The plant was operating at approximately 50% power
- PNPS 2.4.33 has been entered due to chloride intrusion
- The location of the leak has been determined to be Waterbox 1-3
- You are only responsible for annunciators and actions occurring on Panel C1

INITIATING CUE:

Isolate Waterbox 1-3 IAW PNPS 2.4.33 Att.3.

NRC SIM JPM S3

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE (RO/SRO)

TITLE: **Reactor Recirculation Pump Start, Alternate Path**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	15	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for UNSAT, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The Reactor is shutdown with RRP A shutdown and RRP B operating. The candidate will start RRP A. During the evolution, cooling water flow to the pump will be isolated (Alternate Path). The candidate will secure the pump in response to or in anticipation of high temperatures.

TASK STANDARD: RRP A is started per PNPS 2.2.84 section 7.2 starting at step [3]. The candidate diagnoses low cooling water flow and secures RRP A.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
X Simulator
Control Room

Prepared: Tom Hooper **Date:** 08/16/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number	Date	Description
0	8/16/16	New JPM to support the 2017 NRC exam

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
Startup a recirculation pump		202001	A4.01 (3.7/3.7)

REFERENCES:

PNPS 2.2.84, Reactor Recirculation System
ARP C904RC –G6

SIMULATOR CONDITIONS:

1. Initialize the simulator to IC-78.
2. Verify the following:
   a) All control rods are in.
   b) The Reactor is depressurized (may be at very low pressure <~50 psig).
   c) RRP A is secured and ready to start with the suction valve closed.
   d) RRP B is running.
   e) PNPS 2.2.84 section 7.1.2 is ready to perform.
   f) A trigger is set to isolated RBCCW to RRP A (MO-4037B closed) when the green light for NO-202-5A (RRP A discharge) goes off.
3. An IOS operator is standing by to support the operator in responding to the JPM.

GENERAL TOOLS AND EQUIPMENT:

1. N/A

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. **Provide Candidate with Initial Conditions/Cue sheet of this JPM (Last page of this JPM).**
3. "The task conditions are as follows:
   a) The Reactor is shutdown at approximately 50 psig.
   b) RRP A is ready to be started.
   c) PNPS 2.2.84 in-plant prestart checks (section 7.1.1) have been completed SAT, with the exception that the RRP A suction valve and seal water block valve still need to be opened from the Control Room.
   d) PNPS 2.2.84 attachment 5 (RRP start checklist) is in progress and being controlled by another operator. Conditions support start of RRP A.
   e) RRP A has NOT undergone seal maintenance while shutdown."
4. Allow the operator time to review the prepared copy of PNPS 2.2.84 prior to commencing and solicit and answer any questions the operator may have.

INITIATING CUE:
State the following:

"[State the operator's name], complete RRP A prestart checks per PNPS 2.2.84 section 7.1.2. Then, start RRP A per PNPS 2.2.84 section 7.2."

This Task is not Time Critical

PERFORMANCE:

Notes This task is covered in procedure 2.2.84.
All controls are located on panel C904.
All critical steps must be performed in order written unless otherwise noted

START TIME: _____

1.	**Procedure Step:**	Section 7.1.2 [1] On Panel C7, THROTTLE OPEN MO-4037B, RBCCW from Reactor Recirc Pump A Cooler Outlet Throttle Valve, by use of manual potentiometer. This pot may have to be adjusted periodically to maintain desired maximum temperature to less than 105°F.
	Standard	Observes / checks MO-4037B potentiometer open.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

2.	**Procedure Step:**	[2] IF the Reactor is shutdown, VERIFY Reactor water level is at or above +35"
	Standard	Observes Reactor water level is > +35".
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

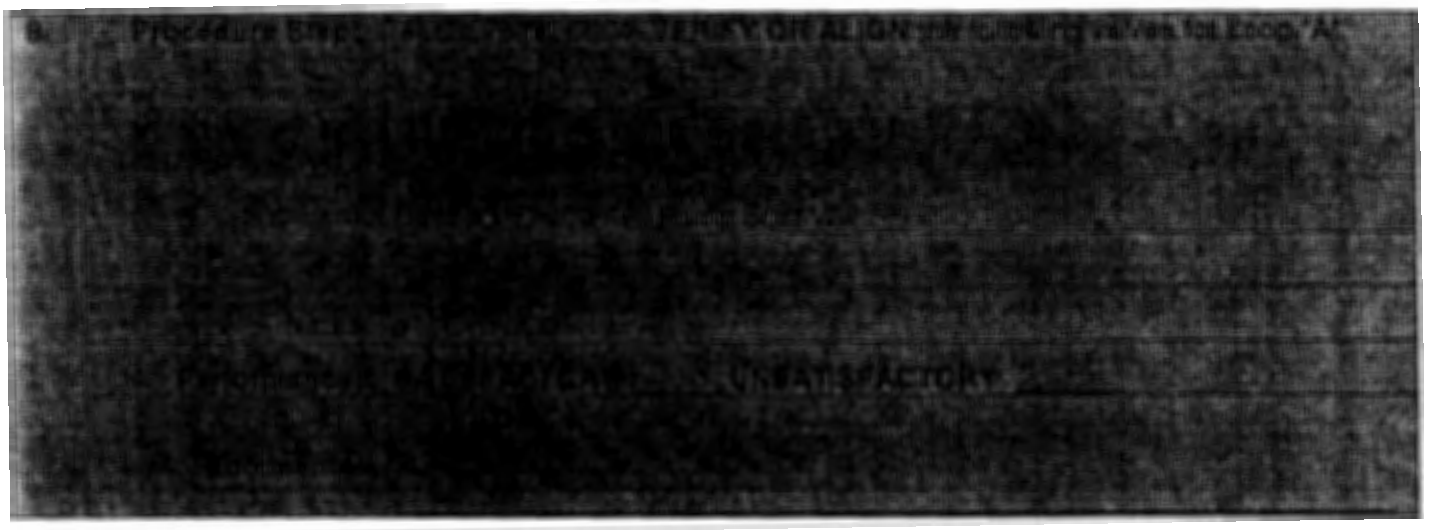
4.	**Procedure Step:**	(b) Recirc Pump "A" Speed Controller SIC-262-25A is in the MANUAL mode. ("M" is illuminated on controller next to the bar graphs.)
	Standard	Observes "M" light is illuminated on SIC-262-25A.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

5.	**Procedure Step:**	(c) Operator setpoint, as indicated on the alphanumeric readout and left bar graph of SIC-262-25A, is set at 26%.
	Standard	Utilizes SEL button on SIC-262-25A as necessary to read left bar graph setting. Observes Operator setpoint is approximately 26%
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

6.	**Procedure Step:**	(d) Vibration and oil pressure alarms reset.
	Standard	Observes absence of alarms (C904RC-B6, C904RC-D5).
	Cue	
	Notes	

	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

7.	**Procedure Step:**	(e) VERIFY that DPI-260-3A Diff Press is reading < 5.0 psid.
	Standard	Observes DPI-260-3A Diff Press is reading < 5.0 psid
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	



[redacted]

10.	**Procedure Step:**	(c) MO-202-5A, Pump Disch Vlv: CLOSED.
	Standard	Observes MO-202-5A, Pump Disch Vlv is closed.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

11.	**Procedure Step:**	Section 7.2 [1] PERFORM OR VERIFY PERFORMED Section 7.1.
	Standard	Determines section 7.1 is complete.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

12.	**Procedure Step:**	[2] START Section A (or B, if appropriate) of Attachment 5 [Reactor Recirculation Pump Start Checklist (OPER-19)] AND ENSURE that Technical Specifications temperature limits are satisfied.
	Standard	Determines from initial conditions that Attachment 5 is in progress and conditions are SAT.
	Cue	If asked if Attachment 5 still supports start of RRP A, report that Attachment 5 is SAT for start of RRP A.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

	Comments:	

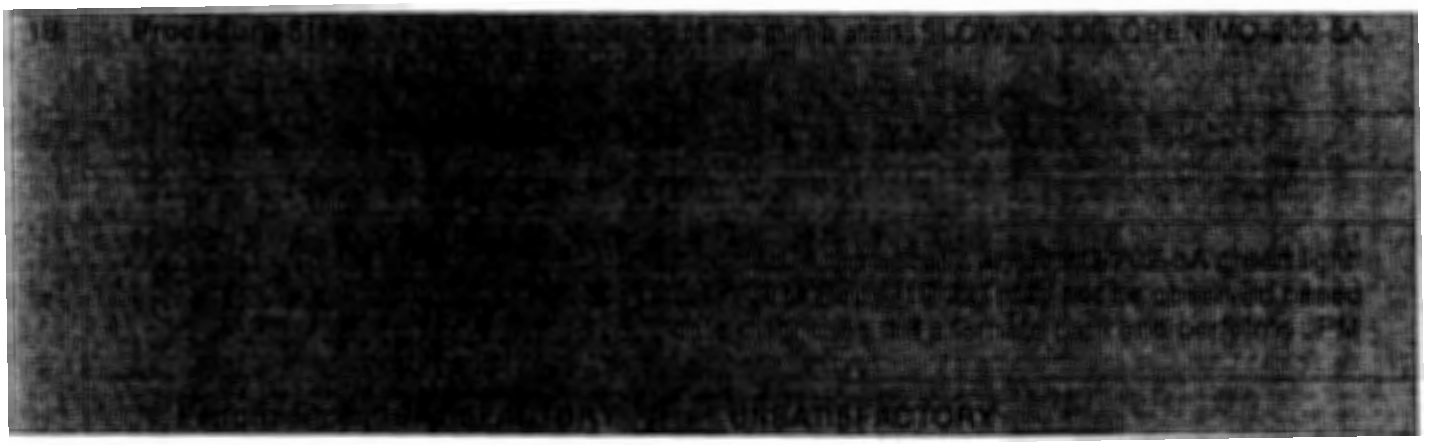
13.	**Procedure Step:**	[3] VERIFY Operator setpoint, as indicated on the alphanumeric readout and left bar graph of SIC-262-25A, is set at 26%.
	Standard	Utilizes SEL button on SIC-262-25A as necessary to read left bar graph setting. Observes Operator setpoint is approximately 26%
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

14.	**Procedure Step:**	**CAUTION before step [4]** When Recirc controller(s) is in Manual mode and center bar graph (speed indication) is selected, pressing either arrow key (up/down) will vary recirc speed.
	Standard	Reads Caution and continues in procedure.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

15.	**Procedure Step:**	[4] IF the Recirculation Pump is to be started for the first time following Recirculation Pump seal maintenance, THEN PERFORM the following steps (OTHERWISE, GO TO Step [5]):
	Standard	Determines from initial conditions that RRP A has not undergone seal maintenance while shutdown and proceeds to step [5].
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

	Comments:	

17.	**Procedure Step:**	(a) SELECT center bar graph for controller actual speed indication.
	Standard	Utilizes SEL button on SIC-262-25A as necessary to read center bar graph setting.
	Cue	
	Notes	This may have been done by the operator prior to actually starting the pump.
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	



19.	**Procedure Step:**	[7] ENSURE RBCCW cooling water outlet valve from MG set oil cooler, TCV-4070A, automatically maintains outlet oil temperature at 120°F (110°F to 130°F).
	Standard	Verifies no EPIC alarms for MG set oil cooler
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

20.	**Procedure Step:**	[8] OBSERVE Recirc Pump A Flow Indicator FI-260-5A increases to about 12,000 GPM.
	Standard	Observes proper flow on FI-260-5A.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

21.	**Procedure Step:**	[9] OBSERVE Jet Pump Flow No. 5, FI-263-102A, AND Jet Pump Flow No. 10, FI-263-102B, indicate approximately the same flow.
	Standard	Observes proper flow on FI-263-102A and FI-263-102B
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

22.	**Procedure Step:**	[10] VERIFY the following instrumentation readings on Panel C904: (a) Recirc Controller SIC-262-25A (B) actual speed (center bar graph) and speed demand (right bar graph) indicate approximately 26%. (b) Recirc Pump A (B) Diff Press, DPI-260-3A (B), reads approximately 5 psi. (c) Pump A (B) Current, 202-60-730A (B), reads approximately 100 amps. (d) MG Set A (B) Gen Voltage, 202-60-736A (B), reads approximately 800 volts. (e) MG Set A (B) Motor Current, 202-60-733A (B), reads approximately 120 amps
	Standard	Observes proper indications.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

23.	**Procedure Step:**	Recognizes / reports annunciator C904RC-G6, PUMP A SEAL COOLING FLOW LO.
	Standard	Recognizes / reports annunciator C904RC-G6, PUMP A SEAL COOLING FLOW LO.
	Cue	If informed of alarm, acknowledge report. If asked how to proceed, ask for a recommendation and then tell them to carry out their recommendation.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

24.	**Procedure Step:**	Executes ARP C904RC-G6.
	Standard	Performs any or all of the following: • Check Recirc Pump A seal cavity temperatures on temperature recorder TR-262-19 on Back Panel C921 • Verify the seal purge flow rate on FI-R004A (Rx Bldg above the "B" RHR Valve Room) - IF seal purge flow is lost, THEN trip the "A" Recirc Pump within 10 minutes and enter PNPS 2.4.17 • Check RBCCW System pressure on PI-4008 on Panel C1 • Check RBCCW flow from Drywell components on flow recorder FR-9014 (RB El. 23' West) • Check Drywell sump integrators for signs of excessive leakage • Check position of RBCCW valve MO-4037B, Pump A Outlet Vlv, on Panel C7 • Monitor Recirc Pump A seal cavity temperatures and pump performance to prevent damage
	Cue	If dispatched to check seal purge flow rate on FI-R004A, report that flow rate is 0 gpm.
	Notes	The report of 0 gpm seal purge flow rate meets a requirement in the ARP to trip RRP A within 10 minutes.
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

Cue: **This completes this JPM.**

STOP TIME: _____

INITIAL CONDITIONS:

a) The Reactor is shutdown at approximately 50 psig.
b) RRP A is ready to be started.
c) PNPS 2.2.84 in-plant prestart checks (section 7.1.1) have been completed SAT, with the exception that the RRP A suction valve and seal water block valve still need to be opened from the Control Room.
d) PNPS 2.2.84 attachment 5 (RRP start checklist) is in progress and being controlled by another operator. Conditions support start of RRP A.
e) RRP A has NOT undergone seal maintenance while shutdown."

INITIATING CUE:

Complete RRP A prestart checks per PNPS 2.2.84 section 7.1.2.

Then, start RRP A per PNPS 2.2.84 section 7.2.

This Task is not Time Critical.

NRC SIM JPM S4

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE
(RO/SRO)

TITLE: **Swap RHR Pumps in Shutdown Cooling**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	20	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for UNSAT, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The Reactor is shutdown with RHR pump A operating in the Shutdown Cooling lineup. The operator will start RHR pump C per PNPS 2.2.19.1 attachment 3. The operator will then secure RHR pump A per PNPS 2.2.19.1 attachment 5.

TASK STANDARD: RHR pump C is started per PNPS 2.2.19.1 attachment 3. Then, RHR pump A is secured per PNPS 2.2.19.1 attachment 5.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
X Simulator
Control Room

Prepared: Tom Hooper **Date:** 11/29/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number	Date	Description
0	11/29/16	Modified existing JPM to support the 2017 NRC exam

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
		205000	A4.01 (3.7/3.7)

REFERENCES:

PNPS 2.2.19.1, Residual Heat Removal System – Shutdown Cooling Mode of Operation

SIMULATOR CONDITIONS:

1. Initialize the simulator to IC-79.
2. Verify the following:
   a) All control rods are in.
   b) The Reactor is depressurized (may be at very low pressure ≤~50 psig).
   c) RHR pump A is operating in the SDC lineup.
   d) Both RRPs are secured.
   e) Both RRP discharge valves are closed and caution tagged (MO-202-5A/B).
   f) MO-1001-16A is throttled, but close to full open.
   g) PNPS 2.2.19.1 is ready to perform.
3. An IOS operator is standing by to support the operator in responding to the JPM.

GENERAL TOOLS AND EQUIPMENT:

1. N/A

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. **Provide Candidate with Initial Conditions/Cue sheet of this JPM (Last page of this JPM).**
3. "The task conditions are as follows:
   a) The Reactor is shutdown.
   b) RHR pump A is operating in the Shutdown Cooling mode per PNPS 2.2.19.1 Attachment 2 Section 3.5.
   c) Another operator is controlling Reactor water level between +20" to +25"."
4. Allow the operator time to review the prepared copy of PNPS 2.2.19.1 prior to commencing and solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[State the operator's name], start RHR pump C for Shutdown Cooling per PNPS 2.2.19.1 attachment 3. Then, secure RHR pump A per PNPS 2.2.19.1 attachment 5 section 3.0[1]."

This Task is not Time Critical

PERFORMANCE:

Notes This task is covered in procedure 2.2.19.1

All controls are located on panel C904.

All critical steps must be performed in order written unless otherwise noted.

START TIME: _____

1.	**Procedure Step:**	Attachment 3 [1] VERIFY RHR Loop "A" Shutdown Cooling has been placed in service in accordance with Attachment 2 Section 3.5 of this Procedure.
	Standard	Determines RHR pump A is operating in the Shutdown Cooling mode per PNPS 2.2.19.1 Attachment 2 Section 3.5 per the initial conditions.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

2.	**Procedure Step:**	[2] IF in service, SECURE Recirc Pump P-201B in accordance with PNPS 2.2.84. (IF not required, ENTER "N/P".)
	Standard	Observes Recirc Pump P-201B is secured and enters "N/P".
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

3.	**Procedure Step:**	[3] VERIFY CLOSED/CLOSE MO-202-5A, Pump Disch Vlv.
	Standard	Observes MO-202-5A is closed by green light on, red light off.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

4.	**Procedure Step:**	[4] VERIFY CLOSED/CLOSE MO-202-5B, Pump Disch Vlv.
	Standard	Observes MO-202-5A is closed by green light on, red light off.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

5.	**Procedure Step:**	[5] PLACE/VERIFY PLACED Caution Tag on MO-202-5A stating that the Recirc Pump discharge valve should remain CLOSED during SDC operation if the associated Recirc Pump is secured.
	Standard	Observes MO-202-5A is caution tagged.
	Cue	If asked about wording of caution tag, direct operator to simulate that the caution tag contains the procedurally required wording.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

VERIFICATION OF COMPLETION

6.	**Procedure Step:**	[6] PLACE/VERIFY PLACED Caution Tag on MO-202-5B stating that the Recirc Pump discharge valve should remain CLOSED during SDC operation if the associated Recirc Pump is secured.
	Standard	Observes MO-202-5B is caution tagged.
	Cue	If asked about wording of caution tag, direct operator to simulate that the caution tag contains the procedurally required wording.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

8.	**Procedure Step:**	[8] NOTIFY Radiation Protection (RP) that RHR Pump A or C is about to be started in the SDC mode. RP should monitor the "A" RHR Quadrant and the "A" Valve Room for radiological changes.
	Standard	Notifies examiner or IOS operator of pump start and requirement to monitor for radiological changes.
	Cue	Acknowledge notification.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

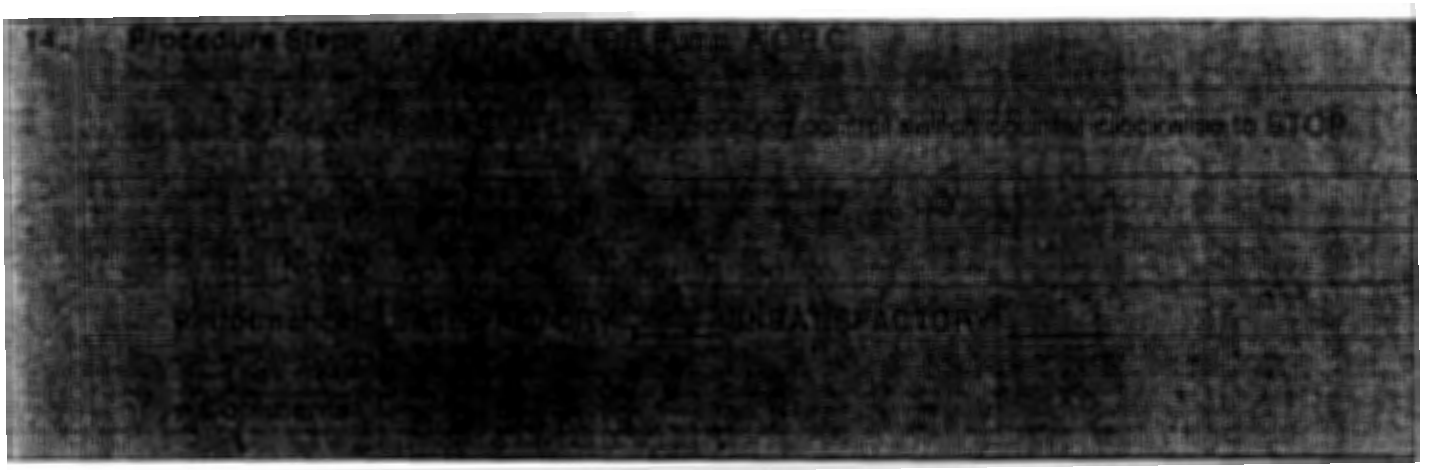
10.	**Procedure Step:**	[10] ADJUST flow to maintain 4800 to 9600 GPM by throttling MO-1001-28A, LPCI Loop A Injection Throttle Valve #1.
	Standard	Observes RHR loop A flow. Adjusts MO-1001-28A if necessary to establish 4800 to 9600 GPM.
	Cue	Inform the operator that the remaining steps of Attachment 3 have been completed and they are to continue by securing RHR pump A using attachment 5.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

11.	**Procedure Step:**	Attachment 5 Section 3.0 [1] IF two RHR Pumps are in service, THEN PERFORM the following (IF not performed, ENTER "N/P"): (a) To return to single RHR Pump operation: (1) IF required, VERIFY/ADJUST the Reactor water level between +20" to +25". (IF not required, ENTER "N/P".)
	Standard	Observes Reactor water level is between +20" and +25".
	Cue	Tell the operator that Reactor water level is +23".
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

12.	**Procedure Step:**	(2) THROTTLE CLOSED MO-1001-28A, LPCI Inj Throttle Vlv #1, slowly adjusting RHR flow rate to 4000 to 4800 GPM as indicated on FI-1040-1A and/or FI-1040-2A (RHR Total Flow Indicators).
	Standard	Throttles closed MO-1001-28A to obtain RHR flow rate of 4000 to 4800 GPM.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

VERIFICATION OF COMPLETION

13.	**Procedure Step:**	(3) VERIFY the Reactor water level is stable.
	Standard	Observes Reactor water level is stable.
	Cue	Tell the operator that Reactor water level is stable.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	



15.	**Procedure Step:**	(5) ADJUST flow to 4000 to 4800 GPM using MO-1001-28A.
	Standard	Observes RHR loop A flow. Adjusts MO-1001-28A if necessary to establish 4000 to 4800 GPM.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

Cue: **This completes this JPM.**

STOP TIME: _____

INITIAL CONDITIONS:

- The Reactor is shutdown.
- RHR pump A is operating in the Shutdown Cooling mode per PNPS 2.2.19.1 Attachment 2 Section 3.5.
- Another operator is controlling Reactor water level between +20" to +25".

