

Facility: <u>ANO-1</u>		Date of Examination: <u>3-8-2010</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>2010-1</u>

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A1. 2.1.25 (Imp 3.9)	N/R	A1JPM-NRC-ADMINCURV Ability to interpret rod insertion limits per COLR for operability
Conduct of Operations A2. 2.1.29 (Imp 4.1)	N/R	A1JPM-NRC-ADMINDWG1 Identify isolation boundaries for "A" Makeup Pump P-36A (including breaker)
Equipment Control A3. 2.2.12 (Imp 3.7)	N/R	A1JPM-NRC-ADMINSURV5 Identify errors in a completed surveillance for the "A" RB Spray Pump P35-A
Radiation Control A4. 2.3.7 (Imp 3.6)	N/R	A1JPM-NRC-ADMINRWP1 Determine stay time in T-36 valve gallery using RWP information
Emergency Procedures/Plan A5.	N/A	N/A

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:

(C)ontrol room, (S)imulator, or Class(R)oom
 (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
 (N)ew or (M)odified from bank (≥ 1)
 (P)revious 2 exams (≤ 1 ; randomly selected)

Facility: <u>ANO-1</u>		Date of Examination: <u>3-8-2010</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Operating Test Number: <u>2010-1</u>

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A1. 2.1.23 (Imp 4.3)	N/R	A1JPM-NRC-ADMINSFPMU1 Review spent fuel pool makeup calculation
Conduct of Operations A2. 2.1.34 (Imp 3.5)	D/P/R	A1JPM-NRC-ADMINCHEM1 Review secondary chemistry package for out of specification feedwater chlorides and respond
Equipment Control A3. 2.2.12 (Imp 3.7)	N/R	A1JPM-NRC-ADMINSURV6 Identify errors in a completed surveillance for the "A" RB Spray Pump P35-A; determine operability
Radiation Control A4. 2.3.7 (Imp 3.6)	N/R	A1JPM-NRC-ADMINRWP1 Determine stay time in T-36 valve gallery using RWP information
Emergency Procedures/Plan A5. 2.4.41 (Imp 4.6)	N/S	A1JPM-NRC-ADMINEAL14 Determine Emergency Action level

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:

(C)ontrol room, (S)imulator, or Class(R)oom
 (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
 (N)ew or (M)odified from bank (≥ 1)
 (P)revious 2 exams (≤ 1 ; randomly selected)

RO ADMIN JPM

A1. CONDUCT OF OPERATIONS

A1JPM-NRC-ADMINCURV

ADMINISTRATIVE JOB PERFORMANCE MEASUREUNIT: 1 REV # 1 DATE: _____TUOI NUMBER: A1JPM-NRC-ADMINCURVSYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – CONDUCT OF OPERATIONSTASK: Ability to Interpret Rod Insertion Limits per COLR for operabilityJTA#: ANO1-RO-CRD-OFFNORM-17KA VALUE RO: 3.9 SRO: 4.2 KA REFERENCE: 2.1.25APPROVED FOR ADMINISTRATION TO: RO: X SRO: _____

TASK LOCATION: INSIDE CR: _____ OUTSIDE CR: _____ BOTH: _____

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: _____ CLASSROOM: XPOSITION EVALUATED: RO: X SRO: _____ACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: _____ CR: XTESTING METHOD: SIMULATE: _____ PERFORM: XAPPROXIMATE COMPLETION TIME IN MINUTES: 5 MINUTESREFERENCE(S): 1105.010EXAMINEE'S NAME: _____ SSN - -

EVALUATOR'S NAME: _____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS
CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____ UNSATISFACTORY: _____

PERFORMANCE CHECKLIST COMMENTS:

_____ Start Time _____ Stop Time _____ Total Time

SIGNED _____ DATE: _____

SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY A
QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

ADMINISTRATIVE JOB PERFORMANCE MEASURE**THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:**

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS: The plant is at 92% power and being reduced at 5%/min due to D RCP vibrations high. "D" RCP trips plant power is at 74%. Alarm K08-D4 is received POWER Distribution Alarm. Alarm is in due to exceeding rod insertion limits. Core at 175 EFPD, rod index 248%, Rx power 74%

TASK STANDARD: The examinee has determined rod insertion limits are violated and should enter LCO 3.2.1 and perform SR 3.2.5.1 once per 2 hours and restore rods within acceptable limits within 24 hours

TASK PERFORMANCE AIDS: Cycle 22 COLR, 1203.012G, Tech Specs. 3.2.1

ADMINISTRATIVE JOB PERFORMANCE MEASURE**INITIATING CUE:**

The CRS directs you to perform actions per 1203.012G Annunciator Corrective Action K08-D4 Power Distribution Alarm. Provide the CRS with which region the rods are on the appropriate graph.