INITIATING CUE:

Start RHR pump C for Shutdown Cooling per PNPS 2.2.19.1 attachment 3.

Then, secure RHR pump A per PNPS 2.2.19.1 attachment 5 section 3.0[1].

This Task is not Time Critical.

SHUTDOWN COOLING WITH TWO RHR PUMPS IN RHR LOOP "A"

NOTES

1. The time and date when RHR is placed in or is removed from the SDC mode is to be recorded in the CRS logbook.
2. Whenever a Recirc loop is isolated with PNPS 2.1.7 in progress, the preferred method of monitoring Reactor coolant temperature is by using RHR inlet flow (EPIC point RHR014 for Loop "A" and EPIC point RHR016 for Loop "B").

CAUTION

Whenever two pump operation is required, MO-1001-16A must be fully open to prevent RHR Heat Exchanger E-207A damage.

		Initials
[1]	**VERIFY** RHR Loop "A" Shutdown Cooling has been placed in service in accordance with Attachment 2 Section 3.5 of this Procedure.	_____
[2]	**IF** in service, **SECURE** Recirc Pump P-201B in accordance with PNPS 2.2.84. (**IF** not required, **ENTER** "N/P".)	_____
[3]	**VERIFY CLOSED/CLOSE** MO-202-5A, Pump Disch Vlv.	_____
[4]	**VERIFY CLOSED/CLOSE** MO-202-5B, Pump Disch Vlv.	_____
[5]	**PLACE/VERIFY PLACED** Caution Tag on MO-202-5A stating that the Recirc Pump discharge valve should remain CLOSED during SDC operation if the associated Recirc pump is secured.	_____
[6]	**PLACE/VERIFY PLACED** Caution Tag on MO-202-5B stating that the Recirc Pump discharge valve should remain CLOSED during SDC operation if the associated Recirc pump is secured.	_____
[7]	**FULLY OPEN/VERIFY FULL OPEN** MO-1001-16A, RHR HX A Byp Vlv.	_____

Initials

[8] **NOTIFY** Radiation Protection (RP) that RHR Pump A or C is about to be started in the SDC mode. RP should monitor the "A" RHR Quadrant and the "A" Valve Room for radiological changes. _____

[9] **START** the idle RHR Pump A **OR** C. _____

[10] **ADJUST** flow to maintain 4800 to 9600 GPM by throttling MO-1001-28A, LPCI Loop A Injection Throttle Valve #1. _____

[11] **PLACE/VERIFY PLACED** Caution Tag to the MO-1001-16A control switch to indicate that the valve shall be FULL OPEN with two RHR Pumps in service. _____

[12] **ESTABLISH** the following RBCCW System operating conditions:

(a) **OBSERVE** the Reactor Vessel cooldown rate. It should not exceed 100°F per hour. _____

(b) **MONITOR** the RBCCW temperature at the RHR heat exchanger outlet (RHR010 for E-207A). _____

(c) **MAINTAIN** the RBCCW outlet temperature < 200°F. _____

(d) **MAINTAIN** the RBCCW flow through the RHR heat exchanger > 250 GPM (RBC006 for E-207A). _____

[13] **IF** available, **MONITOR** the following RHR parameters on EPIC:

(a) RHR002, A RHR Loop Flow _____

(b) RHR014, A RHR HX Inlet Temp _____

(c) RHR018, A RHR HX Outlet Temp _____

[14] Performed by:

_____
Name (print) Initials

_____
Name (print) Initials

_____
Name (print) Initials

NRC SIM JPM S5

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE (RO/SRO)

TITLE: **Start HPCI for Injection (ATERNATE PATH)**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	15	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for UNSAT, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The Reactor is scrammed at approximately 920 psig. Reactor water level is low and Feedwater and RCIC are tripped. The operator is directed to start HPCI per PNPS 5.3.35.1. The manual pushbutton method fails, so the operator starts HPCI by individual component manipulation. During start, the HPCI flow controller fails low while in Auto. The operator takes manual control of HPCI to inject to the Reactor.

TASK STANDARD: HPCI is started per PNPS 5.3.35.1. The HPCI flow controller is operated in Manual to establish injection from HPCI to the Reactor.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
X Simulator
Control Room

Prepared: Tom Hooper **Date:** 08/17/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number	Date	Description
0	08/17/16	Modified bank JPM to create new alternate path JPM for 2017 NRC exam.

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
		206000	A4.04 3.7/3.7

REFERENCES:

PNPS 5.3.35.1, Transient Response Hardcards for Operating Crews

SIMULATOR CONDITIONS:

1. Initialize the simulator to IC-190.
2. Verify the following has been completed:
   a) The Reactor is scrammed.
   b) Reactor pressure is approximately 920 psig.
   c) Reactor water level is low but above the HPCI initiation setpoint.
   d) All Feedwater pumps are tripped.
   e) RCIC is tripped.
   f) The HPCI manual start pushbutton is overridden OFF.
   g) Malfunction HP04 is active to fail the HPCI flow controller low in Auto.
3. An IOS operator is standing by to support the operator in responding to the JPM.

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. **Provide Candidate with Initial Conditions/Cue sheet of this JPM (Last page of this JPM).**
3. "The task conditions are as follows:
   a) The Reactor has scrammed.
   b) Reactor pressure is approximately 920 psig.
   c) RCIC and all Feedwater pumps have tripped.
   d) Injection with HPCI is desired to raise Reactor water level."
4. Allow the operator time to review the initial conditions and solicit and answer any questions the operator may have.

INITIATING CUE:
State the following:

"[State the operator's name], start HPCI and inject to the Reactor per PNPS 5.3.35.1 Attachment 18."

This Task is not Time Critical

PERFORMANCE:

Notes This task is covered in procedure 5.3.35.1.

All controls are located on panel C903.

All critical steps must be performed in order written unless otherwise noted

START TIME: _____

1.	**Procedure Step:**	Attachment 18 [1] MOMENTARILY DEPRESS the HPCI System Injection Mode push button.
	Standard	
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

2.	**Procedure Step:**	Recognize / report failure of HPCI System Injection Mode push button to start HPCI.
	Standard	Observes HPCI does not start. Reports failure of HPCI to start.
	Cue	When informed of failure, acknowledge report. If asked how to proceed, ask for recommendation and then tell operator to carry out recommendation.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

3.	**Procedure Step:**	Proceed to PNPS 5.3.35.1 Attachment 19, HPCI Injection – Manual Alignment.
	Standard	Proceeds to PNPS 5.3.35.1 Attachment 19, HPCI Injection – Manual Alignment.
	Cue	
	Notes	PNPS 2.2.21.5 Attachment 1 is also acceptable.
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

4.	**Procedure Step:**	Attachment 19 IF the HPCI System Injection Mode push button does not start HPCI, PERFORM the following steps to manually place HPCI into Injection Mode. [1] VERIFY Flow Controller FIC-2340-1, INJECTION FLOW CONTROL, is in AUTO and set for 4250 gpm.
	Standard	Observes Flow Controller FIC-2340-1, INJECTION FLOW CONTROL, is in AUTO and set for 4250 gpm.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

5.	**Procedure Step:**	[2] START P-223, GLAND SEAL CONDENSER BLOWER
	Standard	Starts P-223, GLAND SEAL CONDENSER BLOWER
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

6.	**Procedure Step:**	[3] OPEN MO-2301-14, PUMP MIN FLOW VLV.
	Standard	Opens MO-2301-14, PUMP MIN FLOW VLV.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

7.	**Procedure Step:**	[4] PERFORM the following steps in close sequence: (a) OPEN MO-2301-3, TURBINE SUPPLY VLV. (b) As MO-2301-3 begins its stroke, START P-229, AUX OIL PUMP. (c) As MO-2301-3 begins its stroke, OPEN MO-2301-8, INJ VLV #2.
	Standard	Performs the following steps in close sequence: (a) Opens MO-2301-3, TURBINE SUPPLY VLV. (b) As MO-2301-3 begins its stroke, starts P-229, AUX OIL PUMP. (c) As MO-2301-3 begins its stroke, opens MO-2301-8, INJ VLV #2.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	

8.	**Procedure Step:**	Recognize / report lack of HPCI flow to the Reactor.
	Standard	Observe low HPCI flow. Report low HPCI flow.
	Cue	When informed of failure, acknowledge report. If asked how to proceed, ask for recommendation and then tell operator to carry out recommendation.
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

9.	**Procedure Step:**	Place HPCI INJECTION FLOW CONTROL in MANUAL.
	Standard	Places HPCI INJECTION FLOW CONTROL in MANUAL.
	Cue	
	Notes	
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

10.	**Procedure Step:**	Adjust HPCI INJECTION FLOW CONTROL potentiometer to establish injection from HPCI to the Reactor.
	Standard	Raises HPCI flow by adjusting HPCI INJECTION FLOW CONTROL potentiometer.
	Cue	
	Notes	Once the operator has demonstrated the ability to establish HPCI injection to the Reactor, the JPM may be terminated.
	Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
	Comments:	_____

Cue: **This completes this JPM.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: PNPS 2017 NRC Sim JPM S5

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The Reactor has scrammed.
- Reactor pressure is approximately 920 psig.
- RCIC and all Feedwater pumps have tripped.
- Injection with HPCI is desired to raise Reactor water level.

INITIATING CUE:

Start HPCI and inject to the Reactor per PNPS 5.3.35.1 Attachment 18.

NRC SIM JPM S6

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE
(RO/SRO)

TITLE: **INERTING THE CONTAINMENT**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	15	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The reactor is at about 125 psig during a startup. The operator will line up to inert containment IAW PNPS 2.2.70 Att.8 beginning at step 4.1[12]. A cooler will begin leaking causing an annunciator alarm (C7L-A5,6) requiring the operator to isolate the flowpath per Att.13 Step 3.0[2].

TASK STANDARD: Inert containment IAW PNPS 2.2.70 Att.8. Isolate the system IAW PNPS 2.2.70 ATT.13 upon alarm indications of a cooler leak. Evolution shall be performed in accordance with all system precautions and limitations and without failure of any critical elements.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
X Simulator
Control Room

Prepared: Tom Hooper **Date:** 8/16/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
INERTING THE CONTAINMENT		223001 A4.10	3.2/3.2

REFERENCES:

1. PNPS 2.2.70 Att.8 & 13

SIMULATOR CONDITIONS:

1. IC-76 (Reactor pressure is ~125 psig during a startup)
2. PNPS 2.2.70 Att.8 complete thru Step 4.1[12]
3. At JPM Step 17 – trigger inserts alarms:
   - C7L-A5 and A6 "Cooler NNN leaking"

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical elements are shaded in grey throughout the body of this document

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. The task conditions are as follows:
   i) The Reactor is at about 125 psig during a startup.
   ii) Containment inerting preparations have started IAW PNPS 2.2.70 Att.8. The procedure is complete through Step 4.1[12].
3. Solicit and answer any questions the operator may have.

INITIAL CONDITIONS:

- The Reactor is at approximately 125 psig during a startup.
- Containment inerting preparations have started IAW PNPS 2.2.70 Att.8. The procedure is complete through Step 4.1[12]

INITIATING CUE:

Line up SGTS A train to inert containment IAW PNPS 2.2.70 Att.8 beginning at step 4.1[12].

PERFORMANCE:

Notes

START TIME: _____

1.	**Procedure Step:**	IF while purging, venting, OR inerting the containment, alarm is received which requires termination of the purging, venting, or inerting evolution, THEN EXIT this Attachment AND ENTER base document Section 7.10 (Isolation of Containment Purge Lines Upon Indication of Reactor Coolant Pressure Boundary Leakage). Alarms are listed below:
		• "SBGT DISCH RAD HI" (C904LC-F4)
		• "C19 A/B TROUBLE" (C904LC-B3)
		• "DRYWELL EQPT DRAIN SUMP DISCH HIGH TOTAL FLOW" (C20C)
		• "DRYWELL FLOOR DRAIN SUMP DISCH HIGH TOTAL FLOW (C20C)
		• "DRYWELL EQPT DRAIN PUMP SUMP HIGH LEVEL" (twice within 30 minutes) (C20L)
		• "DRYWELL FLOOR DRAIN SUMP HIGH LEVEL" (twice within a 160-minute interval) (C20L)
		• "COOLER 'NNN' LEAKING alarms, where 'NNN' is the specific cooler number (more than one unit in alarm) Panel C7L windows A5, A6, A7, B5, B6, B7, C5, and C6
	Standard	Operator reviews alarms listed above.
	Cue	
	Notes	This step will be executed later when the alternate path is revealed.
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	In the Control Room, LINE UP the Containment Atmospheric Control System as follows: VERIFY the control switches for the following valves are in the "AUTO" position at Panel C904:
		• AO-5035A, DRYWELL PURGE SUPPLY ISOL VLV
		• AO-5036A, TORUS PURGE SUPPLY ISOL VLV
	Standard	Verifies the control switches for the following valves are in the "AUTO" position at Panel C904:
		• AO-5035A, DRYWELL PURGE SUPPLY ISOL VLV
		• AO-5036A, TORUS PURGE SUPPLY ISOL VLV
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	OPEN the following valves from Panel C7:
		• AO-5042A, TORUS PURGE EXHAUSE ISOL VLV
		• AO-5042B, TORUS PURGE EXHAUST ISOL VLV
	Standard	Opens the following valves from Panel C7:
		• AO-5042A, TORUS PURGE EXHAUSE ISOL VLV
		• AO-5042B, TORUS PURGE EXHAUST ISOL VLV
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

4.	**Procedure Step:**	VERIFY CLOSED AO-5035A, DRYWELL PURGE SUPPLY ISOL VLV, from Panel C7.
	Standard	Verifies Closed AO-5035A, DRYWELL PURGE SUPPLY ISOL VLV, from Panel C7.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

5.	**Procedure Step:**	CLOSE the air supply block valve to AO-5035A, DRYWELL PURGE SUPPLY ISOL VLV, located in the Drywell personnel air lock access.
	Standard	Contacts Field Operator to close the air supply block valve to AO-5035A, DRYWELL PURGE SUPPLY ISOL VLV, located in the Drywell personnel air lock access.
	Cue:	Acknowledge request and then report the air supply block valve to AO-5035A is closed.
	Notes	
	Results	SAT ☐ UNSAT ☐

6.	**Procedure Step:**	VERIFY CLOSED AO-5035B, DRYWELL PURGE SUPPLY ISOL VLV.
	Standard	Verifies Closed AO-5035B, DRYWELL PURGE SUPPLY ISOL VLV.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

7.	**Procedure Step:**	VERIFY CLOSED AO-5036B, TORUS PURGE SUPPLY ISOL VLV.
	Standard	Verifies Closed AO-5036B, TORUS PURGE SUPPLY ISOL VLV.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

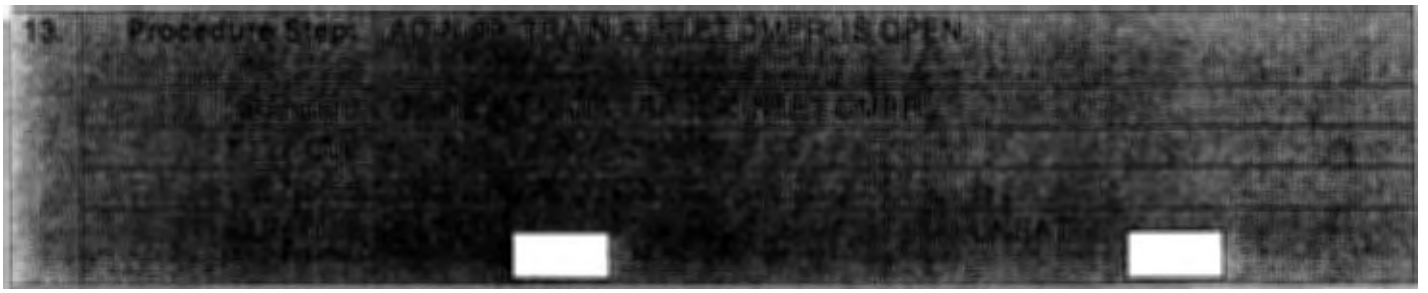
8.	**Procedure Step:**	OPEN AO-5033B, DW/TORUS N_2 PURGE ISOL VLV.
	Standard	Opens AO-5033B, DW/TORUS N_2 PURGE ISOL VLV.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

9.	**Procedure Step:**	THROTTLE OPEN 9-HO-262, N_2 Supply to Drywell/Torus Purge Block Valve. (Rx Bldg El. 23')
	Standard	Contacts Field Operator to throttle Open 9-HO-262, N_2 Supply to Drywell/Torus Purge Block Valve.
	Cue	Acknowledge request and then report that 9-HO-262 is throttled open.
	Notes	
	Results	SAT ☐ UNSAT ☐

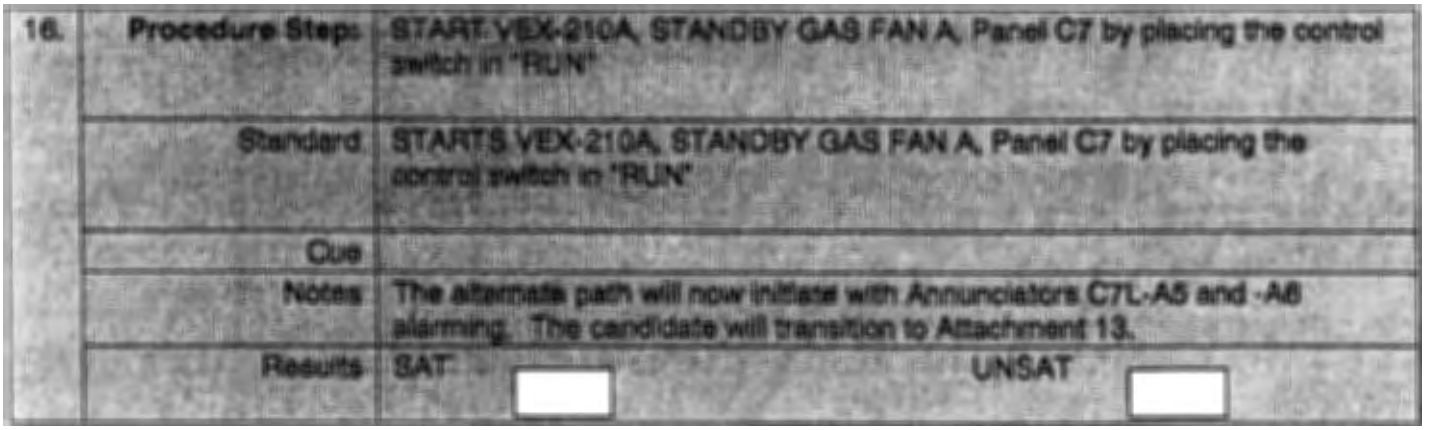
10.	**Procedure Step:**	OPEN 9-HO-117, Primary Cntmt Atm Control N_2 Purge Supply Block Valve. (Drywell Access, Rx Bldg El. 23')
	Standard	Contacts Field Operator to open 9-HO-117, Primary Cntmt Atm Control N_2 Purge Supply Block Valve.
	Cue	Acknowledge request and then report that 9-HO-117 is open.
	Notes	
	Results	SAT ☐ UNSAT ☐

11.	**Procedure Step:**	IF using the "A" Standby Gas Treatment (SGTS) train, VERIFY OR ESTABLISH the lineup at Panel C7 as follows: VERIFY OPEN OR OPEN AO-N-98, Contaminated Exh to SGTS Inlet Plenum, as needed to maintain flow/pressure.
	Standard	Opens AO-N-98, Contaminated Exh to SGTS Inlet Plenum.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

12.	**Procedure Step:**	VERIFY OPEN OR OPEN AO-N-101, Refuel Floor Exh to SGTS Inlet Plenum, as needed to maintain flow/pressure.
	Standard	Opens AO-N-101, Refuel Floor Exh to SGTS Inlet Plenum.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐



15.	**Procedure Step:**	VEX-210B, STANDBY GAS FAN B, is in "STANDBY".
	Standard	Observes VEX-210B, STANDBY GAS FAN B, is in "STANDBY".
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐



17.	**Procedure Step:**	Record the start time in the CRS LOG
	Standard	Recognizes / reports Annunciators C7L-A5 and -A6 and transitions to Attachment 13.
	Cue	Acknowledge any reports.
	Notes	
	Results	SAT ☐ UNSAT ☐