CRITICAL ELEMENTS (C): 5

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Reference guidance in Annunciator Corrective Actions (ACA) for K08-D4 alarm.	Use OP 1203.012G for guidance on dealing with the rod insertion limit.	_____	_____	_____
	2. Reference Technical Specification for Regulating Rod Insertion Limits T.S. 3.2.1.	Uses the information in T.S. 3.2.1 to transition to the Core Operating Limits Report (COLR)	_____	_____	_____
	3. Reference COLR for given plant conditions.	Candidate determines based on given plant conditions that Figure 4-A is applicable	_____	_____	_____
	4. Obtain Rod Index and compare to COLR figure 4-A.	Use COLR Figure 4-A and a rod index of 248% to verify what region rods are in	_____	_____	_____
(C)	5. Determine alarm is valid.	Using COLR Figure 4-A determines alarm is valid rod insertion limits are exceeded and the rods fall into the operation restricted area of the curve	_____	_____	_____
	6. Notifies SM he needs to refer to Tech spec LCO 3.2.1.	Informs SM to refer to LCO 3.2.1 (Student may determines SR 3.2.5.1 should be performed once per 2 hours. AND restore regulating rod groups to within acceptable region within 24 hours. NOT REQUIRED)	_____	_____	_____

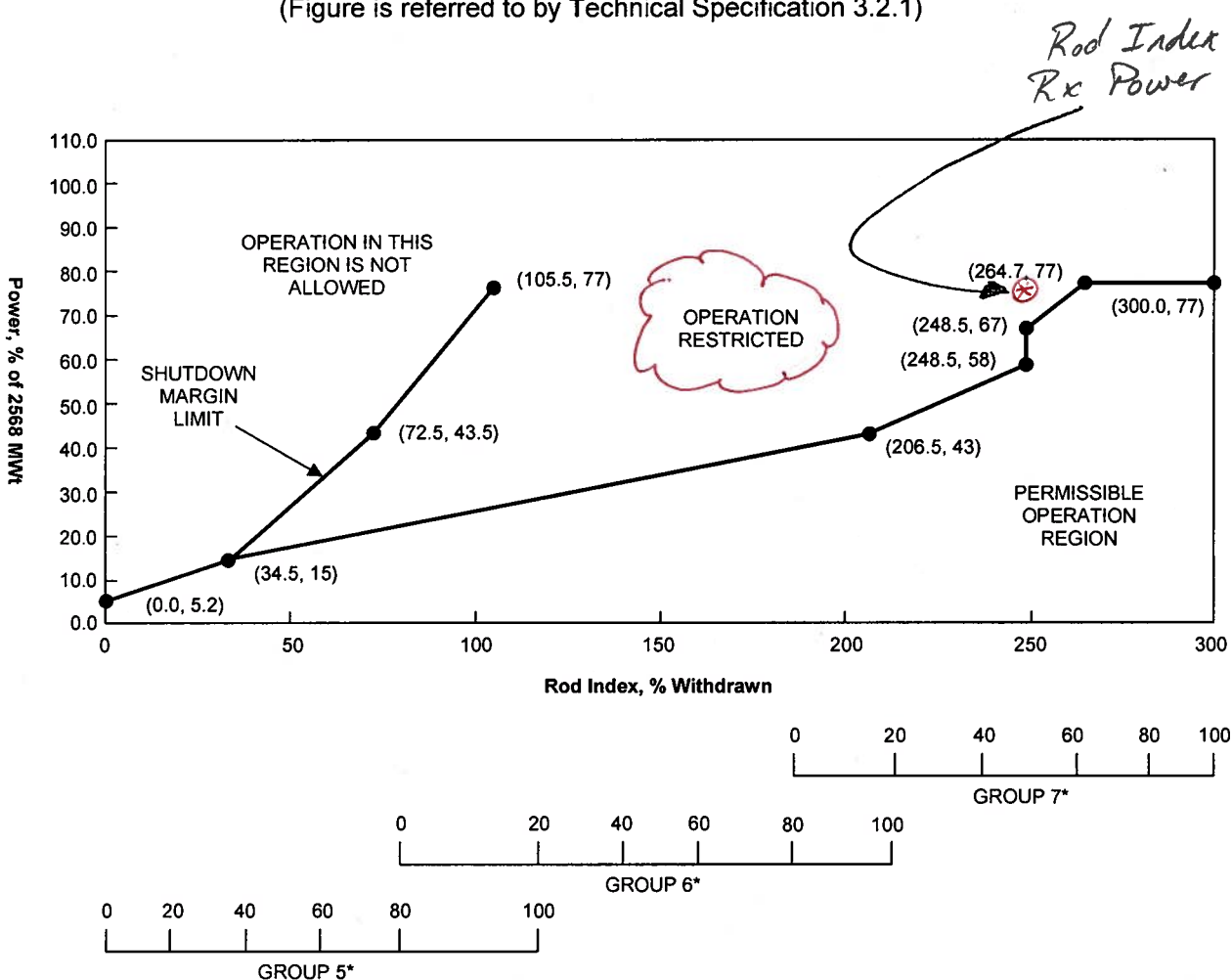
END

KEY

Figure 4-A

Regulating Rod Insertion Limits for Three-Pump Operation From 0 to 200 ± 10 EFPD

(Figure is referred to by Technical Specification 3.2.1)



* Technical Specification 3.5.2.5(2) requires that operating rod group overlap be $20\% \pm 5\%$ between two sequential groups, except for physics tests.