18.	**Procedure Step:**	IAW Attachment 13 Section 3.0 Step [2]: IF, while venting, purging, or inerting the containment during power operation, any of the following alarms are received: • "SBGT DISCH RAD HI" (C904LC-F4) • "C19 A/B TROUBLE" (C904LC-B3) • "DRYWELL EQPT DRAIN SUMP DISCH HIGH TOTAL FLOW" (C20C) • "DRYWELL FLOOR DRAIN SUMP DISCH HIGH TOTAL FLOW" (C20C) • "DRYWELL EQPT DRAIN PUMP SUMP HIGH LEVEL" (twice within 30 minutes) (C20L) • "DRYWELL FLOOR DRAIN SUMP HIGH LEVEL" (twice within a 2-hour 40-minute interval) (C20L) • **"COOLER 'NNN' LEAKING"** alarms, where 'NNN' is the specific cooler number (more than one unit in alarm) **Panel C7L windows A5, A6,** A7, B5, B6, B7, C5, and C6 THEN CLOSE OR VERIFY CLOSED the following valves: (a) SV-5030A, N2 Makeup Supply Block Valve
	Standard	Observes SV-5030A, N_2 Makeup Supply Block Valve, is closed.
	Cue	
	Notes	Annunciators above in **BOLD** will alarm
	Results	SAT ☐ UNSAT ☐

19.	**Procedure Step:**	CLOSES OR VERIFIES CLOSED AO-5035A, Drywell Purge Supply Isol Vlv.
	Standard	Closes AO-5035A, Drywell Purge Supply Isol Vlv.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

20.	**Procedure Step:**	CLOSES OR VERIFIES CLOSED AO-5036A, Torus Purge Supply Isol Vlv.
	Standard	Observes AO-5036A, Torus Purge Supply Isol Vlv, is closed.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

21.	**Procedure Step:**	CLOSES OR VERIFIES CLOSED AO-5041A, Torus Normal Exhaust Isol Vlv.
	Standard	Observes AO-5041A, Torus Normal Exhaust Isol Vlv, is closed.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

22.	**Procedure Step:**	CLOSES OR VERIFIES CLOSED AO-5041B, Torus Normal Exhaust Isol Vlv.
	Standard	Observes AO-5041B, Torus Normal Exhaust Isol Vlv, is closed.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

23.	**Procedure Step:**	CLOSES OR VERIFIES CLOSED AO-5042A, Torus Purge Exhaust Isol Vlv.
	Standard	Closes AO-5042A, Torus Purge Exhaust Isol Vlv.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

24.	**Procedure Step:**	CLOSES OR VERIFIES CLOSED AO-5042B, torus Purge Exhaust Isol Vlv.
	Standard	Closes AO-5042B, Torus Purge Exhaust Isol Vlv.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

25.	**Procedure Step:**	CLOSES OR VERIFIES CLOSED AO-5043A, Drywell Normal Exhaust Isol Vlv.
	Standard	Observes AO-5043A, Drywell Normal Exhaust Isol Vlv, is closed.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

26.	**Procedure Step:**	CLOSES OR VERIFIES CLOSED AO-5043B, Drywell Normal Exhaust Isol Vlv.
	Standard	Observes AO-5043B, Drywell Normal Exhaust Isol Vlv, is closed.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

27.	**Procedure Step:**	CLOSES OR VERIFIES CLOSED AO-5044A, Drywell Purge Exhaust Isol Vlv.
	Standard	Observes AO-5044A, Drywell Purge Exhaust Isol Vlv, is closed.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

28.	**Procedure Step:**	CLOSES OR VERIFIES CLOSED AO-5044B, Drywell Purge Exhaust Isol Vlv.
	Standard	Observes AO-5044B, Drywell Purge Exhaust Isol Vlv, is closed.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

29.	Procedure Step:	RETURN SGTS to "AUTO" mode as follows: IF "A" SGTS was running, THEN at Panel C7, PLACE control switch for VEX-210A, Standby Gas Fan A, to "AUTO".
	Standard	Places control switch for VEX-210A, Standby Gas Fan A, to "AUTO".
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

30.	**Procedure Step:**	IF "B" SGTS was running, THEN at Panel C7, PLACE control switch for AO-N-106, Train B Inlet Dmpr, to "AUTO".
	Standard	N/A – B was not running
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

31.	Procedure Step:	VERIFY OR PLACE the following dampers into the "AUTO" position: • AO-N-99, Train A Inlet Dmpr
	Standard	Places AO-N-99 in AUTO.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

32.	Procedure Step:	VERIFY OR PLACE the following dampers into the "AUTO" position: • AO-N-108, Train A Outl Dmpr
	Standard	Places AO-N-108 in AUTO.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

33.	**Procedure Step:**	VERIFY OR PLACE the following dampers into the "AUTO" position: • AO-N-112, Train B Outl Dmpr
	Standard	Observes AO-N-112 is in AUTO
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

CUE: **JPM is complete**

STOP TIME: _____

INITIAL CONDITIONS:

- The Reactor is at approximately 125 psig during a startup.
- Containment inerting preparations have started IAW PNPS 2.2.70 Att.8. The procedure is complete through Step 4.1[12]

INITIATING CUE:

Line up SGTS A train to inert containment IAW PNPS 2.2.70 Att.8 beginning at step 4.1[12].

NRC SIM JPM S7

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE (RO/SRO)

TITLE: **APRM "B" FUNCTIONAL TEST**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	20	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: A plant startup is in progress. The operator will perform the APRM 'B" functional test IAW 8.M.1-3.1 Att.2 Steps [5] thru [28].

TASK STANDARD: APRM B Functional Test; complete IAW 8.M.1-3.1, Attachment 2 through step 28 and APRM B out of Bypass. Task is performed in accordance with all system precautions and limitations and without failure of any critical elements.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
X Simulator
Control Room

Prepared: Tom Hooper **Date:** 8/17/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

Revision Number	Date	Description
0	08/30/10	New JPM to support the 2010 ILO Audit Exam
1	08/17/16	Updated JPM for 2017 NRC exam

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
APRM FUNCTIONAL TEST		215005 A4.03	3.2/3.3

REFERENCES:

PNPS 8.M.1-3.1 Att.2

SIMULATOR CONDITIONS:

1. Reset to IC-78.

GENERAL TOOLS AND EQUIPMENT:

1. 8.M.1-3.1, Attachment 2, and is complete through Step [4]

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. The task conditions are as follows:
   i) The plant is starting up.
   ii) APRM "B" Functional Test has begun IAW 8.M.1-3.1, Attachment 2, and is complete through Step [4]
   iii) For this JPM, an examiner/instructor will act as the C905 Panel Operator.
2. Solicit and answer any questions the operator may have.

INITIAL CONDITIONS:

- A plant startup is in progress.
- APRM "B" Functional Test has begun IAW 8.M.1-3.1, Attachment 2, and is complete through Step [4].

INITIATING CUE:

Perform APRM "B" Functional Test in accordance with 8.M.1-3.1, Attachment 2. Begin at procedure Step [5].

PERFORMANCE:

Notes This task is covered in procedure 8.M.1-3.1

All controls are located on panel C905 and C937.

All critical steps must be performed in order written unless otherwise noted

START TIME: _____

1.	Procedure Step:	[5] Set APRM "B" channel to "BYPASS".
	Standard	APRM 'B' bypassed
	Cue	If asked to bypass APRM "B", direct the operator to bypass APRM "B".
	Notes	
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	[6] VERIFY the APRM "B" BYPASS indication lights at Panels C905 and C937 are ON.
	Standard	Observes the APRM "B" BYPASS indication lights at Panels C905 and C937 are ON.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	[7] VERIFY the following: (a) The SET DOWN white light for APRM "B" channel at Panel C937 is ON.
	Standard	Observes the SET DOWN white light for APRM "B" channel at Panel C937 is ON.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

4.	**Procedure Step:**	[7] VERIFY the following: (b) CRD Scram Solenoid Group 1-4 lights at Panels C915 and C917 are ON.
	Standard	Observes the CRD Scram Solenoid Group 1-4 lights at Panels C915 and C917 are ON.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

5.	**Procedure Step:**	[7] VERIFY the following: (c) PERFORM Attachment 9 (RPS Reset Verification).
	Standard	Performs Attachment 9 by observing the following voltage indicators read approximately 62.5 VDC: • EI-302-19AA on Panel C915 • EI-302-19AB on Panel C915 • EI-302-19BB on Panel C917 • EI-302-19BA on Panel C917
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

6.	**Procedure Step:**	[8] POSITION APRM "B" meter function switch to "COUNT".
	Standard	At Panel C937, rotates APRM "B" meter function switch to "COUNT".
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

7.	**Procedure Step:**	(a) RECORD "As-Found" APRM "B" count value.
	Standard	Records "As-Found" APRM "B" count value.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

8.	**Procedure Step:**	[9] VERIFY that all LPRM card switches are in the "OP" position. IF LPRM card switches are in the "BY" position due to a faulty detector or other trouble, they will remain in the "BY" position (RECORD LPRMs found in BYPASS below).
	Standard	Observes all LPRM card switches are in the "OP" position.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

9.	**Procedure Step:**	[10] BYPASS additional LPRM card switches until a total of four LPRM inputs (including LPRM inputs already bypassed).
	Standard	Bypasses additional LPRM card switches to achieve a total of four LPRM inputs (including LPRM inputs already bypassed).
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

10.	**Procedure Step:**	[11] **VERIFY** APRM "B" local INOP light is ON **AND** APRM "B" meter indicates correct number of operable LPRM inputs. **RECORD** value below.
	Standard	Observes APRM "B" local INOP light is ON. Observes APRM "B" meter indicates 50%. Records "50%" in space provided.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

11.	**Procedure Step:**	(12) RETURN previously selected LPRM card switches to the "OPERATE" position except any identified in [9] above.

	Standard	Returns previously selected LPRM card switches to the "OPERATE" position.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

12.	**Procedure Step:**	(a) ACTUATE trip reset switch.
	Standard	Actuates the trip reset pushbutton for APRM "B".
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

13.	**Procedure Step:**	(b) RECORD "As-Left" APRM "B" count value.
	Standard	Records "100%" in space provided.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

14.	**Procedure Step:**	(c) VERIFY count value recorded in Step [8](a) agrees with count value recorded in Step [12](b).
	Standard	Observes both count values agree (100%).
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

15.	**Procedure Step:**	[13] VERIFY APRM "B" local INOP light is OFF.
	Standard	Observes APRM "B" local INOP light is OFF.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

16.	**Procedure Step:**	[14] PLACE the APRM "B" mode switch in the "STANDBY" position.
	Standard	Places the APRM "B" mode switch in the "STANDBY" position.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

17.	**Procedure Step:**	(a) VERIFY APRM "B" local INOP light is ON.
	Standard	Observes APRM "B" local INOP light is ON.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

18.	**Procedure Step:**	[15] PLACE the APRM "B" mode switch in the "TEST POWER" position.
	Standard	Places the APRM "B" mode switch in the "TEST POWER" position.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

19.	**Procedure Step:**	(a) RESET any local trips associated with APRM "B".
	Standard	Actuates the trip reset pushbutton for APRM "B".
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

20.	**Procedure Step:**	(b) VERIFY local alarm lights are CLEAR. (Power potentiometer may need to be adjusted to clear local alarms.)
	Standard	Observes local alarm lights are CLEAR (may adjust power potentiometer as needed).
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

21.	**Procedure Step:**	[16] POSITION the APRM "B" meter function switch to the "AVERAGE" position.
	Standard	Positions the APRM "B" meter function switch to the "AVERAGE" position.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

22.	**Procedure Step:**	[17] ADJUST the APRM "B" POWER potentiometer until the HIGH light comes on indicating the value of power signal that will initiate a rod block function.
	Standard	Adjusts the APRM "B" POWER potentiometer until the HIGH light comes on.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

23.	**Procedure Step:**	[18] RECORD the "As-Found" value of power. The setpoint for the HIGH or rod block function is 11 (10.5 to 11.5) percent power.
	Standard	Records the "As-Found" value of power in the space provided.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

24.	**Procedure Step:**	[19] ADJUST the APRM "B" POWER potentiometer until the HIGH-HIGH light comes on indicating the value of power signal that will initiate a Scram function.
	Standard	Adjusts the APRM "B" POWER potentiometer until the HIGH-HIGH light comes on.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

25.	**Procedure Step:**	[20] RECORD the "As-Found" value of power. The setpoint for the HIGH-HIGH or Scram function is 13 (12.5 to 13.5) percent power.
	Standard	Records the "As-Found" value of power in the space provided.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

26.	**Procedure Step:**	[21] LOWER the APRM "B" POWER adjustment to approximately 5 percent power.
	Standard	Lowers the APRM "B" POWER adjustment to approximately 5 percent power.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

27.	**Procedure Step:**	[22] RESET the APRM "B" trip functions.
	Standard	Actuates the trip reset pushbutton for APRM "B".
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

28.	**Procedure Step:**	[23] LOWER the APRM "B" POWER level adjustment until the local DNSCL light comes on indicating the value of power signal that will initiate a downscale function.
	Standard	Lowers the APRM "B" POWER level adjustment until the local DNSCL light comes on.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

29.	**Procedure Step:**	[24] RECORD the "As-Found" value of power. The setpoint for downscale is 3.0 (3.0 to 4.0) percent power, decreasing.
	Standard	Records the "As-Found" value of power in the space provided.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

30.	**Procedure Step:**	[25] RAISE the APRM "B" POWER level adjustment to approximately 5 percent power.
	Standard	Raises the APRM "B" POWER level adjustment to approximately 5 percent power.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

31.	**Procedure Step:**	[26] RESET the APRM "B" channel trip functions.
	Standard	Actuates the trip reset pushbutton for APRM "B".
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

32.	**Procedure Step:**	(a) VERIFY local alarms are CLEAR.
	Standard	Observes local alarms are CLEAR.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

33.	**Procedure Step:**	[27] PLACE the APRM "B" mode switch in the "OPERATE" position.
	Standard	Places the APRM "B" mode switch in the "OPERATE" position.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

34.	**Procedure Step:**	[28] REMOVE bypass from APRM "B" channel by placing APRM "B" channel bypass switch in "NEUTRAL" position (Panel C905).
	Standard	Unbypasses APRM B by taking joystick to "NEUTRAL" position.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

35.	**Procedure Step:**	(a) VERIFY BYPASS lights are OFF (local and Panel C905).
	Standard	Observes BYPASS lights are OFF (local and Panel C905).
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

Cue: **This completes this JPM.**

STOP TIME: _____

INITIAL CONDITIONS:

- The plant is starting up.
- APRM "B" Functional Test has begun IAW 8.M.1-3, Attachment 2, and is complete through Step [4].
- For this JPM, an examiner/instructor will act as the C905 Panel Operator.

INITIATING CUE:

Perform APRM "B" Functional Test in accordance with 8.M.1-3.1, Attachment 2. Begin at procedure Step [5].

NRC SIM JPM S8

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE (RO/SRO)

TITLE: **TEST PARTIAL CLOSURE OF MSIVs**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	**10**	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The operator will be told that the plant is operating with all four main steam lines open. The operator will be directed to conduct the MSIV partial closure test in accordance with PNPS procedure 8.7.4.5, Main Steam Isolation Valve Partial Stroke Exercise. When the operator tests AO-203-1C, INBD ISOL VLV, it will be observed that alarm "MSIV NOT FULL OPEN" does not clear once the valve reopens. The operator will be expected to perform the MSIV Partial Stroke test through Step 8.0[5](a), at which point the test will be stopped due to an abnormal indication (Precaution and Limitation 6.0[1]).

TASK STANDARD: The operator will conduct the MSIV partial closure test in accordance with PNPS procedure 8.7.4.5, Main Steam Isolation Valve Partial Stroke Exercise. When the operator tests AO-203-1C, INBD ISOL VLV, it will be observed that alarm "MSIV NOT FULL OPEN" does not clear once the valve reopens. The operator will perform the MSIV Partial Stroke test through Step 8.0[5](a), and stop the test. The system shall be operated in accordance with all applicable precautions and limitations. The procedure shall be followed without failure of critical elements.

EVALUATION METHOD:

X Perform
Simulate

EVALUATION LOCATION:

Plant
X Simulator
Control Room

Prepared: Tom Hooper **Date:** 8/16/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number	Date	Description
0	09/07/13	Revised JPM to reflect most recent procedures for 2014 LOT Audit Exam.
1	8/16/16	Updated for 2017 NRC exam.

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
PERFORM MSIV SURVEILLANCE VIA PUSHBUTTON	239-02-01-012	239001	A4.01 (4.2/4.0)

REFERENCES:

PNPS 8.7.4.5, Main Steam Isolation Valve Partial Stroke Exercise

SIMULATOR CONDITIONS:

1. Initialize the simulator to IC-77. Verify the following is preset:
2. Crywolf alarm MSIV NOT FULL OPEN (C905R-D2) to True Conditioned off AO-203-1C, INBD ISOL VLV Green Light Illuminating.
3. Override the green lights (2 – one by control switch and one by vertical mimic) for MSIV AO-203-1C to ON Conditioned off AO-203-1C, INBD ISOL VLV Green Light Illuminating.

GENERAL TOOLS AND EQUIPMENT:

1. Handout 1: Blank copy of PNPS 8.7.4.5, Main Steam Isolation Valve Partial Stroke Exercise with Prerequisite section 7.0 signed off.

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin."
2. Always state the following two paragraphs:
   a) The title of this JPM is: **TEST PARTIAL CLOSURE OF MSIVs**
   b) The task conditions are as follows:
      - The plant is operating with all four main steam lines open.
      - PNPS 8.7.4.5, Main Steam Isolation Valve Partial Stroke Exercise, is scheduled to be performed on this shift.
      - A Verifier is standing by to verify the MSIV position as needed.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

Conduct the MSIV partial closure test in accordance with PNPS procedure 8.7.4.5, Main Steam Isolation Valve Partial Stroke Exercise.

(Grey shaded denotes Critical Steps)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.

START TIME: _____

1.	**Procedure Step:**	Note prior to [1] TEST push buttons for exercising are located on Panel C903. Releasing the TEST push button at the 90% open position satisfies the requirement for MSIV exercising and is evident by any of the following: • Observation of dual open/close light indication (apron AND vertical section). • Actuation of the alarm "MSIV NOT FULL OPEN" (C905R-D2). • Observation of MSIV stem movement of between 1/4 and 5/8 inch. • Observation of alarm "AUTO SCRAM CHAN A" (C905R-A1) in alarm or alarm • "AUTO SCRAM CHAN B" (C905R-A4) in alarm during performance of PNPS 8.M.1-14 Attachment 1 or Attachment 2.
	Standard	The operator reads the Note, and proceeds.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	Cautions prior to [1] Excessive closing of MSIV while at power could result in inadvertent full closure of the valve due to the large differential pressure created. Monitor steam flow through the line being tested. If steam flow decreases, immediately release the TEST push button. If visual verification of MSIV stem movement is planned during this surveillance, then ensure all personnel are aware of the need to minimize any time spent in the area of the Main Steam Lines for ALARA considerations.
	Standard	The operator reads the Cautions, and proceeds.
	Cue	
	Notes	
	Results	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	[1] PERFORM exercise of AO-203-1A, INBD ISOL VLV: [1.a] PRESS TEST push button AO-203-1A AND RELEASE TEST push button upon obtaining positive indication of MSIV stem movement. [1.b] VERIFY OPEN AO-203-1A. Verification is required.
	Standard	The operator depresses "TEST" pushbutton for AO-203-1A and observes dual position indication (RED and GREEN lights are ON) and releases TEST pushbutton. (Critical) The operator observes AO-203-1A RED light is ON, GREEN light is OFF and/or annunciator C905 D2 "MSIV NOT FULL OPEN" clear. (Non-critical) The operator requests the verifier to verify the position of AO-203-1A. (Non-critical)
	Cue	Initial as Verifier.
	Notes	Releasing the TEST pushbutton at the 90% open position as evident by dual open/close light indication (apron AND vertical section) and/or actuation of the alarm "MSIV NOT FULL OPEN" D2 on Panel C905R satisfies the requirement for MSIV exercising. The verifications that follow are not critical.
	Results	SAT ☐ UNSAT ☐

4.	**Procedure Step:**	[2] PERFORM exercise of AO-203-2A, OUTBD ISOL VLV: [2](a) PRESS TEST push button AO-203-2A AND RELEASE TEST push button upon obtaining positive indication of MSIV stem movement. [2](b) VERIFY OPEN AO-203-2A. Verification is required.
	Standard	The operator depresses "TEST" pushbutton for AO-203-2A and observes dual position indication (RED and GREEN lights are ON) and releases TEST pushbutton. (Critical) The operator observes AO-203-2A RED light is ON, GREEN light is OFF but that alarm C905 D2 "MSIV NOT FULL OPEN" clear. (Non-critical) The operator requests the verifier to verify the position of AO-203-2A. (Non-critical)
	Cue	Initial as Verifier.
	Notes	Releasing the TEST pushbutton at the 90% open position as evident by dual open/close light indication (apron AND vertical section) and/or actuation of the alarm "MSIV NOT FULL OPEN" D2 on Panel C905R satisfies the requirement for MSIV exercising. The verifications that follow are not critical.
	Results	SAT ☐ UNSAT ☐

5.	**Procedure Step:**	[3] PERFORM exercise of AO-203-1B, INBD ISOL VLV: [3] a. PRESS TEST push button AO-203-1B AND RELEASE TEST push button upon obtaining positive indication of MSIV stem movement. [3] b. VERIFY OPEN AO-203-1B. Verification is required.
	Standard	The operator depresses "TEST" pushbutton for AO-203-1B and observes dual position indication (RED and GREEN lights are ON) and releases TEST pushbutton. (Critical) The operator observes AO-203-1B RED light is ON, GREEN light is OFF and/or annunciator C905 D2 "MSIV NOT FULL OPEN" clear. (Non-critical) The operator requests the verifier to verify the position of AO-203-1B. (Non-critical)
	Cue	Initial as Verifier.
	Notes	Releasing the TEST pushbutton at the 90% open position as evident by dual open/close light indication (apron AND vertical section) and/or actuation of the alarm "MSIV NOT FULL OPEN" D2 on Panel C905R satisfies the requirement for MSIV exercising. The verifications that follow are not critical.
	Results	SAT ☐ UNSAT ☐

6.	**Procedure Step:**	[4] PERFORM exercise of AO-203-2B, OUTBD ISOL VLV: [4](a) PRESS TEST push button AO-203-2B AND RELEASE TEST push button upon obtaining positive indication of MSIV stem movement. [4](b) VERIFY OPEN AO-203-2B. Verification is required.
	Standard	The operator depresses "TEST" pushbutton for AO-203-2B and observes dual position indication (RED and GREEN lights are ON) and releases TEST pushbutton. (Critical) The operator observes AO-203-2B RED light is ON, GREEN light is OFF and/or annunciator C905 D2 "MSIV NOT FULL OPEN" clear. (Non-critical) The operator requests the verifier to verify the position of AO-203-2B. (Non-critical)
	Cue	Initial as Verifier.
	Notes	Releasing the TEST pushbutton at the 90% open position as evident by dual open/close light indication (apron AND vertical section) and/or actuation of the alarm "MSIV NOT FULL OPEN" D2 on Panel C905R satisfies the requirement for MSIV exercising. The verifications that follow are not critical.
	Results	SAT ☐ UNSAT ☐

7.	**Procedure Step:**	[5] PERFORM exercise of AO-203-1C, INBD ISOL VLV: [5][a] PRESS TEST push button AO-203-1C AND RELEASE TEST push button upon obtaining positive indication of MSIV stem movement. [5][b] VERIFY OPEN AO-203-1C. Verification is required.
	Standard	The operator depresses "TEST" pushbutton for AO-203-1C and observes the RED light is ON, GREEN light is OFF, and releases TEST pushbutton. (Critical) The operator observes AO-203-1C RED light is ON, GREEN light is OFF but that alarm C906 D2 "MSIV NOT FULL OPEN" does NOT clear. (Non-critical) The operator informs the CRS, and stops the test based on Precaution 6.6.[1]: If any abnormal condition is indicated during the test, terminate the test at once and investigate the condition. (Critical)
	Cue	As CRS, acknowledge. If asked how to proceed, Role Play as CRS and ask what the operator recommends. Agree with any action the operator recommends.
	Notes	If the operator continues with the test past this Step, the JPM is failed.
	Results	SAT ☐ UNSAT ☐

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- The plant is operating with all four main steam lines open.
- PNPS 8.7.4.5, Main Steam Isolation Valve Partial Stroke Exercise, is scheduled to be performed on this shift.
- A Verifier is standing by to verify the MSIV position as needed.

INITIATING CUE:

Conduct the MSIV partial closure test in accordance with PNPS procedure 8.7.4.5, Main Steam Isolation Valve Partial Stroke Exercise.

NRC

In-Plant JPM P1

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE
(ALTERNATE PATH) (NL/RO/SRO)

TITLE: **MANUAL TRANSFER OF B-6 (Alternate Path)**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	20	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The reactor is operating at 100% power. Upon momentary loss of B1, B6 failed to transfer to B2. Breaker 52-102 failed to open and will not open with Control Switch and requires the Breaker Pushbutton to be used.

TASK STANDARD: Energize B6 from B2 IAW PNPS 2.4.B.6. There shall be no failure of critical elements.

EVALUATION METHOD:

	Perform
X	Simulate

EVALUATION LOCATION:

X	Plant
	Simulator
	Control Room

Prepared: Tom Hooper **Date:** 8/17/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number:	Description:
0	New JPM
1	Updated for 2017 NRC exam

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
Perform NLNPO Responsibilities on Electrical Distribution System Malfunctions	200-05-04-070	295003	3.7/3.8 AA1.01
Energize/De-Energize Buses (A5; A6; B1; B2; B6)	262-01-01-007		

REFERENCES:

PNPS 2.4.B.6

SIMULATOR CONDITIONS:

1. N/A

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be simulated. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. Always state the following two paragraphs:
   a) "The title of this JPM is: Manual Transfer of B6."
   b) "The task conditions are as follows:
      i) A momentary loss of B1 has occurred.
      ii) B-6 failed to transfer to Bus B2
      iii) Off-normal procedure 2.4.B.6 has been entered."
3. Solicit and answer any questions the operator may have.

INITIATING CUE:
State the following:

"[Operator's name], IAW PNPS procedure 2.4.B.6 step 4.2.1[2], transfer B6 to B2. Inform me when you have completed this task."

PERFORMANCE:

Notes Transferring B6 to B1 is covered in Section 4.2.1, Step [1] of procedure 2.4.B6.

All critical steps must be performed in order written unless otherwise noted.

START TIME: _____

1.	**Procedure Step:**	Both B1 **AND** B2 Live – Perform Step 4.2.1[1] **OR** 4.2.1[2]
		CAUTION At buses B1, B2 and B6, for normal breaker operation of breakers 52-102, 52-202, 52-601 and 52-602, use manual control switch located at top of bus. DO NOT use pushbutton on front of transfer breakers except to open the breaker, if necessary. DO NOT use pushbutton to close the breaker in the "TEST" position. It will cause loss of B6.
		At Bus B1, **RACK IN OR CHECK** breaker 52-102 racked into "CONN" position, **THEN OPEN OR CHECK OPEN** the breaker.
	Standard	Operator locates breaker 52-102 and verifies breaker is racked into "CONN" position by observing mechanical indicator.
	Cue	Mechanical indicator reads "CONN".
	Notes	Bus B-1 is located in Turbine Building, 37' in the Upper Switchgear Room.
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	**THEN OPEN OR CHECK OPEN** the breaker (52-102)
	Standard	Operator checks to see if breaker 52-102 is open and determines breaker is closed and attempts to open Breaker 52-102 via control switch at the top of the bus.
	Cue	Initially - "Red light is ON, Green light is OFF, and CLOSED flag is showing." When operator attempts to Open breaker 52-102 via the control switch the breaker does not open. CUE "Red light is ON, Green light is OFF, and CLOSED flag is showing."
	Notes	IF operator uses pushbutton instead of the control switch mark this step N/A proceed to Step 3.
	Results	SAT ☐ N/A ☐ UNSAT ☐

3.	Procedure Step:	THEN OPEN OR CHECK OPEN the breaker (52-102)
	Standard	Operator checks to see if breaker 52-102 is open and determines breaker is Closed and Operator Opens 52-102 via the Pushbutton on the front of the transfer breaker 52-102.
	Cue	Initially - "Red light is ON, Green light is OFF, and CLOSED flag is showing." When operator depresses the pushbutton on breaker 52-102 the breaker Opens. CUE "Red light is OFF, Green light is ON, and OPEN flag is showing."
	Notes	Caution states DO NOT use pushbutton on front of transfer breaker except to open the breaker, if necessary
	Results	SAT ☐ UNSAT ☐

4.	**Procedure Step:**	At bus B6, **RACK IN OR CHECK** breaker 52-601 racked into "CONN" position, **THEN OPEN OR CHECK OPEN** the breaker.
	Standard	Operator locates breaker 52-601 and verifies breaker is racked into "CONN" position by observing mechanical indicator.
	Cue	"Mechanical indicator reads "CONN".
	Notes	Bus B6 is located in Turbine Building, 23' in the Cable Spreading Room.
	Results	SAT ☐ UNSAT ☐

5.	**Procedure Step:**	**THEN OPEN OR CHECK OPEN** the breaker (52-601)
	Standard	Operator checks to see if breaker 52-601 is open. Operator determines that 52-601 is OPEN
	Cue	"Green light is ON, Red light is OFF, and Open flag is showing"
	Notes	
	Results	SAT ☐ UNSAT ☐

6.	**Procedure Step:**	At bus B6, **RACK IN OR CHECK** breaker 52-602 racked into "CONN" position, **THEN CLOSE OR CHECK CLOSED** the breaker.
	Standard	Operator locates breaker 52-602 and verifies breaker is racked into "CONN" position by observing mechanical indicator.
	Cue	"Mechanical indicator reads "CONN".
	Notes	Bus B6 is located in Turbine Building, 23' in the Cable Spreading Room.
	Results	SAT ☐ UNSAT ☐

7.	**Procedure Step:**	**THEN CLOSE OR CHECK CLOSED** the breaker (52-602)
	Standard	Operator checks to see if breaker 52-602 is Closed. Operator determines that 52-602 is CLOSED.
	Cue	"Initially Red light is ON, Green light is OFF, and CLOSED flag is showing",
	Notes	
	Results	SAT ☐ UNSAT ☐

8.	**Procedure Step:**	At bus B2, **RACK IN OR CHECK** breaker 52-202 racked into "CONN" position, **THEN CLOSE OR CHECK CLOSED** the breaker.
	Standard	Operator locates breaker 52-202 and verifies breaker is racked into "CONN" position by observing mechanical indicator.
	Cue	"Mechanical indicator reads "CONN".
	Notes	Bus B-2 is located in Turbine Building, 23' in the Lower Switchgear Room.
	Results	SAT ☐ UNSAT ☐

9.	**Procedure Step:**	**THEN CLOSE OR CHECK CLOSED** the breaker (52-202)
	Standard	Operator checks to see if breaker 52-202 is Closed. Operator determines that 52-202 is OPEN and CLOSES 52-202 using the Manual control switch at the top of the bus.
	Cue	Initially – "Red light is OFF, Green light is ON, and OPEN flag is showing" When control switch at the top of the bus is taken to Closed then CUE "Red light is ON and Green light is OFF and CLOSED flag is showing"
	Notes	(Caution states DO NOT use pushbutton on front of transfer breaker except to open the breaker, if necessary) BUS B-6 is indicating voltage. This completes this JPM
	Results	SAT ☐ UNSAT ☐

STOP TIME: _____

INITIAL CONDITIONS:

- A momentary loss of B1 has occurred.
- B-6 failed to transfer to Bus B2
- Off-normal procedure 2.4.B.6 has been entered."

INITIATING CUE:

"[Operator's name], IAW PNPS procedure 2.4.B.6 step step 4.2.1[2], transfer B6 to B2. Inform me when you have completed this task."

NRC

In-Plant JPM P2

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE
(RO/SRO)

TITLE: **Reactor Scram and Feedwater Pump Trip from Outside Control Room**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	**15**	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The operator will be told that the Reactor is operating at 50% power and the Main Control Room has been evacuated due to a fire. A scram needs to be performed from outside the control room and Feedwater pumps A and C must be tripped.

TASK STANDARD: The operator will scram the Reactor from outside the control room without causing inadvertent actuations. Feedwater pumps A and C will be tripped. The scram and Feedwater pump trips will be accomplished in accordance with all system precaution and limitations and per PNPS 2.4.143 without failure of any critical elements.

EVALUATION METHOD:

	Perform
X	Simulate

EVALUATION LOCATION:

X	Plant
	Simulator
	Control Room

Prepared: Tom Hooper **Date:** 8/17/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number	Date	Description
	08/17/16	Updated for 2017 NRC exam from 2007 NRC exam.

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
	200-05-01-014	295016	AA1.01 3.8/3.9

REFERENCES:

PNPS 2.4.143, Shutdown from Outside Control Room

SIMULATOR CONDITIONS:

NA

GENERAL TOOLS AND EQUIPMENT:

1. PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)
2. Handout 1: PNPS 2.4.143 complete up to step 4.0[16]
3. "S" key for panel C-511 (CR-50)

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin."
2. Always state the following two paragraphs:
   a) The title of this JPM is: **Reactor Scram and Feedwater Pump Trip from Outside Control Room**
   b) The task conditions are as follows:
      - The Reactor is operating at 50% power.
      - The Main Control Room was evacuated due to a fire before a Reactor scram could be performed.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

Scram the Reactor and trip Feedwater pumps A and C from outside the control room per PNPS 2.4.143 starting at step 4.0[16].

(Grey shaded denotes Critical Steps)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

1.	**Procedure Step:**	[16] VERIFY Subsequent Actions Steps 4.0[1] through [6] are complete. IF NOT complete, PERFORM the following steps as required to complete Subsequent Actions: (a) OPEN the following breakers on RPS Power Panel C511 to Scram the Reactor and close the MSIVs: • Reactor Protection System Logic Channel A, Bkr A3 (TB 23' RPS MG Room)
	Standard	Unlocks and opens panel C511. Pushes handle down to the OFF position for breaker A3.
	Cue	The indicated breaker has snapped down.
	Notes	
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	(a) OPEN the following breakers on RPS Power Panel C511 to Scram the Reactor and close the MSIVs: • Reactor Protection System Logic Channel B, Bkr B3 (TB 23' RPS MG Room)
	Standard	Pushes handle down to the OFF position for breaker B3.
	Cue	The indicated breaker has snapped down.
	Notes	
	Results	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	(b) CLOSE the RPS power breakers on RPS Power Panel C511: • Reactor Protection System Logic Channel A, Bkr A3 (TB 23' RPS MG Room)
	Standard	Pushes handle up to the ON position for breaker A3.
	Cue	The indicated breaker has snapped up.
	Notes	
	Results	SAT ☐ UNSAT ☐

4.	**Procedure Step:**	(b) CLOSE the RPS power breakers on RPS Power Panel C511: • Reactor Protection System Logic Channel B, Bkr B3 (TB 23' RPS MG Room)
	Standard	Pushes handle up to the ON position for breaker B3.
	Cue	The indicated breaker has snapped up.
	Notes	
	Results	SAT ☐ UNSAT ☐

5.	**Procedure Step:**	(c) IF necessary, VENT SPVAH in accordance with PNPS 5.3.23...
	Standard	Determines venting SPVAH is not required and continues in procedure.
	Cue	If asked, report that venting SPVAH is not required.
	Notes	
	Results	SAT ☐ UNSAT ☐

6.	**Procedure Step:**	(d) TRIP the Reactor Feed Pumps at their 4160V AC breakers (IF control power is NOT available, REFER TO Appendix G): • RFP A - Bkr A101 (TB 37' Upper Switchgear Room)
	Standard	Trips breaker A101 on Bus A1.
	Cue	The breaker has tripped. Green light on red light off
	Notes	If the operator begins to don protective clothing, ask why. If the operator states that they must open the breaker door to trip the breaker, tell them to simulate opening the breaker door and describes what actions they would be taking. It is possible to trip the breaker from inside the door. However, the preferred method is using the control switch on the outside of the breaker door.
	Results	SAT ☐ UNSAT ☐

7.	**Procedure Step:**	(d) TRIP the Reactor Feed Pumps at their 4160V AC breakers (IF control power is NOT available, REFER TO Appendix G): • RFP C - Bkr A102 (TB 37' Upper Switchgear Room)
	Standard	Trips breaker A102 on Bus A1.
	Cue	The breaker has tripped. Green light on red light off
	Notes	
	Results	SAT ☐ UNSAT ☐

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: PNPS 2017 NRC In-Plant JPM P2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The Reactor is operating at 50% power.
- The Main Control Room was evacuated due to a fire before a Reactor scram could be performed.

INITIATING CUE:

Scram the Reactor and trip Feedwater pumps A and C from outside the control room per PNPS 2.4.143 starting at step 4.0[16].

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.

NRC

In-Plant JPM P3

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE (RO/SRO)

TITLE: **SHIFT CRD FLOW CONTROL VALVES**

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	**N/A**	Actual Time (min):	**N/A**
PERFORMANCE TIME:	Average Time (min):	**12**	Actual Time (min):	

JPM RESULTS*: SAT UNSAT NEEDS IMPROVEMENT
(Circle one) *Refer to Grading Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The operator will be told that the reactor is operating at power, and that the in-service CRD Flow Control Valve, FCV-302-6A has failed closed and the cause is believed to be failure of the E/P positioner. The operator will be directed to changeover to the 'B' CRD Flow Control Valve in service in accordance with Attachment 5, CRD Flow Control Valve Failure, of PNPS 2.4.11.1, CRD System Malfunctions. The operator will be expected to place the 'B' CRD Flow Control Valve in accordance with Attachment 5 of PNPS 2.4.11.1.

TASK STANDARD: The operator will changeover to the 'B' CRD Flow Control Valve in service in accordance with Attachment 5, CRD Flow Control Valve Failure, of PNPS 2.4.11.1, CRD System Malfunctions. The system shall be operated in accordance with all applicable precautions and limitations. The procedure shall be followed without failure of critical elements.

EVALUATION METHOD:

Perform
X Simulate

EVALUATION LOCATION:

X Plant
Simulator
Control Room

Prepared: Tom Hooper **Date:** 8/17/16

Reviewed: _____ **Date:** _____

Approved: _____ **Date:** _____
Superintendent, Operations Training (or Designee)

REVISION LOG

Revision Number	Date	Description
9	8/22/05	Description: Updated to current rev of procedure and reformatted
10	2/1/07	Update procedure revision.
11	10/04/07	Corrected operator brief for simulated actions.
12	10/16/09	Changed procedural references to 2.4.11.1 vice 2.2.87 to simulate an abnormal condition and procedure entry vice normal CRD FCV changeout.
13	09/08/13	Revised JPM to reflect most recent procedures for 2014 LOT Audit Exam.
14	08/17/16	Updated JPM for 2017 NRC exam.

TASK Title:	Task Number	K&A SYSTEM:	K&A RATING:
SHIFT CRD FLOW CONTROL VALVE	201-01-04-012	201001	A2.07 (3.2/3.2)

REFERENCES:

PNPS 2.4.11.1, CRD System Malfunctions

SIMULATOR CONDITIONS:

NA

GENERAL TOOLS AND EQUIPMENT:

1. PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)
2. Handout 1: Attachment 5, CRD Flow Control Valve Failure, of PNPS 2.4.11.1, CRD System Malfunctions.

CRITICAL ELEMENTS:

Critical elements are shaded in gray within the body of this document.

OPERATOR BRIEF:

1. State the following paragraph IF this is the first performance in this setting:
   a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin."
2. Always state the following two paragraphs:
   a) The title of this JPM is: **SHIFT CRD FLOW CONTROL VALVES**
   b) The task conditions are as follows:
      - The reactor is operating at power.
      - The in-service CRD Flow Control Valve, FCV-302-6A has failed closed and the cause is believed to be failure of the E/P positioner.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

The CRS has directed you to changeover to the 'B' CRD Flow Control Valve in service in accordance with Attachment 5, CRD Flow Control Valve Failure, of PNPS 2.4.11.1, CRD System Malfunctions.

(Grey shaded denotes Critical Steps)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

1.	**Procedure Step:**	[1] Failure of in-service flow control valve (A or B) or E/P positioner [1](a) PLACE the CRD FLOW CONTROL controller on Panel C905 to "MANUAL" AND, using the potentiometer, POSITION the controller to full "CLOSED".
	Standard	The operator simulates contacting the Control Room and verifies the controller is in manual and the CRD FCV is fully closed.
	Cue	The CRD flow controller is in manual and both CRD FCVs indicate fully closed.
	Notes	
	Results	SAT ☐ UNSAT ☐

2.	**Procedure Step:**	[2] At Flow Control Valve Station: [2](a) SLOWLY OPEN standby flow control valve inlet valve 301-40A (B).
	Standard	The operator simulates slowly opening 301-40B (handwheel counterclockwise).
	Cue	The valve handwheel is turning and nominal resistance is felt. The valve stops turning.
	Notes	
	Results	SAT ☐ UNSAT ☐

3.	**Procedure Step:**	[2](b) SLOWLY OPEN outlet valve 301-41A (B) from standby flow control valve.
	Standard	The operator simulates slowly opening 301-41B (handwheel counterclockwise).
	Cue	The valve handwheel is turning and nominal resistance is felt. The valve stops turning.
	Notes	
	Results	SAT ☐ UNSAT ☐

4.	**Procedure Step:**	[2](c) CLOSE outlet valve 301-41A (B) from in-service flow control valve.
	Standard	The operator simulates closing 301-41A (handwheel clockwise).
	Cue	The valve handwheel is turning and nominal resistance is felt. The valve stops turning.
	Notes	
	Results	SAT ☐ UNSAT ☐

5.	**Procedure Step:**	[2](d) CLOSE inlet valve 301-40A (B) for the previously in-service flow control valve.
	Standard	The operator simulates closing 301-40A (handwheel clockwise).
	Cue	The valve handwheel is turning and nominal resistance is felt. The valve stops turning.
	Notes	
	Results	SAT ☐ UNSAT ☐

6.	**Procedure Step:**	[2](e) On the local valve control panel, PERFORM the following: [2](e)(1) SWAP selector switch 3B-S1, for electrical signal to E/P unit, from valve in-service to standby valve position.
	Standard	The operator simulates aligning the selector switch to "B" position.
	Cue	The selector switch has moved to the standby "B" valve position.
	Notes	
	Results	SAT ☐ UNSAT ☐

7.	**Procedure Step:**	[2](e)(2) SWAP valve 3-HO-301-29 from valve in-service position to that of standby valve FCV-302-6A, Position 1 (FCV-302-6B, Position 2).
	Standard	The operator simulates aligning valve 3-HO-301-29 to Position 2.
	Cue	Valve 3-HO-301-29 is in Position 2.
	Notes	
	Results	SAT ☐ UNSAT ☐

8.	**Procedure Step:**	[2](f) NOTIFY the Control Room that flow control valves have been swapped over locally.
	Standard	The operator simulates notifying the control room.
	Cue	As the CRS, acknowledge.
	Notes	
	Results	SAT ☐ UNSAT ☐

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: PNPS 2017 NRC In-Plant JPM P3

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- The reactor is operating at power.
- The in-service CRD Flow Control Valve, FCV-302-6A has failed closed and the cause is believed to be failure of the E/P positioner.

INITIATING CUE:

The CRS has directed you to changeover to the 'B' CRD Flow Control Valve in service in accordance with Attachment 5, CRD Flow Control Valve Failure, of PNPS 2.4.11.1, CRD System Malfunctions.

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.

Facility: Pilgrim Scenario No.: NRC-1 Op-Test No.: 2017

Examiners: _____ Operators: _____

Initial Conditions: The plant is operating at approximately 100% power. Core Spray pump A is out of service for maintenance. Instrument Air Compressor K-110 is out of service for maintenance. The 345KV ring bus has been interrupted by a trip of ACB-105. The cause of the trip has been corrected.

Turnover: Re-establish the 345KV ring bus per PNPS 2.2.1 section 7.3.2.3, starting at step [2]. A switching order has been obtained.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Re-establish the 345KV Ring Bus 2.2.1
2	RC07	I – SRO	RCIC Inverter Failure ARP C904L-A4, Technical Specifications
3	RD05	C – RO, SRO	CRD Pump Trip 2.4.4
4	RD07	R – RO, SRO	Control Rod Drifts Out 2.4.11, Technical Specifications
5	TC06	C – BOP, SRO	EPR Oscillation 2.4.37, Technical Specifications
6	RD07	C – All	Two Additional Control Rods Drift Out 2.4.11, 2.1.6, EOP-1
7	RP14 AT02	M – All	RPS A Fails to Scram, ARI Fails to Insert Control Rods EOP-2
8	RR29 RR30 AT03	I – RO	Reactor Recirculation Pumps Fail to Runback / Trip EOP-2
9	LP01	C – RO, SRO	Delayed Trip of Standby Liquid Control Pumps EOP-2
10	Overrides	C – BOP, SRO	Main Turbine Trips, Turbine Bypass Valves Drift Closed EOP-2

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

Facility: **Pilgrim**	Scenario No.: **NRC-1**	Op-Test No.: **2017**
1. Total malfunctions (5-8) **Events 2, 3, 4, 5, 6, 7, 8, 9, 10**	9	
2. Malfunctions after EOP entry (1-2) **Events 8, 9, 10**	3	
3. Abnormal events (2-4) **Events 3, 4, 5, 6**	4	
4. Major transients (1-2) **Event 7**	1	
5. EOPs entered/requiring substantive actions (1-2) **EOP-1**	1	
6. EOP contingencies requiring substantive actions (0-2) **EOP-2**	1	
7. Critical tasks (2-3)	2	
CRITICAL TASK DESCRIPTIONS: **CT-1: Given a failure to scram with Reactor power above 3%, the crew will lower Reactor power by one or more of the following methods, in accordance with EOP-2:** • **Terminating and preventing all RPV injection except SLC, RCIC, and CRD** • **Tripping Recirculation pumps** • **Injecting boron** **CT-2: Given a failure to scram, the crew will initiate Control Rod insertion, in accordance with EOP-2.**		

Scenario Summary:

The crew will assume the shift with the plant at approximately 100% power. The 345KV ring bus will be interrupted by an earlier trip of ACB-105. The crew will begin by re-establishing the 345KV ring bus per PNPS 2.2.1 section 7.3.2.3, starting at step [2].

The RCIC inverter will fail. The crew will execute the corresponding ARP. The SRO will declare RCIC inoperable and determine the Technical Specification impact.

CRD pump A will trip. The crew will execute PNPS 2.4.4, CRD Pump Trip. The CRD flow control valve will be closed, CRD pump B will be started, and normal CRD system operating parameters will be restored.

Control rod 18-43 will begin to drift out. The crew will execute PNPS 2.4.11, CRD Positioning Malfunctions. The RO will attempt to stop the drifting control rod by giving it an insert signal. The control rod will continue to drift out. The crew will lower Reactor power and the RO will apply a continuous insert signal to the control rod to fully insert it. The crew will disarm the control rod's HCU to keep it at position 00. The SRO will determine the Technical Specification impact.

The EPR will develop an oscillation, causing Reactor power and pressure will oscillate. The crew will execute PNPS 2.4.37, Turbine Control System Malfunctions. The BOP will place the MPR in control and secure the EPR. This will stabilize Reactor pressure control. The SRO will determine the Technical Specification impact of the loss of the backup pressure regulator.

Two more control rods will drift out. The crew will attempt to scram the Reactor based on the immediate actions of PNPS 2.4.11, CRD Positioning Malfunctions. An electrical failure to scram will occur (RPS fails to de-energize and ARI fails). The crew will execute EOP-02, RPV Control - Failure to Scram. They will take actions to initially lower power by reducing Recirc flow, tripping Recirc pumps, injecting SLC, and intentionally lowering Reactor water level (Critical Task). The crew will execute PNPS 5.3.23, Alternate Control Rod Insertion, to insert control rods (Critical Task). Control rods can be successfully inserted using multiple methods, such as using RMCS, drifting control rods by raising cooling water pressure, or venting the scram air header.

E-Plan Classification:

Site Area Emergency based on EAL SS2.1: An automatic scram failed to shutdown the reactor and manual actions taken at the reactor control console do not shutdown the reactor as indicated by reactor power ≥3%.

Setup:

- Initialize the simulator to IC-71.
- Open and execute LP "NRC Scenario 1". Trigger the step labeled "Setup".
- Verify Core Spray pump A control switch is in pull-to-lock with a caution tag hanging.
- Verify ACB 105 is open and green flagged.
- Prepare procedures:
  - PNPS 2.2.1 section 7.3.2.3, starting at step [2]
  - A switching order for re-establishing the ring bus

Op Test No.: 2017 Scenario # 1 Event # 1 Page 4 of 17

Event Description: Re-establish the 345KV Ring Bus

Time	Position	Applicant's Actions or Behavior

IOS Instructions:

1. The previously executed LP steps performed the following:
   a. Tripped Core Spray pump A and opened the DC knife blade.
   b. Placed Instrument Air compressor K-110 out of service.
   c. Failed RPS A scram capability.
   d. Failed both divisions of ARI.
   e. Failed RRP runbacks / trips.
   f. Setup triggers to trip SLC pumps 60 seconds after start.
   g. Setup triggers to allow RRPs to be manually tripped.
   h. Setup a trigger to trip the Main Turbine when Reactor power drops <35%.
   i. Setup a trigger to close all TBVs over 30 seconds when Reactor power drops <10%.

Evaluator Note:	*The critical elements of each critical task are highlighted in grey.*	
	SRO	• Direct the BOP to re-establish the ring bus per PNPS 2.2.1 section 7.3.2.3, starting at step [2]
	RO	• Monitor plant parameters
	BOP	• **WHEN** re-establishing the ring bus after ACB-104 or ACB-105 opened due to protective relaying **AND** the cause is known **AND** proper authority is obtained to reclose, **THEN MOMENTARILY PLACE** ACB-104 or ACB-105 control switch to "TRIP" to clear ACB-104 or ACB-105 trip alarm • For ACB-105 closure only, at Panel C654 in the Relay House, **RESET/VERIFY RESET** ACB-105 Trip Failure Lockout Relay (86BF/105) and ACB-105 Block Closing Lockout Relay (86BC/105) • At Panel C3, **TURN** to the "ON" position ACB-105 SYNC switch • **TURN** selected ACB control switch to "CLOSE" • **OBSERVE** balanced generator amps and three phase voltage • **TURN** to the "OFF" position the selected ACB SYNC switch

IOS Operator: When directed by Lead Examiner, proceed to next event.

Op Test No.: 2017 Scenario # 1 Event # 2 Page 5 of 17

Event Description: RCIC Inverter Failure

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 2". This inserts malfunction RC07 for RCIC inverter failure. 2. If directed to check breaker status, report that Breaker 3 in Panel D4 is tripped. Breakers 72-165 and 72-16A in Panel D16 are both closed.		
	ANY	• Recognize / report annunciator C904L-A4, RCIC INVERTER FAILURE
	SRO	• Direct ARP execution • Declare RCIC inoperable and declare a 14 day LCO per Tech Spec 3.5.D.2
	BOP	• Execute ARP C904L-A4: • Determine that the Inverter did not reset. • Monitor RCIC System status; refer to PNPS 2.2.22 (RCIC System) as necessary • Dispatch NLO to check Breaker 3 in Panel D4 for 125V DC power to the RCIC inverter • Dispatch NLO to check Breakers 72-165 and 72-16A in Panel D16 for 125V DC power to 125V DC Distribution Panel A
IOS Operator: When directed by Lead Examiner, proceed to next event.		

Op Test No.: 2017 Scenario # 1 Event # 3 Page 6 of 17

Event Description: CRD Pump Trip

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 3". This inserts malfunction RD05 to trip CRD pump A.		
	RO	• Recognize / report annunciator C905R-A5, CRD PUMP A TRIP
	SRO	• Direct entry into PNPS 2.4.4, CRD Pump Trip
	RO	• Executes PNPS 2.4.4, CRD Pump Trip: • TRANSFER CRD flow controller (FIC-340-1) to MANUAL AND CLOSE the Flow Control Valve by rotating the controller manual potentiometer fully counterclockwise • VERIFY that the in-service Flow Control Valve is closed by observing the green C905 valve position light for FLOW CONTROL VLV A FCV-302-6A • START the standby CRD pump • IF the standby pump starts, THEN PERFORM the following: • WHEN the CRD pump discharge pressure (C905 CHG HDR PRESS, PI-340-3) AND pump amps (C905 3B-MIB) stabilize, THEN BALANCE the deviation meter on the CRD flow controller by slowly rotating the manual potentiometer clockwise while observing system flow • WHEN the deviation meter indicator is in the "green band" on the CRD flow controller, THEN TRANSFER the CRD flow controller to "AUTO"
IOS Operator: When directed by Lead Examiner, proceed to next event.		

Op Test No.: 2017 Scenario # 1 Event # 4 Page 7 of 17

Event Description: Control Rod Drifts Out

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 4". This inserts malfunction RD07 to drift out control rod 18-43. 2. If directed to disarm control rod 26-43, wait 2 minutes, then execute LP step labeled "Delete rod drift and valve out HCU". This will allow the rod to stop drifting and stay at position 00.		
	RO	• Recognize / report annunciator C905L-A3, ROD DRIFT • Recognize / report control rod 26-43 is drifting out
	SRO	• Direct entry into PNPS 2.4.11, CRD Positioning Malfunctions • Determine that control rod 26-43 is in operable • Refer to Tech Spec 3.3.B.C • Determine that the rod must be fully inserted within 3 hours and disarmed within 4 hours • Direct control rod 26-43 fully inserted and disarmed
	RO	• Executes PNPS 2.4.11, CRD Positioning Malfunctions: • Immediate Actions: • Determine no other control rod movements or Recirc flow changes are in progress. • ATTEMPT TO STOP the drifting rod by applying a drive signal opposite to the direction of travel. o Report that the rod continues to drift out • Determine no other control rod is drifting • Subsequent Actions: • Refer to Attachment 2 for Rod Drift • LOWER Reactor power by reducing core flow to approximately 43 Mlb/hr in accordance with PNPS 2.1.14 Section 7.11 • APPLY a drive signal AND INSERT the control rod to position 00 *(Evaluator Note: An insert signal must be maintained in order to maintain the rod fully inserted.)*

Op Test No.: 2017 Scenario # 1 Event # 4 Page 8 of 17

Event Description: Control Rod Drifts Out

Time	Position	Applicant's Actions or Behavior
		• WHEN the control rod is fully inserted, THEN PERFORM PNPS 2.2.87.2 to determine whether a stuck/dirty collet is the cause of the rod drift, as time permits • CONTACT Reactor Engineering for control rod pattern evaluation and further power maneuvers guidance • After control rod is disarmed, release Rod Control or Emergency In switch • Report control rod remains at 00 • Reset control rod drift alarm
IOS Operator: When directed by Lead Examiner, proceed to next event.		

Op Test No.: 2017 Scenario # 1 Event # 5 Page 9 of 17

Event Description: EPR Oscillation

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 5". This inserts malfunction TC06 to cause EPR oscillations.		
	ANY	• Recognize / report Reactor pressure and power oscillations • Recognize / report a Turbine control malfunction
Critical Task #1	**Given an inadvertently open SRV, close the SRV, in accordance with PNPS 2.4.29.**	
	SRO	• Direct entry into PNPS 2.4.37, Turbine Control System Malfunctions • Determine the backup pressure regulator has been lost • Determine that Tech Spec 3.11.C.1 requires that action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the steady state MCPR is not returned to within the prescribed limits within two (2) hours, reduce thermal power to < 25% within four (4) hours. *Evaluator Note: The Station Transient Analysis assumes operable backup pressure regulation. Upon the loss of backup pressure regulation (i.e., MPR or EPR), Technical Specifications surveillance requirement 4.11.C.1 for MCPR cannot be considered satisfied and an entry into Technical Specifications LCO 3.11.C.1 is required.*
	BOP	• Execute PNPS 2.4.37, Turbine Control System Malfunctions: *Evaluator Note: Immediate actions to scram or lower Reactor power are not anticipated to be applicable due to the severity of the malfunction and the earlier power reduction.* • ATTEMPT TO TAKE CONTROL of Reactor pressure with the MPR by holding the MPR SET PT control switch in the "LOWER" position • IF MPR takes control, THEN PLACE the EPR POWER control switch to the "OFF" position • CLOSELY MONITOR Reactor pressure and control valve operation while MPR/BPVOJ is controlling pressure • ASSESS operating conditions by plotting power versus core flow on the Pilgrim Power/Flow Map. THEN PERFORM the actions required in accordance with PNPS 2.1.14 Section 7.10

Op Test No.: 2017 Scenario # 1 Event # 5 Page 10 of 17

Event Description: EPR Oscillation

Time	Position	Applicant's Actions or Behavior
		• DEMAND a SOLOMON case from 3D Monicore AND VERIFY the following: o Core Decay Ratio (DR) is < 0.70 o Hot Channel Decay Ratio is < 0.55 • IF backup pressure regulation has been lost, THEN entry into Technical Specifications LCO 3.11.C.1 is required. REFER TO Discussion Step 5.0[1] • CHECK PRMs on Panel C910 and PRM recorders on Panel C902 to ensure fuel integrity • IF pressure is under control, THEN RETURN Reactor pressure to a setpoint appropriate for the current power level (REFER TO Attachment 2, Vessel Dome Pressure versus Core Power): • MONITOR Reactor pressure; PR-640-28, Narrow Range Reactor Pressure Recorded, is preferred • ADJUST Reactor pressure using the "in control" Pressure Regulator Setpoint control switch • IF Reactor power is ≥ 25%, THEN REFER TO Attachment 2 for the Reactor pressure operating band
IOS Operator: When directed by Lead Examiner, proceed to next event.		

Op Test No.: 2017 Scenario # 1 Event # 6-10 Page 11 of 17

Event Description: Two Additional Control Rods Drift Out; RPS A Fails to Scram, ARI Fails to Insert Control Rods; Reactor Recirculation Pumps Fail to Runback / Trip; Delayed Trip of Standby Liquid Control Pumps; Main Turbine Trips, Turbine Bypass Valves Drift Closed

Time	Position	Applicant's Actions or Behavior

IOS Instructions:

1. Execute LP step labeled "Event 6". This inserts malfunction RD07 to drift control rods 34-19 and 34-35 out. The rest of the scenario events will automatically follow:
   a. Each SLC pump will trip after running for 60 seconds.
   b. When Reactor power drops <35%, the Main Turbine will trip.
   c. When Reactor power drops <10%, the TBVs will fail closed over 30 seconds.
2. When directed to bypass the MSIV Lo-Lo level isolation, wait ~3 minutes and then defeat the isolation using remote functions.
3. If directed to vent the Scram Air Header wait approximately 15 minutes and then remove the RPS failure that is preventing the automatic scram
4. If directed to close the CRD charging header block valve CRD 25, wait ~3 minutes and then close the valve using the remote function.
5. If directed to defeat RPS wait approximately 15 minutes and then remove the RPS failure that is preventing the automatic scram

	RO	• Recognize / report annunciator C905L-A3, ROD DRIFT • Recognize / report two control rods are drifting out • Manually scram the Reactor (Immediate Action of PNPS 2.4.11) • Recognize / report failure to scram
Critical Task #1	**Given a failure to scram with Reactor power above 3%, the crew will lower Reactor power by one or more of the following methods, in accordance with EOP-02:** • **Terminating and preventing all RPV injection except SLC, RCIC, and CRD** • **Tripping Recirculation pumps** • **Injecting boron**	
Critical Task #2	**Given a failure to scram, the crew will initiate Control Rod insertion, in accordance with EOP-02.**	
	SRO	• Enter EOP-01 due to required scram and power >3%

Op Test No.: 2017 Scenario # 1 Event # 6-10 Page 12 of 17

Event Description: Two Additional Control Rods Drift Out; RPS A Fails to Scram, ARI Fails to Insert Control Rods; Reactor Recirculation Pumps Fail to Runback / Trip; Delayed Trip of Standby Liquid Control Pumps; Main Turbine Trips, Turbine Bypass Valves Drift Closed

Time	Position	Applicant's Actions or Behavior
		• Answer "Has reactor scram been initiated?" YES • Answer "Can existing rod pattern always assure reactor shutdown?" NO • Exit EOP-01 and enter EOP-02 • Verify initial actions of EOP-02 power leg • Direct Reactor pressure controlled 900-1050 psig • Direct Reactor water level controlled -20 to +10" *Examiner Note: The control bands above are specified in procedure 5.3.35.2* • Direct verification of Isolations, ECCS initiations EDG initiation • Direct ADS be inhibited • Direct bypassing MSIV low water level isolation • Direct that Standby Liquid Control be injected o Acknowledge trip of SLC pump(s) • Direct all injections to the RPV be stopped and prevented except boron, RCIC and CRD • Direct that level be lowered to less than -25" • Direct injection be re-established to maintain level < -25" using outside the shroud injection systems *Examiner Note: Use of the Feed system is expected.* • May expand the water level control band to -100 inches to -150 inches using the Fuel Zone Level indicators following defeat of the MSIV Lo-Lo isolation *Examiner Note: The above action is recommended in procedure 5.3.35.2.* • Direct control rods inserted per PNPS 5.3.23, Alternate Rod Insertion • When Torus temperature exceeds 80°F, enter EOP-03 • Direct initiation of Torus cooling, as time permits • Acknowledge status of control rod insertion • If/when all control rods are inserted, exit EOP-02 and re-enter EOP-01 o Direct Reactor water level restored to a band of +12 to +45"

Op Test No.: 2017 Scenario # 1 Event # 6-10 Page 13 of 17

Event Description: Two Additional Control Rods Drift Out; RPS A Fails to Scram, ARI Fails to Insert Control Rods; Reactor Recirculation Pumps Fail to Runback / Trip; Delayed Trip of Standby Liquid Control Pumps; Main Turbine Trips, Turbine Bypass Valves Drift Closed

Time	Position	Applicant's Actions or Behavior
	RO	• Place mode switch to shutdown • Initiate ARI • Reduce Recirc Pump speed to minimum • Trip or verify tripped both Recirc pumps • Report reactor power level to SRO *Examiner Note: The above actions are Immediate Actions from PNPS 5.3.23, Alternate Rod Insertion and also the initial actions of EOP-02, Power Leg* • Report that the core is beginning to oscillate • Set FWLC Master Controller to +5" to control water level in specified band • Inject SLC: o START one SLC System by placing the SLC ACTUATE switch to "SYS A" OR "SYS B" position at Panel C905 o VERIFY the following: o Alarm "SQUIB VLV CONTINUITY FAILURE" (C905R-A9) is ON o SQUIB VALVE CONTINUITY light for the selected system is OFF o Red STANDBY LIQUID CONTROL PUMP A or PUMP B motor running light for the selected system is ON o Reactor Cleanup System isolation o Pump discharge pressure on PI-1140-I, INJ HDR PRESS, (Panel C905) is slightly greater than Reactor pressure o Reactor power decreasing o Recognize / report trip of SLC pump o Start other SLC pump o Recognize / report trip of 2nd SLC pump • Terminate Feedwater as follows: o CLOSE the Feedwater Regulating Valves AND CLOSE the Startup Feedwater Regulating Valve (It IS NOT necessary to secure feed and condensate pumps at this time.) o FV-642A, Feedwater Regulating Valve "A" o FV-642B, Feedwater Regulating Valve "B" o HIC-640-20, Startup Reg Flow Control

Op Test No.: 2017 Scenario # 1 Event # 6-10 Page 14 of 17

Event Description: Two Additional Control Rods Drift Out; RPS A Fails to Scram, ARI Fails to Insert Control Rods; Reactor Recirculation Pumps Fail to Runback / Trip; Delayed Trip of Standby Liquid Control Pumps; Main Turbine Trips, Turbine Bypass Valves Drift Closed

Time	Position	Applicant's Actions or Behavior
	RO cont.	○ 1st Point Heater Outlet Block Valve MO-3479 ○ 1st Point Heater Outlet Block Valve MO-3480 • Report when level is less than –25" • Executes PNPS 5.3.23, Alternate Rod Insertion: *Examiner Note: Multiple methods are available to insert control rods. It is not expected that all methods be used. Any one method is enough to satisfy the critical task.* • Determines Section 3.1, General Actions, and Section 3.2, Electrical Failure are to be performed concurrently: • May commence manually inserting control rods as follows: ○ VERIFY RUNNING OR START one CRD Pump ○ CLOSE 301-25, CRD Charging Water Supply Valve (CRD Mezzanine) ○ BYPASS the Rod Worth Minimizer ○ INCREASE drive water differential pressure to 400 psid by throttling closed MO-302-8, DRIVE WTR PCV ○ Drive water differential pressure may be increased in 50 psi increments up to a maximum of 600 psid as needed to facilitate rod insertion ○ RAPIDLY INSERT all steps of the RPR Array to position 00 using the EMERG. IN switch ○ WHEN all control rods of the RPR Array have been inserted/attempted inserted, THEN INSERT the remaining control rods as follows: ○ SELECT control rods not fully inserted. ○ INSERT control rods to form a checkerboard in a spiral pattern from the outside to the center. ○ AFTER the checkerboard pattern is formed, THEN INSERT the remaining control rods in a spiral pattern from the outside to the center • INSERT all IRMs and SRM detectors. • SELECT two SRMs for recording. • PLACE all eight APRM/IRM selector switches to "IRM"

Op Test No.: 2017 Scenario # 1 Event # 6-10 Page 15 of 17

Event Description: Two Additional Control Rods Drift Out; RPS A Fails to Scram, ARI Fails to Insert Control Rods; Reactor Recirculation Pumps Fail to Runback / Trip; Delayed Trip of Standby Liquid Control Pumps; Main Turbine Trips, Turbine Bypass Valves Drift Closed

Time	Position	Applicant's Actions or Behavior
	RO cont.	• May attempt to DE-ENERGIZE the Scram solenoids as follows: o OBTAIN keys from the Shift Manager's Office AND PLACE all of the following RPS CHAN test switches in the "TRIP" position: ▪ 5A-S2B (Panel C917) - Key CR-46 ▪ 5A-S2D (Panel C917) - Key CR-47 ▪ 5A-S2A (Panel C915) - Key CR-41 ▪ 5A-S2C (Panel C915) - Key CR-42 • May direct NLO to vent the scram air header o WHEN control rod insertion is completed OR control rods are not moving inward, THEN direct NLO to RESTORE Scram air header • May INCREASE CRD cooling water differential pressure as follows: o VERIFY RUNNING OR START one CRD Pump o THROTTLE OPEN MO-302-8, DRIVE WTR PCV o CLOSE 301-25, CRD Charging Water Supply Valve (CRD Mezzanine) o INCREASE system flow through FCV-302-6A (B), FLOW CONTROL VLV A (B), via FIC-340-1, CRD FLOW CONTROL o WHEN control rod insertion is completed OR control rods do not move inward, THEN PERFORM the following: ▪ ESTABLISH normal system drive pressure and cooling water flow. ▪ OPEN 301-25, CRD Charging Water Supply Valve • Report status of control rod insertion • If/when all control rods are inserted, raise Reactor water level as directed
	BOP	• Report Group 2, 6 isolations, RBIS and Standby Gas Treatment Start • Inhibit ADS • Terminate ECCS as follows:

Op Test No.: 2017 Scenario # 1 Event # 6-10 Page 16 of 17

Event Description: Two Additional Control Rods Drift Out; RPS A Fails to Scram, ARI Fails to Insert Control Rods; Reactor Recirculation Pumps Fail to Runback / Trip; Delayed Trip of Standby Liquid Control Pumps; Main Turbine Trips, Turbine Bypass Valves Drift Closed

Time	Position	Applicant's Actions or Behavior
		○ IF HPCI IS NOT running, THEN PLACE the Aux Oil Pump (P-229) in the PULL-TO-LOCK position. ○ PLACE RHR Pumps and Core Spray pumps in the PULL-TO-LOCK position *Examiner Note: Procedure 5.3.35.1 allows leaving RHR pumps in containment control modes provided that they are secured before RPV pressure lowers to the injection pressure of ~300 psig* • After Main Turbine trips, augment Reactor pressure control with SRVs as necessary • After TBVs fail closed, control Reactor pressure in directed band with SRVs • Report when Torus temperature exceeds 80°F (EOP-03 entry condition) • May begin placing Torus cooling in service, as time permits *Examiner Note: It is not expected for the scenario to run long enough for the crew to put Torus cooling in service.*

The scenario may be terminated at the discretion of the Lead Examiner OR when Reactor power has been lowered, control rod insertion is in progress / completed, and Reactor water level is being controlled in the correct band.

E-Plan Classification:

Site Area Emergency based on EAL SS2.1: An automatic scram failed to shutdown the reactor and manual actions taken at the reactor control console do not shutdown the reactor as indicated by reactor power ≥3%.

SHIFT TURNOVER

- The plant is operating at approximately 100% power.
- Core Spray pump A is out of service for maintenance. This is day 1 of 7 for the TS 3.5.A.2 LCO.
- Instrument Air compressor K-110 is out of service for maintenance.
- The 345KV ring bus has been interrupted by a trip of ACB-105. The cause of the trip has been corrected.
- Directions to the shift are to:
    - Re-establish the 345KV ring bus per PNPS 2.2.1 section 7.3.2.3, starting at step [2]. A switching order has been obtained.

Facility: Pilgrim Scenario No.: NRC-2 Op-Test No.: 2017

Examiners: _____ Operators: _____

Initial Conditions: The plant is operating at approximately 80% power. Core Spray pump A is out of service for maintenance. Instrument Air Compressor K-110 is out of service for maintenance. Feedwater pump B has a lube oil leak that requires securing the pump.

Turnover: Lower Reactor power to 75% using Recirculation flow (43 Mlbm/hr) and control rods (ROPS). PNPS 2.1.14 section 7.4 is in progress up to step [5]. Secure Feedwater pump B per PNPS 2.2.96 section 7.3.4.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R – RO, SRO	Lower Power with Recirculation Flow and Control Rods 2.1.14, 2.2.84, 2.2.88
2	N/A	N – BOP, SRO	Remove Feedwater Pump B from Service 2.1.14, 2.2.96
3	RR11	C – RO, SRO	Reactor Recirculation Pump A High Vibrations ARP C904RC-B6, 2.4.17, Technical Specifications
4	ED17	I – BOP, SRO	Loss of Power to Instrument Bus Y-4 5.3.19, Technical Specifications
5	RR13 RR14 Override	C – All	Reactor Recirculation Pump B Seal Failures and Failure to Isolate 2.4.22, 2.4.17, 2.1.6, EOP-1, EOP-3
6	PC01	M – All	Coolant Leak in Drywell EOP-1, EOP-3, EOP-17
7	ED13 FW21	C – All	4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B EOP-1
8	HP02 AD01	C – All	HPCI Trips, ADS Fails to Actuate EOP-1
9	CS01 RH04	C – BOP, SRO	Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open EOP-1

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

Facility: **Pilgrim**	Scenario No.: **NRC-2**	Op-Test No.: **2017**
1. Total malfunctions (5-8) **Events 3, 4, 5, 6, 7, 8, 9**	7	
2. Malfunctions after EOP entry (1-2) **Events 7, 8, 9**	3	
3. Abnormal events (2-4) **Events 3, 4, 5**	3	
4. Major transients (1-2) **Event 6**	1	
5. EOPs entered/requiring substantive actions (1-2) **EOP-1, EOP-3**	2	
6. EOP contingencies requiring substantive actions (0-2) **EOP-1 Alt. Level Control, EOP-17**	2	
7. Critical tasks (2-3)	3	
CRITICAL TASK DESCRIPTIONS: **CT-1: Given a coolant leak inside the Containment, the crew will spray the Drywell, in accordance with EOP-3.** **CT-2: Given a coolant leak, a loss of high pressure injection systems, and the inability to restore and maintain Reactor water level above the Top of Active Fuel (TAF), the crew will initiate actions for an Emergency RPV Depressurization, in accordance with EOP-1.** **CT-3: Given a coolant leak and a failure of injection systems to maintain Reactor water level, the crew will restore and/or maintain Reactor water level above the Top of Active Fuel, in accordance with EOP-1.**		

Scenario Summary:

The crew will assume the shift with the plant at approximately 80% power. A lube oil leak on Feedwater pump B requires lowering Reactor power and securing the pump. The crew will lower Reactor power to 75% using Recirculation flow (43 Mlbm/hr) and control rods (ROPS). PNPS 2.1.14 section 7.4 is in progress up to step [5]. Then the crew will secure Feedwater pump B per PNPS 2.2.96 section 7.3.4.

Reactor Recirculation pump A will develop high vibrations. The crew will respond per the alarm response procedure by changing pump speed in an attempt to clear the condition. When vibrations exceed 3 mils, the crew will trip the pump and enter PNPS 2.4.17, Recirculation Pump Trip, to establish single loop operation. The SRO will address Technical Specifications for single loop operation.

A failure will result in loss of power to Instrument Panel Y4. The crew will enter PNPS 5.3.19, Loss of 120V AC Safeguard Buses Y4 and Y41. Actions will include initiating a Reactor Building isolation and responding to a RWCU isolation. Multiple control room indications and controls will be lost. The SRO will address Technical Specifications.

The seals for Reactor Recirculation pump B will sequentially degrade until leakage occurs into the Drywell. The crew will enter PNPS 2.4.22, Failure of Recirculation Pump Seal. Once the seals degrade enough, the crew will scram the Reactor, trip Reactor Recirculation pump B, and attempt to isolate the pump. The pump discharge valve will fail to close, leaving the leak un-isolated.

Following the scram, 4160 VAC Bus A-2 fails to transfer. This results in loss of many different loads, including Condensate pumps A and C. Additional coolant leakage into the Drywell will develop shortly after the scram and further degrade Primary Containment conditions. The crew will enter EOP-1, RPV Control, and EOP-3, Primary Containment Control. The crew will spray the Torus and then the Drywell **(Critical Task)**.

8 minutes after the scram, Condensate pump B will trip, resulting in a loss of all Feedwater. HPCI will trip shortly after starting injection. These losses of high pressure injection will leave only RCIC, SLC, and CRD available. The coolant leakage will exceed makeup capability and Reactor water level will lower to the top of active fuel. The crew will perform an Emergency RPV Depressurization **(Critical Task)**. Following depressurization, Core Spray pump B will trip shortly after starting injection and the LPCI injection valves will fail to automatically open. The crew will manually inject with LPCI to restore Reactor water level **(Critical Task)**.

E-Plan Classification:

Site Area Emergency based on EAL FS1.1: Loss or potential loss of any two barriers.

Setup:

- Initialize the simulator to IC-72.
- Open and execute LP "NRC Scenario 2". Trigger the step labeled "Setup".
- Verify Core Spray pump A control switch is in pull-to-lock with a caution tag hanging.
- Prepare procedures:
  - PNPS 2.1.14 section 7.4 is in progress up to step [5].
  - PNPS 2.2.96 section 7.3.4 will be performed.

Op Test No.: 2017 Scenario # 2 Event # 1 Page 4 of 26

Event Description: Lower Power with Recirculation Flow and Control Rods

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. The previously executed LP steps labeled "Setup" and "Events 7-9 Presets" performed the following: a. Tripped Core Spray pump A and opened the DC knife blade. b. Placed Instrument Air compressor K-110 out of service. c. Fails Bus A2 auto transfer. d. Fails automatic ADS initiation. e. Fails LPCI injection valves from automatically opening.		
Evaluator Note:	*The critical elements of each critical task are highlighted in grey.*	
	SRO	• Direct the RO to lower power to 75% using Recirculation flow (43 Mlbm/hr) and control rods (ROPS)
	RO	• To lower Reactor power using core flow (43Mlbm/hr), PERFORM the following on the selected Recirc Speed Controller SIC-262-025A OR SIC-262-025B: o ENSURE the selected Recirc Speed Controller is in MANUAL by observing that an "M" is illuminated to the right of the bar graphs. o ENSURE the RIGHT BAR (Speed Demand) is selected by observing that the dot above the RIGHT BAR is illuminated. o MOMENTARILY DEPRESS the down (▼) push button on the left side of the control pad. o OBSERVE the RIGHT BAR (Speed Demand) indication lowers. o SELECT the CENTER BAR (Actual Speed) AND OBSERVE the numeric indication lowers to match the speed demand numeric output signal of the RIGHT BAR. o CONTINUE TO REPERFORM Steps above until the desired Reactor power or core flow is obtained. • Insert control rods as required to achieve ~ 75% power (ROPS)
	BOP	• Monitor plant parameters
IOS Operator: Crew proceeds to the next event upon completion.		

Op Test No.: 2017 Scenario # 2 Event # 2 Page 5 of 26

Event Description: Remove Feedwater Pump B from Service

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Role play as required as NLO in field.		
	SRO	• Direct BOP to remove Feedwater pump B from service.
	RO	• Monitor plant parameters
	BOP	• Secures Feedwater pump B per PNPS 2.2.96, Attachment 16: o RECORD the RFP to be secured: o PLACE/VERIFY the RFP TRIP SEQUENCE ENABLE switch is in the "OFF" position. o WHEN total feedwater flow is ≤ 75%, THEN STOP the selected RFP by placing the control switch on Panel C1 to the "STOP" position: o VERIFY Reactor water level is stable o VERIFY on the remaining operating Reactor Feed Pumps Motor Current Indicators amps are normal (< 650 amps) o VERIFY Auxiliary L.O. Pump for the selected RFP auto-starts: o VERIFY the selected RFP Recirculation Valve closes: o Direct the NLO to perform the following: o Secure hydrogen injection to the RFP o AFTER RFP coast down is complete for the selected RFP, THROTTLE the TBCCW outlet valves from the lube oil coolers to maintain temperatures of 90°F to 110°F
IOS Operator: When directed by the Lead Examiner, proceed to the next event.		

Op Test No.: 2017 Scenario # 2 Event # 3 Page 6 of 26

Event Description: Reactor Recirculation Pump A High Vibrations

Time	Position	Applicant's Actions or Behavior
		IOS Instructions: 1. Execute LP step labeled "Event 3". Step inserts malfunction RR11 for RRP 11 high vibes. 2. When requested to report the status of the local vibration alarm report that the vibration is pegged high.
	Crew	• Recognize / report C904RC-B6, PUMP MOTOR A VIBRATION HI
	SRO	• Direct execution of ARP C904RC-B6 • Direct trip of RRP A when vibration exceeds limits • Direct entry into PNPS 2.4.17, Recirculation Pump Trip • Direct entry into PNPS 2.4.165, REACTOR CORE INSTABILITY, upon notification that the Reactor is operating in the Unanalyzed Region
	RO	• Execute ARP C904RC-B6: • Attempt to reset vibration monitor by depressing vibration monitor reset button on Panel C904 **Procedure CAUTION** • Avoid core flows less than 31.5 Mlb/hr with Reactor power greater than the 80% load line. • Do not raise speed of affected pump by more than 10% of original speed. • Maintain required speed/flow relationship between pumps in accordance with Tech Spec 3.6.F • Raise or lower Recirc Pump A speed in increments • Attempt to reset vibration monitor at each increment • When Recirc Pump A speed is reduced to minimum OR increased by greater than 10% AND the vibration limits exceed the values specified in PNPS 2.2.84 Section 7.16 (3 mils), THEN trip Recirc Pump A

Op Test No.: 2017 Scenario # 2 Event # 3 Page 7 of 26

Event Description: Reactor Recirculation Pump A High Vibrations

Time	Position	Applicant's Actions or Behavior
		Applicable Immediate Actions of PNPS 2.4.17
	RO/SRO	**Procedure CAUTIONS** **If the Exclusion Region on the Pilgrim Single Loop Power/Flow Map is entered as a result of this transient, then Operators are required to take immediate actions in accordance with PNPS 2.1.14 Section 7.10 to exit the Exclusion Region.** **Increasing core flow by starting a tripped Recirculation Pump is an unacceptable method of exiting the Exclusion Region.** • IF at any time during single recirculation loop power operation it is determined that the power/flow relationship is outside of the analyzed limits on the Pilgrim Single Loop Power/Flow Map, THEN action shall be initiated within 15 minutes to restore operation to within the prescribed limits and be within the prescribed limits within 2 hours. *(Examiner Note: Core flow will be determined via a subsequent step. Once determined, the immediate action will then apply.)*
		Applicable Subsequent Actions of PNPS 2.4.17
	RO/BOP	• CLOSE MO-202-5B, PUMP DISCH VLV. ESTIMATE total core flow (TCF) by performing the following: • OBTAIN AND RECORD total core flow from EPIC points SLCORFLO and REC052 (EPIC Group Point Display #22). • USE current Reactor power AND PLOT both of the calculated flow values on the Pilgrim Single Loop Power/Flow Map • COMPARE plotted values to determine forward/reverse flow. • Determine and report that reverse flow exists and that the reactor is operating in the Unanalyzed Region of the Power to flow Map.

Op Test No.: 2017 Scenario # 2 Event # 3 Page 8 of 26

Event Description: Reactor Recirculation Pump A High Vibrations

Time	Position	Applicant's Actions or Behavior
		Applicable Actions of 2.4.165 *(Examiner Note: It is not necessary to observe all of the following activities prior to proceeding as a Reactivity Maneuver has already been observed. The following actions are provided should the exam team decide additional monitoring is required.)*
	RO	• Monitor for core thermal-hydraulic instability • Exit the Unanalyzed and Exclusion Regions as follows: • VERIFY/REDUCE the total calculated core flow is less than 43 Mlb/hr. • INSERT control rods using the RPR array to exit the Exclusion Region AND be within the SLO analyzed area on the Pilgrim Single Loop Power/Flow Map. Note: the following steps are contained in PNPS 9.13, Attachment 8 **PROCEDURE CAUTIONS** • DO NOT exit from any step in RPR array without inserting all rods in that step unless specific guidance is provided by Reactor Engineering. • DO NOT deviate from the step sequence specified in the RPR array. • AVOID reducing core thermal power below 25% of rated. **PROCEDURE NOTE** • CRD drive pressure may be increased 50 psid above the normal drive pressure (250 psid) without entering PNPS 2.4.11.1 to expedite control rod insertion. • FULLY INSERT control rods listed in Step 1 of RPR Array Sheet in any order using Emergency In continuous rod insertion for each rod. • The C905 Reactor Operator shall verify that control rods in Step 1 of the RPR Array Sheet are fully inserted AND initial in the indicated location. • DETERMINE whether a further Reactor power reduction is required. IF following PNPS 5.3.23, INSERT all steps of the RPR array. *(Examiner Note: 5.3.23 is an ATWS response procedure and is not applicable)* • REPEAT Steps above for subsequent steps in RPR array until the desired power reduction has been obtained or until directed otherwise by the Shift Manager. *(Examiner Note: A least two steps will be required)*

Op Test No.: 2017 Scenario # 2 Event # 3 Page 9 of 26

Event Description: Reactor Recirculation Pump A High Vibrations

Time	Position	Applicant's Actions or Behavior
Recirc Pump Trip Follow - Up Actions – PNPS 2.4.17		
	SRO	• Direct that core flow be verified or adjusted to within the required band of 27.6 to 35.9 Mlbm/hr • VERIFY APRM operability by ensuring PNPS 8.M.1-3, "APRM Functional (Scram Clamp Normal)", is within its surveillance frequency for all six APRMs. (REFER TO Tech Spec Table 3.1.1.) • MONITOR the idle recirculation loop suction temperature in accordance with Attachment 6 of PNPS 2.2.84, "Reactor Recirculation System". • ENSURE that idle loop temperature does not drop below 400°F.
	RO	• WHEN at least 5 minutes have elapsed since the closure of the Recirculation Pump Discharge Valve (MO-202-5A) THEN OPEN the discharge valve to maintain the idle loop suction temperature > 400°F.
	BOP	• PLACE the toggle switch (PULL OUT AND REPOSITION) for each APRM Flow Control Trip Reference (FCTR) card into the "SLO" position: *(Examiner Note: APRM "B" is the only fully simulated APRM)*
IOS Operator: When directed by Lead Examiner, proceed to next event.		

Op Test No.: 2017 Scenario # 2 Event # 4 Page 10 of 26

Event Description: Loss of Power to Instrument Bus Y-4

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 4". This inserts malfunction ED 17 for loss of Y4. 2. When asked to check Transformer X56, report that the Main Power Disconnect switch is ON. Delay any further action requested (if asked, say you are briefing/getting PPE). 3. When asked to check FLEX Transfer Switch N18115, report that it is in the "NORM" position.		
	ANY	Recognize / report loss of Instrument Bus Y-4
	SRO	• Direct entry into PNPS 5.3.19, Loss of 120V AC Safeguard Buses Y4 and Y41 • Determines Tech Spec 3.5.A requires cold shutdown within 24 hours
	RO	• Monitor plant parameters
	BOP	• Executes PNPS 5.3.19, Loss of 120V AC Safeguard Buses Y4 and Y41: • INITIATE a full RBIS isolation by placing RBIS TEST LOGIC/TRIP keylock switches for Channels A and B to "ISOLATE" at Panel C7. • AFTER the isolation, RETURN the switches to "STANDBY". • MONITOR Steam Tunnel temperatures. • MAXIMIZE portable ventilation to the Steam Tunnel. • IF Steam Tunnel temperature approaches 160 degrees F, THEN MANUALLY SCRAM the Reactor AND CONCURRENTLY PERFORM PNPS 2.1.6, *"Reactor Scram"*. • VERIFY RWCU Pump(s) trips AND COMPLETE the Group 6 Isolation in accordance with PNPS 2.2.125.1, *"Reset of Primary and Secondary Containment Isolations (Group I, II, III, IV, V, VI, and VII)"*: o WHEN the Group VI isolation occurs, THEN VERIFY the following valves are as indicated below (Panel C904): ▪ MO-1201-2 CLOSE ▪ MO-1201-5 CLOSE ▪ MO-1201-80 CLOSE o CLOSE/VERIFY CLOSED the following valves: ▪ MO-1201-77, Reject to CRW Block Valve ▪ MO-1201-78, Reject to Condr Block Valve

Op Test No.: 2017 Scenario # 2 Event # 4 Page 11 of 26

Event Description: Loss of Power to Instrument Bus Y-4

Time	Position	Applicant's Actions or Behavior
		• COMPLETE the Group 2 Isolation in accordance with PNPS 2.2.125.1, *"Reset of Primary and Secondary Containment Isolations (Group I, II, III, IV, V, VI, and VII)": (Examiner Note: This includes many verifications at multiple panels.)* • Dispatch NLO to: o CHECK Transformer X56 (Cable Spreading Room). o CHECK FLEX Transfer Switch N18115 (Cable Spreading Room) is in "NORM" position.
IOS Operator: When directed by Lead Examiner, proceed to next event.		

Op Test No.: 2017 Scenario # 2 Event # 5 Page 12 of 26

Event Description: Reactor Recirculation Pump B Seal Failures and Failure to Isolate

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 5". This inserts malfunction RR13 to fail RRP B #1 seal 100% over 60 seconds. This inserts malfunction RR14 to fail RRP B #2 seal 80% over 60 seconds after a 3 minute delay.		
	BOP	• Recognize / report annunciator C904R-D5, Pump B Seal Staging Flow Hi o Check seal temperatures on TR -262-19 o Recognize PI-262-18B and 17B are equalized o Determine that #1 seal has been lost
	SRO	• Direct entry into PNPS 2.4.22, Recirc Pump Seal Failure and direct monitoring of drywell parameters.
Second Seal Fails		
	BOP	• Recognize / report annunciator C904R-C5, Pump B Seal Leakage Hi • Determine that the #2 seal is failing • Report slowly rising drywell temperature and pressure
Examiner Notes: • *Due to the earlier trip of RRP A, it is expected that the crew will manually scram the Reactor before tripping RRP B. If the crew trips RRP B first, a manually Reactor scram will become procedurally required per the Immediate Actions of PNPS 2.4.17, Recirc Pump Trip.* • *Once the Reactor is scrammed, the malfunctions of Events 6-9 will automatically occur sequentially. The remaining actions for the RRP B seal failure and immediate scram actions are scripted in this event. Further actions are scripted in the next events.*		
	SRO	• Determine that a catastrophic seal failure has occurred • Direct a Reactor scram per PNPS 2.1.6, Reactor Scram • Enter EOP-01, RPV Control when informed of EOP-01 entry condition • Direct pressure be controlled 900 to 1050 psig using TBVs • Direct that isolations and initiations be verified • Direct level be controlled +12 to +45" using Feedwater • Direct tripping and isolating RRP B per PNPS 2.4.22 • Acknowledge failure of RRP B discharge valve to close

Op Test No.: 2017 Scenario # 2 Event # 5 Page 13 of 26

Event Description: Reactor Recirculation Pump B Seal Failures and Failure to Isolate

Time	Position	Applicant's Actions or Behavior

	RO	**Immediate Scram Actions**
		
		APPLICABLE PROCEDURE NOTE
		While it is the intent of the Procedure to outline the many steps required following a Scram, the sequence suggested for steps may be altered to suit existing plant conditions.
		
		• At Panel C905, DEPRESS both manual Reactor Scram push buttons.
		• PLACE Reactor Mode switch in "SHUTDOWN".
		• VERIFY AND ANNOUNCE the status of APRM downscales.
		• VERIFY all control rods are fully inserted.
		
		(Evaluator Note: The simulator randomly selects a few control rods to go "beyond full-in" resulting in a loss of position indication. The Plant Process computer may take up to 3 minutes before an "ALL RODS In" indication is received.)
		
		• IF any control rod position cannot be determined AND the Reactor is shutdown, THEN SELECT each control rod not at position "00" AND ATTEMPT TO NOTCH INSERT the control rod to determine whether the control rod will settle at position "00".
		• In order to maintain availability of the Main Condenser, HPCI, and RCIC, PERFORM the following:
		  • CLOSE the Feedwater Regulating Valves and the Feedwater HP Block Valves (Panel C905):
		  • FC-642A, FLOW CONTROL VLV A
		  • FC-642B, FLOW CONTROL VLV B
		  • MO-3479, 1ST PT HTR OUTLET BLOCK VALVE
		  • MO-3480, 1ST PT HTR OUTLET BLOCK VALVE
		• Report when EOP-01, RPV Control, low RPV Level entry condition (< +12 inches) is exceeded.

	BOP	• TRIP RRP B • PLACE C/S for AO-5150B, Seal Wtr Block Vlv, to "CLOSE" • PLACE C/S for MO-202-4B, Pump Suct. Vlv, to "CLOSE" • WHEN MO-202-4B indicates CLOSED, THEN PLACE C/S for MO-202-5B, Pump Disch Vlv, to "CLOSE" • Recognize / report failure of 202-5B to close

Op Test No.: 2017 Scenario # 2 Event # 5 Page 14 of 26

Event Description: Reactor Recirculation Pump B Seal Failures and Failure to Isolate

Time	Position	Applicant's Actions or Behavior
		• Direct NLO to CLOSE F-008B Recirc Pump Purge Block Valve, as time permits • Report Group 2, 6, RBIS isolations, and Standby Gas Treatment start. Group 1 was manually initiated IAW PNPS 2.4.41
IOS Operator: The remaining events will automatically trigger when required.		

Op Test No.: 2017 Scenario # 2 Event # 6-9 Page 15 of 26

Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior
		IOS Instructions: 1. LP step labeled "Event 6 & 7" automatically initiates on the scram. This step: a. Inserts and ramps a coolant leak to 2200 gpm over 8 minutes. b. Trips Condensate pump B after 4 minutes. 2. LP step labeled "Event 8" automatically initiates when HPCI flow exceeds 100 gpm and trips the HPCI turbine. 3. LP step labeled "Event 9" automatically initiates when Core Spray B flow exceeds 100 gpm and trips Core Spray pump B.
	ANY	• Recognize / report failure of Bus A2 to transfer • Report rising drywell temperature and pressure • Report when drywell temperature exceeds 150 degrees and drywell pressure exceeds 2.2 psig
	SRO	• Direct Transfer of Bus A2 • Re-enter EOP-01 and enter EOP-03, Primary Containment Control
		EOP-03, Primary Containment Control, Entry
	SRO	• Direct that isolations and initiations be re-verified • Direct that drywell cooling be maximized • Before torus bottom pressure exceeds 16 psig, direct that torus sprays be initiated. • When operators become available direct that H2/O2 analyzers be placed in service. • Before RPV level lowers to -45 inches, direct ADS be inhibited
	BOP	• Report that all RHR pumps, CS B and both diesels started. • Inhibit ADS when directed
	SRO	**Aggressive Cooldown** • Determine that an aggressive cool down is required IAW PNPS 5.3.25.2, OPERATIONS EMERGENCY AND TRANSIENT

Op Test No.: 2017 Scenario # 2 Event # 6-9 Page 16 of 26

Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior
		RESPONSE STRATEGIES, Attachment 2 • Direct a new reactor pressure band of 500 to 1050 psig • Expand the water level control band to -20 to +45" band.
	BOP	• Open one TBV for pressure reduction • Stabilize pressure between 450 to 550 psig
	BOP	**Torus Spray Actions** APPLICABLE PROCEDURE NOTES Torus Spray may be initiated before closing MO-1001-16A (B), RHR HX A (B) Bypass Valve. 5000 GPM on FI-1040-11A (B) and/or FI-1040-12A (B) is the maximum RHR loop flow in Torus Spray mode to allow for sufficient spray header pressure and flow. Torus Spray is established with only one loop of RHR. • IF it is necessary to override LPCI initiation signals, THEN PERFORM the following: a) IF only the LPCI initiation signal is present, THEN PLACE the LPCI OVERRIDE switch to "MANUAL OVERRIDE". OR b) IF RPV level interlock (2/3 core coverage) is present, THEN... *(Evaluator Note: Initially it will only be necessary to override the LPCI Initiation signal)* • OPEN MO-1001-34A (B), Torus Cooling/Spray Block Vlv, in the RHR loop selected for operation. • START/VERIFY STARTED one RHR Pump. • IF no pump discharge flow path exists, THEN OPEN MO-1001-18A (B), RHR Pumps Loop A (B) Minimum Flow Valve, for the selected loop. • OPEN MO-1001-37A (B), Torus Spray Valve, in the RHR loop with the operating pump.

Op Test No.: 2017 Scenario # 2 Event # 6-9 Page 17 of 26

Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior
		• SLOWLY OPEN MO-1001-36A (B), Torus Cooling Valve, AND INCREASE flow to 4800 to 5000 GPM on FI-1040-11A (B) and/or FI-1040-12A (B). • CLOSE MO-1001-18A (B), Pump Min Flow Valve. • WHEN time permits, VERIFY/ALIGN the RHR System in the Maximize Torus Cooling Mode (REFER TO Attachment 14).

	BOP	**Maximize Torus Cooling Actions**
		APPLICABLE PROCEDURE CAUTION
		If erratic fluctuations in discharge pressure, flow, and pump motor current occur, then potential blockage of ECCS suction strainers may exist. Consult PNPS 2.2.19.5 Attachment 8 to recognize and mitigate suction strainer blockage. **[NRC Bulletin 93-02]**
		• MAXIMIZE RBCCW cooling in accordance with Attachment 12. (This step may be performed at any time during the performance of this Attachment.)
		APPLICABLE PROCEDURE NOTE
		To facilitate the establishment of Torus Cooling/Sprays, MO-4060A, MO-4060B (MO-4010A, MO-4010B) may initially be partially opened to establish RBCCW cooling flow to the RHR heat exchanger. However, in the final system alignment, the selected valves should be full open.
		• OPEN/VERIFY OPEN MO-4060A AND/OR MO-4060B (MO-4010A AND/OR MO-4010B), RHR RBCCW HX A (B) Inlet Valves.
		• IF it is necessary to override LPCI initiation signals, THEN PERFORM the following:
		  • IF only the LPCI initiation signal is present, THEN PLACE the LPCI OVERRIDE switch to "MANUAL OVERRIDE".
		  OR
		  • IF RPV level interlock (2/3 core coverage) is present, THEN ...
		  (Evaluator Note: Initially it will only be necessary to override the LPCI Initiation signal)

Op Test No.: 2017 Scenario # 2 Event # 6-9 Page 18 of 26

Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior
		• OPEN/VERIFY OPEN MO-1001-34A (B), Torus Cooling/Spray Block Valve. • START/VERIFY STARTED one RHR Pump per loop. • THROTTLE OPEN/VERIFY OPEN MO-1001-36A (B), Torus Cooling Valve, AND, IF required, RAISE flow to 4500 to 4800 GPM on FI-1040-11A (B) and/or FI-1040-12A (B). • CLOSE MO-1001-18A (B), Pump Min Flow Valve. APPLICABLE PROCEDURE NOTES The closure of the RHR HX Bypass Valve (MO-1001-16A/B) may be delayed for any of the following: • For placing the opposite RHR loop in Torus Cooling. • For spraying the Torus. • For spraying the Drywell. • At the discretion of the SM/CRS for expediting execution of the EOPs based on prioritization. If the closure of the RHR HX Bypass Valve is delayed, then be aware that the maximum cooling configuration for the RHR System in the Torus Cooling or Containment Spray mode **APPLICABLE PROCEDURE CAUTION** The closure of the RHR HX Bypass Valve (MO-1001-16A/B) with two RHR Pumps operating in the same RHR loop may cause heat exchanger damage/failure. • CLOSE MO-1001-16A (B), RHR HX A (B) Bypass Valve. [9] THROTTLE MO-1001-36A (B), Torus Cooling Valve, as required to establish loop flow on FI-1040-11A (B) and/or FI-1040-12A (B) at approximately 4800 to 5000 GPM.
	BOP	**Maximize Drywell Cooling Actions** APPLICABLE PROCEDURE NOTES • The following three steps may be performed in any order.

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Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior
		• Direct the NLO to START/VERIFY STARTED all available Drywell cooling fans on Panel C61. • FULLY OPEN all Drywell cooler RBCCW valves by rotating all pots on Panel C7 to the full clockwise position. • MAXIMIZE RBCCW cooling in accordance with Attachment 1 of 5.3.35.1, Attachment 12

	BOP	**Maximize RBCCW Cooling Actions**
		• START/VERIFY STARTED two RBCCW Pumps in RBCCW Loop "A" ("B").
		• PLACE the remaining RBCCW Pump in the affected loop(s) in "PULL-TO-LOCK".
		• START/VERIFY STARTED two SSW Pumps in SSW Loop "A" ("B").
		• FULLY OPEN MO-3800 for Loop "A" AND/OR MO-3806 for Loop "B", RBCCW Heat Exchanger SSW Outlet Valves.
		• LOWER RBCCW loop temperature controller setpoint to less than 50°F AND/OR CLOSE the following:
		  • Loop A; MO-4084, RBCCW Heat Exchanger A Bypass Valve
		  • Loop B; MO-4083, RBCCW Heat Exchanger B Bypass Valve
		• FULLY OPEN/VERIFY OPEN the following valves to provide cooling water to the appropriate RHR heat exchanger:
		  • Loop A; MO-4060A OR MO-4060B, RHR RBCCW HX A Inlet Valve
		  • Loop B; MO-4010A OR MO-4010B, RHR RBCCW HX B Inlet Valve

	SRO	• Monitor rising Torus bottom pressure and Drywell Temperature
Critical Task #1	**Given a coolant leak inside the Containment, the crew will spray the Drywell, in accordance with EOP-3.**	
	ANY	• Report when torus bottom pressure exceeds 16 psig.
	SRO	• Verify that Torus Level is < 180 inches

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Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior
		• Verify that drywell temperature and pressure are within the Drywell Spray Initiation Limit • Direct that Recirc pumps be tripped • Direct that Drywell Sprays be initiated
	BOP	*(Evaluator Note: Because both loops of DW sprays are available, the expectation is that both loops will be used per the note below. However only one loop is required to satisfy the critical task)* **Drywell Spray Actions** APPLICABLE PROCEDURE NOTES • Drywell Spray may be initiated before closing MO-1001-16A (B), RHR HX A (B) Bypass Valve. • 5000 GPM on FI-1040-11A (B) and FI-1040-12A (B) is the maximum RHR loop flow in Drywell Spray mode to allow for sufficient spray header pressure and flow. • If available, the Drywell is to be sprayed with both loops of RHR • IF running, THEN TRIP the Reactor Recirc Pump(s) by opening the associated pump drive motor breaker control switch(es) at Panel C904. • IF it is necessary to override LPCI initiation signals, THEN PERFORM the following: • IF only the LPCI initiation signal is present, THEN PLACE the LPCI OVERRIDE switch to "MANUAL OVERRIDE". OR • IF RPV level interlock (2/3 core coverage) is present, THEN... *(Evaluator Note: Initially it will only be necessary to override the LPCI Initiation signal)* • OPEN/VERIFY OPEN MO-1001-34A (B), Torus Cooling/Spray Block Vlv. • START/VERIFY STARTED one RHR Pump in each loop. • IF no pump discharge flow path exists, THEN OPEN MO-1001-18A (B), RHR Pumps Loop A (B) Minimum Flow

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Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior
		Valve. • IF available, FULLY OPEN both Drywell Spray valves in each RHR loop: • MO-1001-23A, RHR Loop A Upper Drywell Spray Valve #1 AND MO-1001-26A, RHR Loop A Upper Drywell Spray Valve #2 • MO-1001-23B, RHR Loop B Upper Drywell Spray Valve #1 AND MO-1001-26B, RHR Loop B Upper Drywell Spray Valve #2 • IF Torus Cooling has NOT been previously established, THEN ESTABLISH a loop flow of 4800 to 5000 GPM on FI-1040-11A (B) and/or FI-1040-12A (B) by slowly opening MO-1001-36A (B), Torus Cooling Valve. • CLOSE MO-1001-18A (B), Pump Min Flow Valve. • WHEN time permits, VERIFY/ALIGN the RHR System in the Maximize Torus Cooling Mode (REFER TO Attachment 14).
		RPV Level Continues to Lower
	ANY	• Recognize / report trip of Condensate pump B (loss of all Feedwater) • Report that Reactor water level is lowering
	SRO	• Direct injection with HPCI and/or RCIC • Acknowledge trip of HPCI • Establish successively lower level bands of control as level continues to fall • Shift level control to the fuel zone level instruments *(Evaluator Note: The PNPS Fuel Zone Instruments are calibrated for accident conditions and read significantly lower than actual level with the RPV at pressure. Conversion charts are used to correlate indicated level to actual level)*

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Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior
		• Direct that "B" CRD be aligned for emergency makeup • Direct that a SBLC pump be started
IOS Instructions: Role Play as NLO and coordinate aligning the "B" CRD pump for Emergency Makeup 2.2.87, Section 8.1		
	RO	• Inject with SBLC **CRD Emergency Makeup Actions** • Direct NLO to perform local valve alignments IAW PNPS 2.2.87, Section 8.1 • Open MO-302-8, Drive Wtr PCV; • FULLY OPEN FCV-302-6A OR FCV-302-6B, FLOW CONTROL VLV A or B, using FIC-340-1, CRD FLOW CONTROL, on Panel C905. THROTTLE as necessary.
	BOP	• Attempt to inject with HPCI: • **MOMENTARILY DEPRESS** the HPCI System Injection Mode push button. • **VERIFY** the MANUAL START SEQUENCE indicating light is ILLUMINATED. • **VERIFY** the following automatic actions occur: • MO-2301-3, TURBINE SUPPLY VLV, has opened. • MO-2301-8, INJ VLV #2, has opened. • MO-2301-14, PUMP MIN FLOW VLV, closed when pump discharge flow is greater than 800 GPM. • P-223, GLAND SEAL CONDENSER BLOWER, is running. • Recognize / report HPCI trips • Inject with RCIC: • **MOMENTARILY DEPRESS** the RCIC System Injection Mode push button. • **VERIFY** the MANUAL START SEQUENCE indicating light is

Op Test No.: 2017 Scenario # 2 Event # 6-9 Page 23 of 26

Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior
		ENERGIZED. • **VERIFY** the following automatic actions occur: • MO-1301-61, TURBINE SUPPLY VLV, has opened. • MO-1301-49, RCIC PUMP DISCHARGE INJECTION VALVE #2, has opened. • MO-1301-60, PUMP MIN FLOW VLV, closes when pump discharge flow is greater than or equal to 100 GPM. • AO-1301-34 and AO-1301-35, STEAM LINE DRN VLVs, close. • AO-1301-12 and AO-1301-13, BAROMETRIC CONDR DRN VLVs, close. • MO-1301-62, COOLING WTR SUPPLY VLV, opens. • P-222, VACUUM PUMP, starts. • P-221, CONDENSATE PUMP, starts and stops by level control. • RCIC flow levels off and stays at 400 GPM, indicating that FIC-1340-1, INJECTION FLOW CONTROL, has control of turbine speed.
	SRO	• As level continues to lower direct that available low pressure ECCS be aligned for injection.
	BOP	• Align available low pressure ECCS for injection
Critical Task # 2	**Given a coolant leak, a loss of high pressure injection systems, and the inability to restore and maintain Reactor water level above the Top of Active Fuel (TAF), the crew will initiate actions for an Emergency RPV Depressurization, in accordance with EOP-1.** *(Evaluator Note: At a pressure band of 450 to 550 psig, TAF will be reached when the Fuel Zone Level Indicators indicate -155 inches. Minimum Steam Cooling Water Level will be reached when indicators read -176 inches.)*	
	Any	• Report when level drops below TAF.
	SRO	• When level cannot be restored and maintained >-150 inches (actual) enter EOP-17, Emergency RPV Depressurization

Op Test No.: 2017 Scenario # 2 Event # 6-9 Page 24 of 26

Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior
	SRO	• Verify torus level is > 50 inches • Direct that all SRVs be opened
	BOP	• Open all SRVs • Report that all SRVs have opened
	RO/BOP	• Recognize / report that CS pump B trips
Critical Task # 3	**Given a coolant leak and a failure of injection systems to maintain Reactor water level, the crew will restore and/or maintain Reactor water level above the Top of Active Fuel, in accordance with EOP-1.**	
	RO/BOP	• Monitor for low pressure injection *(Evaluator Note: Low pressure ECCS injection valves start to open at 400 psig. However the shutoff head of the pumps is ~ 300 psig)* • Diagnose that LPCI Injection Valves MO-29A(B) failed to open when pressure dropped below 400 psig. • Manually open LPCI injection Valve(s).
	SRO	• Direct that level be restored to the normal range • Direct that Containment cooling (Torus spray, drywell spray) be re-established as required. *(Evaluator Note: The containment cooling valves may have closed if level dropped below the 2/3rds core coverage interlock unless the interlock was previously over ridden)*
	BOP/RO	• Restore level to the normal range • Re-establish containment cooling • Place H2O2 analyzers in service as time permits
The scenario may be terminated at the discretion of the Lead Examiner OR when the RPV has been depressurized, RPV level is above TAF, and Containment Parameters are lowering.		

Op Test No.: 2017 Scenario # 2 Event # 6-9 Page 25 of 26

Event Description: Coolant Leak in Drywell; 4160VAC Bus A-2 Fails to Transfer, Delayed Trip of Condensate Pump B; HPCI Trips, ADS Fails to Actuate; Core Spray Pump B Trips, LPCI Injection Valves Fail to Automatically Open

Time	Position	Applicant's Actions or Behavior

E-Plan Classification:

Site Area Emergency based on EAL FS1.1: Loss or potential loss of any two barriers.

SHIFT TURNOVER

- The plant is operating at approximately 80% power.
- Core Spray pump A is out of service for maintenance. This is day 1 of 7 for the TS 3.5.A.2 LCO.
- Instrument Air compressor K-110 is out of service for maintenance.
- Feedwater pump B has a lube oil leak that requires securing the pump.
- Directions to the shift are to:
    - Lower Reactor power to 75% using Recirculation flow (43 Mlbm/hr) and control rods (ROPS). PNPS 2.1.14 section 7.4 is in progress up to step [5].
    - Secure Feedwater pump B per PNPS 2.2.96 section 7.3.4. Operators are standing by in the field for support.

Facility: Pilgrim Scenario No.: NRC-5 Op-Test No.: 2017

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: The plant is operating at approximately 80% power. Instrument Air Compressor K-110 is out of service for maintenance. TBCCW pump A is out of service for maintenance.

Turnover: Start RWCU pump B and secure RWCU pump A per PNPS 2.2.83 attachment 12 section 1.0.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Swap RWCU Pumps 2.2.83
2	NM17	I – BOP, SRO	LPRM Fails Upscale ARP C905L-F8, 2.4.38, Technical Specifications
3	Override	C – All	One MSIV Fails Closed 2.4.30
4	Override	C – BOP, SRO	Inadvertent Core Spray Pump Start with High Vibrations 2.4.35, Technical Specifications
5	Overrides	R – RO, SRO I – BOP	High Feedwater Heater Level ARP C1C-A3, 2.4.150
6	PC23	M – All	Torus Leak EOP-3, EOP-1, 2.1.6, EOP-17
7	Override	I – RO, SRO	Bypass Opening Jack Fails to Open Turbine Bypass Valves EOP-1
8	Overrides	C – BOP, SRO	Condensate Transfer Pump Trip, Standby Pump Fails to Automatically Start EOP-3

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

Facility: **Pilgrim**	Scenario No.: **NRC-5**	Op-Test No.: **2017**
1. Total malfunctions (5-8) **Events 2, 3, 4, 5, 6, 7, 8**	7	
2. Malfunctions after EOP entry (1-2) **Events 7 & 8**	2	
3. Abnormal events (2-4) **Events 3, 4, 5**	3	
4. Major transients (1-2) **Event 6**	1	
5. EOPs entered/requiring substantive actions (1-2) **EOP-1, EOP-3**	2	
6. EOP contingencies requiring substantive actions (0-2) **EOP-17**	1	
7. Critical tasks (2-3)	3	
CRITICAL TASK DESCRIPTIONS: **CT-1: Given an un-isolable Torus water leak and the inability to maintain Torus water level above 95", the crew will initiate a manual Reactor scram, in accordance with EOP-03.** **CT-2: Given an un-isolable Torus water leak and the inability to maintain Torus water level above 95", the crew will stop and prevent HPCI operation, in accordance with EOP-03.** **CT-3: Given an un-isolable Torus water leak and the inability to maintain Torus water level above 90", the crew will perform an Emergency RPV Depressurization, in accordance with EOP-03.**		

Scenario Summary:

The crew will assume the shift with the plant at approximately 80% power. Instrument Air Compressor K-110 is out of service for maintenance. TBCCW pump A is out of service for maintenance. The crew will begin by starting RWCU pump B and secure RWCU pump A per PNPS 2.2.83 attachment 12 section 1.0.

LPRM 20-29B will fail upscale. This will cause APRM B to indicate high and result in a half scram. The crew will bypass APRM B and reset the half scram. The crew will then bypass the LPRM and restore APRM B to service. The SRO will determine the Technical Specification impact.

Core Spray pump B will inadvertently start. The crew will execute PNPS 2.4.35, Inadvertent Initiation of Core Standby Cooling Systems (CSCS). If dispatched while the pump is still running, an NLO will report that the pump has elevated vibrations and is very hot to the touch. The crew will secure Core Spray pump B. The SRO will declare the pump inoperable and determine the Technical Specification impact.

MSIV 1B will drift closed. The plant will remain operating with only three Main Steam lines in service. The crew will execute 2.4.30, MSIV Closure. The crew will lower Reactor power to ≤75% and align the plant for operation with a Main Steam line isolated.

A Feedwater Heater level control issue will result in high level in the B 1st point Feedwater Heater. The crew will execute PNPS 2.4.150, Loss of Feedwater Heating, and lower Reactor power further. The crew will be informed that the level control issue has been fixed. The crew will restore the Feedwater Heater to service.

A leak will develop from the Torus. The crew will attempt to add water to the Torus, but this will fail due to malfunctions of the Condensate Transfer pumps. The crew will execute EOP-03, Primary Containment Control. The crew will manually scram the Reactor and prevent HPCI operation. The crew will likely attempt aggressive cooldown with Turbine Bypass Valves, but a failure of the Bypass Opening Jack Motor (BOJM) control switch will limit this effort. The crew will perform an Emergency RPV Depressurization when Torus water level cannot be maintained above 90".

E-Plan Classification:

Site Area Emergency based on EAL FS1.1: Loss of potential loss of any two barriers.

Setup:

- Initialize the simulator to IC-75.
- Open and execute LP "NRC Scenario 5".
- Verify TBCCW pump A is out of service with a caution tag hanging on the control switch.
- Verify RWCU pump A is running and B is secured.
- Prepare procedures:
  - PNPS 2.2.83 attachment 12 section 1.0 ready to perform

Op Test No.: 2017 Scenario # 5 Event # 1 Page 4 of 15

Event Description: Swap RWCU Pumps

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. The previously executed LP steps labeled "Setup" and "Events 7-8 Presets" performed the following: a. Removed IAC K-110 from service. b. Removed TBCCW pump A from service. c. Failed the BOJM. d. Failed Condensate Transfer pumps.		
Evaluator Note:	*The critical elements of each critical task are highlighted in grey.*	
	SRO	• Direct the BOP to start RWCU B and secure RWCU pump A per PNPS 2.2.83 attachment 12 section 1.0
	RO	• Monitor plant parameters
	BOP	• Start RWCU B and secure RWCU pump A per PNPS 2.2.83 attachment 12 section 1.0: • START/VERIFY STARTED P-204B, RWCU Pump B • STOP/VERIFY STOPPED P-204A, RWCU Pump A • Dispatch NLO to: o CLOSE 1201-132A, RWCU Pump P-204A Suction Valve #1, using remote operator S-12-3 if available o CLOSE 1201-55A, RWCU Pump P-204A Suction Valve #2, using operator S-12-4 if available o CLOSE 1201-61A, RWCU Pump A Discharge Valve o DEPRESSURIZE the pump casing and associated piping by slowly opening and leaving open the following valves: o 1201-56A, RWCU Pump P-204A Casing Vent Valve to CRW o 1201-57A, RWCU Pump P-204A Casing Vent Valve to CRW
IOS Operator: When directed by Lead Examiner, proceed to next event.		

Op Test No.: 2017 Scenario # 5 Event # 2 Page 5 of 15

Event Description: LPRM Fails Upscale

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 2". This inserts malfunction NM17 to fail LPRM 20-29B upscale.		
	RO	• Recognize / report annunciator C905L-F8, LPRM HI • Recognize / report LPRM 3B-20-29 is upscale high by observing the full core display
	SRO	• Direct execution of PNPS 2.4.38, LPRM Failure • Determine APRM B is inoperable • Refer to Tech Spec Table 3.1.1 and determine that the minimum number of operable APRMs is still satisfied and generate a Tracking LCO
	RO	• IF the failed LPRM has caused an APRM "HI-HI/INOP", THEN BYPASS the APRM AND RESET 1/2-Scram • VERIFY failed LPRM by demanding "Instrument Readings/Status Raw LPRM Readings Log" 3D Monicore (F10 key) • Coordinate with BOP to bypass LPRM • WHEN the failed LPRM is bypassed, THEN RETURN any affected APRM to the NORMAL condition • IF the failed LPRM is feeding an APRM, THEN PROCEED as follows: o VERIFY that affected APRM channel has an adequate number of inputs (greater than 10) o REFER TO PNPS 2.1.15 Attachment 2 - Daily Log Test #36 *Examiner Note: PNPS 2.1.15 specifies that if any APRM channel has < 2 LPRM inputs on any level, the APRM is considered inoperable. This administrative requirement is also specified in TS Table 3.1.1 Note 13.* • Report that APRM "B" has only one level B LPRM
	BOP	• BYPASS failed LPRM on Panel C937 in accordance with PNPS 2.2.66: o BYPASS the LPRM by placing the control or thumb switch (S-1) to the "BY" position o IF LPRM failure has caused an APRM "HI", "HI-HI", or "LOW" condition, PRESS "TRIP RESET" on the APRM
IOS Operator: When directed by Lead Examiner, proceed to next event.		

Op Test No.: 2017 Scenario # 5 Event # 3 Page 6 of 15

Event Description: Inadvertent Core Spray Pump Start with High Vibrations

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 3". This inserts an override to start Core Spray pump B. 2. If dispatched to check Core Spray pump B while it is still running, wait 2 minutes and report that the pump has abnormally high vibrations and feels very hot to the touch.		
	BOP	• Recognize / report annunciators: o C903L-F1, RHR/CW PUMP RUNNING o C903R-D6, CS PUMP B START • Recognize / report inadvertent start of Core Spray pump B
	SRO	• Direct entry into PNPS 2.4.35, Inadvertent Initiation of Core Standby Cooling Systems (CSCS) • Declare Core Spray pump B inoperable • Determine Tech Spec 3.5.A.2.a requires entry into a 7 day LCO
	BOP	• Execute PNPS 2.4.35, Inadvertent Initiation of Core Standby Cooling Systems (CSCS): • Confirm inadvertent initiation by verification of proper Reactor water level or Drywell pressure on two independent instruments • Secure Core Spray pump B by placing the control switch in the "Pull To Lock" position • Assess operating conditions on power to flow map • Check Process Radiation Monitors • Determine no Reactor power or pressure excursion occurred
IOS Operator: When directed by Lead Examiner, proceed to next event.		

Op Test No.: 2017 Scenario # 5 Event # 4 Page 7 of 15

Event Description: One MSIV Fails Closed

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 4". This inserts an override to close MSIV 1B.		
	ANY	• Recognize / report annunciator C905R-D2, MSIV NOT FULL OPEN • Recognize / report MSIV 1B is closing / closed
	SRO	• Direct entry into PNPS 2.4.30, MSIV Closure • Direct power reduction to ≤75%
	BOP	• Execute PNPS 2.4.30, MSIV Closure: • Informs SRO that Reactor power reduction to ≤75% power is required in accordance with PNPS 2.1.14, *"Station Power Changes"* Sections 7.9, 7.10, and 7.11 as required • CHECK Process Radiation Monitors on Panels C910 and C902 for indications of fuel failure caused by power/pressure spiking • CHECK power and pressure indications for peak values during the transient • NOTIFY Chemistry to initiate Reactor water sampling in accordance with PNPS 7.8.1, *"Chemistry Sample and Analysis Program"*, for any Reactor power change of greater than 15% in less than 1 hour • DETERMINE which MSIV(s) has closed: o PLACE the control switch(es) to "CLOSE" for those MSIV(s) which indicate closed o DETERMINE cause of the MSIV closure • IF operation of the Main Turbine for longer than 15 minutes with one or more closed MSIVs is expected, THEN REFER TO PNPS 2.2.92, *"Main Steam Line Isolation and Turbine Bypass Valves,"* Section 7.2 o CLOSE/VERIFY CLOSED the following Main Steam Line Drain Valves: ▪ MO-220-1, MSIV DRNS INBD ISOL VLV ▪ MO-220-2, MSIV DRNS OUTBD ISOL VLV ▪ MO-220-4, MAIN STEAM LINE DRN TO CONDR o OPEN/VERIFY OPEN MO-220-3, MAIN STEAM LINE DRN VLV. o VERY SLOWLY POSITION the MO-220-4 (MAIN STEAM LINE DRN TO CONDR) valve to establish and maintain a Main Steam Line low point drain temperature (TE-3604) as close to BUT NOT GREATER THAN 520°F

Op Test No.: 2017 Scenario # 5 Event # 4 Page 8 of 15

Event Description: One MSIV Fails Closed

Time	Position	Applicant's Actions or Behavior
		○ CONTINUE TO OPERATE with MO-220-3 (MAIN STEAM LINE DRN VLV) OPEN AND MO-220-4 (MAIN STEAM LINE DRN TO CONDR) THROTTLED until the closed MSIV can be returned to service
	RO	• To lower Reactor power with Recirc, PERFORM the following on the selected Recirc Speed Controller SIC-262-025A OR SIC-262-025B: ○ ENSURE the selected Recirc Speed Controller is in MANUAL by observing that an "M" is illuminated to the right of the bar graphs. ○ ENSURE the RIGHT BAR (Speed Demand) is selected by observing that the dot above the RIGHT BAR is illuminated. ○ MOMENTARILY DEPRESS the down (▼) push button on the left side of the control pad. ○ OBSERVE the RIGHT BAR (Speed Demand) indication lowers. ○ CONTINUE TO REPERFORM Steps [3](a) through [3](e) until the desired Reactor power or core flow is obtained. ○ Maintain pump speed mismatch within the Admin Limits of within 8% of each other when power level is > 80% and within 13% of each other when power level is ≤ 80% ○ WHEN at a core flow of approximately 43 Mlb/hr, STOP REDUCING core flow AND BEGIN INSERTING control rods • Insert the RPR as follows: *Evaluator Note: the following steps are contained in PNPS 9.13, Attachment 8* ○ INSERT control rods listed in Step 1 of RPR Array Sheet in any order using Emergency In continuous rod insertion for each rod ○ The C905 Reactor Operator shall verify that control rods in Step 1 of the RPR Array Sheet are inserted to the required position AND initial in the indicated location ○ DETERMINE whether a further Reactor power reduction is required. ○ REPEAT Steps above for subsequent steps in RPR array until the desired power reduction has been obtained or until directed otherwise by the Shift Manager *Evaluator Note: It is anticipated that only the 1st step of the RPR will be required*
IOS Operator: When directed by Lead Examiner, proceed to next event.		

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Event Description: High Feedwater Heater Level

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 5". This inserts overrides to cause high level in Feedwater B 1st point heater. 2. Once the power reduction and initial crew response is complete, execute LP step labeled "Allow restoration of FWH". Call the Control Room as Ops Management. Report that an I&C technician accidentally bumped into a Feedwater Heater Rack. Report that everything is now normal at the rack and the crew may restore the Feedwater Heater to service.		
	ANY	• Recognize / report annunciator C1C-A3, 1st POINT HTR LEVEL HI • Diagnose controller failure • May attempt manual control of Feedwater heater level
	SRO	• Direct entry into PNPS 2.4.150, Loss of Feedwater Heating • Direct Reactor power reduction using the RPR array to 25% below pre transient value • After call from I&C, direct restoration of Feedwater Heating
	BOP	• Execute 2.4.150, Loss of Feedwater Heating: • Coordinate with crew to lower Reactor power • VERIFY thermal limits are acceptable • ASSESS operating conditions by plotting core thermal power versus core flow on the appropriate Pilgrim Power/Flow Map • CHECK post-transient feedwater heater temperature against the limitations of Attachment 1 • When directed, restore Feedwater Heater per Attachment 3: o IF necessary to recover a 1st point feedwater heater, PERFORM the following: ▪ ENSURE condensate flow is established through the 2nd point feedwater heater by verifying the high pressure feedwater heater 1ST & 2ND PNT INLET BLOCK VALVE ("A" MO-3477/"B" MO-3478) AND the 1ST PNT HTR OUTLET BLOCK VALVE ("A" MO-3479/"B" MO-3480) are OPEN ▪ SLOWLY JOG OPEN the Panel C4 1ST PNT HTR EXTRACTION STEAM ISOLATION VALVE ("A" MO-3156/"B" MO-3256) while observing heater level for level perturbations • CHECK PRMs on Panel C910 AND PRM recorders on Panel C902 to ensure fuel integrity

Op Test No.: 2017 Scenario # 5 Event # 5 Page 10 of 15

Event Description: High Feedwater Heater Level

Time	Position	Applicant's Actions or Behavior
		• NOTIFY Reactor Engineering of the loss of feedwater heating • INFORM Engineering of the event including heater configuration, feedwater temperature, and present expected power level
IOS Operator: When directed by Lead Examiner, proceed to next event.		

Op Test No.: 2017 Scenario # 5 Event # 6-8 Page 11 of 15

Event Description: Torus Leak; Bypass Opening Jack Fails to Open Turbine Bypass Valves; Condensate Transfer Pump Trip, Standby Pump Fails to Automatically Start

Time	Position	Applicant's Actions or Behavior
IOS Instructions: 1. Execute LP step labeled "Event 6". This inserts malfunction PC23 to initiation the Torus leak. LP step labeled "Event 7" will also insert an override to trip the Condensate Transfer Jockey pump. 2. if directed, coordinate with the Control and initiate Torus Makeup IAW PNPS 2.2.35, Section 7.3.		
	ANY	• Recognize / report annunciator C904LC-C2, TORUS LEVEL LO • Recognize / report lowering Torus water level
Critical Task #1	Given an un-isolable Torus water leak and the inability to maintain Torus water level above 95", the crew will initiate a manual Reactor scram, in accordance with EOP-03.	
Critical Task #2	Given an un-isolable Torus water leak and the inability to maintain Torus water level above 95", the crew will stop and prevent HPCI operation, in accordance with EOP-03.	
Critical Task #3	Given an un-isolable Torus water leak and the inability to maintain Torus water level above 90", the crew will perform an Emergency RPV Depressurization, in accordance with EOP-03.	
	SRO	• When Torus water level drops below 127" WR (-6" NR), enter EOP-03, Primary Containment Control • Direct Torus makeup be initiated IAW PNPS 2.2.35 • Before Torus water level drops to 95", enter EOP-01 • Direct a manual Reactor scram and entry into PNPS 2.1.6, Reactor Scram • Direct Reactor water level controlled +12 to +45" using Feedwater • Direct Reactor pressure be controlled 900 to 1050 psig using TBVs • May direct aggressive cooldown with TBVs • Acknowledge failure of BOJM to open TBVs • Direct that isolations and initiations be verified

Op Test No.: 2017 Scenario # 5 Event # 6-8 Page 12 of 15

Event Description: Torus Leak; Bypass Opening Jack Fails to Open Turbine Bypass Valves; Condensate Transfer Pump Trip, Standby Pump Fails to Automatically Start

Time	Position	Applicant's Actions or Behavior
		• When Torus water level cannot be maintained above 95", direct stop and prevent HPCI operation • When Torus water level cannot be maintained above 90", direct Emergency RPV Depressurization: o Enter EOP-17 o If Torus water level is above 50", then direct open all SRVs *Examiner Note: It is expected that the crew will perform Emergency RPV Depressurization while Torus water level is above 50", however the alternate EOP-17 step is provided here for completeness.* o If Torus water level is below 50", then direct rapidly depressurizing the RPV using one or more RPV Depressurization System, Table T
	BOP	• Attempt to initiate Torus makeup per PNPS 2.2.35 section 7.3: • MONITOR Torus level at LR-5038 (Panel C903) • Direct NLO to VERIFY OPEN/OPEN 10-HO-65 (Torus Makeup Block Valve from Condensate Transfer System) in RHR Quad B mezzanine • Direct NLO to OPEN 26-HO-16 (Torus Makeup Supply Valve) located in the Condensate Transfer Bay, 3 ft level in the Aux Building • Attempt to START/VERIFY STARTED Condensate Transfer Pump (P-109A or B) either locally or from the Control Room (C10) • Recognize / report failure of Condensate Transfer pumps A and B and inability to makeup to the Torus
	RO	• At Panel C905, DEPRESS both manual Reactor Scram push buttons. • PLACE Reactor Mode switch in "SHUTDOWN". • VERIFY AND ANNOUNCE the status of APRM downscales. • VERIFY all control rods are fully inserted. • (Evaluator Note: The simulator randomly selects a few control rods to go "beyond full-in" resulting in a loss of position indication. The Plant Process computer may take up to 3 minutes before an "ALL

Op Test No.: 2017 Scenario # 5 Event # 6-8 Page 13 of 15

Event Description: Torus Leak; Bypass Opening Jack Fails to Open Turbine Bypass Valves; Condensate Transfer Pump Trip, Standby Pump Fails to Automatically Start

Time	Position	Applicant's Actions or Behavior
		RODS In" indication is received.) • IF any control rod position cannot be determined AND the Reactor is shutdown, THEN SELECT each control rod not at position "00" AND ATTEMPT TO NOTCH INSERT the control rod to determine whether the control rod will settle at position "00". • In order to maintain availability of the Main Condenser, HPCI, and RCIC, PERFORM the following: o CLOSE the Feedwater Regulating Valves and the Feedwater HP Block Valves (Panel C905): o FC-642A, FLOW CONTROL VLV A o FC-642B, FLOW CONTROL VLV B o MO-3479, 1ST PT HTR OUTLET BLOCK VALVE o MO-3480, 1ST PT HTR OUTLET BLOCK VALVE
	RO/BOP	• Verify initiations and isolations • Control Reactor water level +12 to +45" using Feedwater • Control Reactor pressure 900-1050 psig using TBVs • As directed, initiate cooldown using TBVs o Recognize / report BOJM fails to open TBVs • Stop and prevent HPCI operation: o IF HPCI IS NOT running, THEN PLACE the Aux Oil Pump (P-229) in the PULL-TO-LOCK position o IF HPCI IS running, THEN PERFORM the following: ▪ DEPRESS AND HOLD the HPCI Turbine Trip push button ▪ WHEN Turbine RPM indicates zero RPM, THEN PLACE the Aux Oil Pump in the PULL-TO-LOCK position ▪ WHEN the HPCI Turbine Stop and Control Valves indicate closed, THEN RELEASE the Turbine Trip push button • If directed, open all SRVs *Examiner Note: It is expected that the crew will perform Emergency RPV Depressurization while Torus water level is above 50", however the alternate EOP-17 step is provided here for completeness.* • If directed, rapidly depressurizing the RPV using one or more RPV Depressurization System, Table T
The scenario may be terminated at the discretion of the Lead Examiner OR when all rods		

Op Test No.: 2017 Scenario # 5 Event # 6-8 Page 14 of 15

Event Description: Torus Leak; Bypass Opening Jack Fails to Open Turbine Bypass Valves; Condensate Transfer Pump Trip, Standby Pump Fails to Automatically Start

Time	Position	Applicant's Actions or Behavior

are in, Emergency Depressurization is in progress, and Reactor water level is being controlled in band.

E-Plan Classification:

Site Area Emergency based on EAL FS1.1: Loss of potential loss of any two barriers.

SHIFT TURNOVER

- The plant is operating at approximately 85% power during power ascension.
- Instrument Air Compressor K-110 is out of service for maintenance.
- TBCCW pump A is out of service for maintenance.
- Directions to the shift are to:
    - Start RWCU pump B and secure RWCU pump A per PNPS 2.2.83 attachment 12 section 1.0.