KEY

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

The plant is at 92% power and being reduced at 5%/min due to D RCP vibrations high.

“D” RCP trips plant power is steady at 74%.

Alarm K08-D4 is received POWER Distribution Alarm.

Alarm is in due to exceeding rod insertion limits.

Core at 175 EFPD

Rod index 248%,

Rx power 74%

INITIATING CUE:

**The CRS directs you to perform actions per 1203.012G
Annunciator Corrective Action K08-D4 Power
Distribution Alarm.**

**Provide the CRS with which region the rods are on the
appropriate graph.**

**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

TITLE: ANNUNCIATOR K08 CORRECTIVE ACTION SET #	DOCUMENT NO. 1203.012G	CHANGE NO. 037
	WORK PLAN EXP. DATE N/A	
	SAFETY-RELATED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	IPTE <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
	TEMP MOD <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	LEVEL OF USE <input checked="" type="checkbox"/> CONTINUOUS <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

When you see these TRAPS

Time Pressure
 Distraction/Interruption
 Multiple Tasks
 Over Confidence
 Vague or Interpretive Guidance
 First Shift/Last Shift
 Peer Pressure
 Change/Off Normal
 Physical Environment
 Mental Stress (Home or Work)

Get these TOOLS

Effective Communication
 Questioning Attitude
 Placekeeping
 Self Check
 Peer Check
 Knowledge
 Procedures
 Job Briefing
 Coaching
 Turnover

VERIFIED BY	DATE	TIME

FORM TITLE: <div style="text-align: center; margin-top: 10px;">VERIFICATION COVER SHEET</div>	FORM NO. 1000.006A	CHANGE NO. 054
--	------------------------------	--------------------------

PROC./WORK PLAN NO. 1203.012G	PROCEDURE/WORK PLAN TITLE: ANNUNCIATOR K08 CORRECTIVE ACTION	PAGE: 33 of 61 CHANGE: 037
---	--	---

Page 1 of 3

Location: C13

Device and Setpoint: See page 3 of 3

POWER
DISTRIBUTION
ALARM

Alarm: K08-D4

1.0 OPERATOR ACTIONS

1. Observe Reactor power.
2. IF Reactor power is >100%
OR higher than desired steady state power level,
THEN take action to reduce power to $\leq 100\%$ and to clear alarm.
3. Observe PMS alarm CRT message AND group display (GD K08D4) to determine affected parameter.

NOTE

PMS generates the rod index alarm by comparing 6-minute reactor power (XPP) to the 6-minute control rod index (rodindex). This alarm can occur during normal power reduction when control rods are actually within proper limits.

4. IF annunciator alarm is valid,
THEN refer to TS and perform required actions for any applicable TS Conditions entered.
 - Regulating Rod Insertion Limits 3.2.1
 - Axial Power Shaping Rod Insertion Limits 3.2.2
 - Axial Power Imbalance Operating Limits 3.2.3
 - Quadrant Power Tilt Limits 3.2.4
- A. IF it is determined that Tech Spec SR 3.2.5.1 must be performed,
THEN perform Power Peaking Check (1103.019) which satisfies Tech Spec SR 3.2.5.1.
5. IF Reactor power by heat balance does not match NI power
AND high NI power caused the HIPWR alarm on the Plant Computer,
THEN perform the following:
 - A. Request I&C perform an NI calibration.
 - B. Raise alarm setpoint for the HIPWR alarm just enough to clear the alarm using the Database Maintenance Option on the Plant computer. Document the setpoint change on the Status Board.
 - C. WHEN NI cal is complete,
THEN restore HIPWR alarm setpoint to previous setpoint.

PROC./WORK PLAN NO. 1203.012G	PROCEDURE/WORK PLAN TITLE: ANNUNCIATOR K08 CORRECTIVE ACTION	PAGE: 34 of 61 CHANGE: 037
---	--	---

K08-D4 Page 2 of 3

NOTE

QSEC/QPRIM power alarm input is based on one hour average values and is automatically disabled below 90% power.

6. IF "AENSS035 QSEC/QPRIM PWR RATIO <.995",
OR "AENSS036 QSEC/QPRIM PWR RATIO <.997" is the cause of the alarm,
THEN perform the following:
 - A. Reduce power to $\leq 100\%$ on highest valid indication of power: Nuclear Instruments, Primary Power (PPPRIM), or Secondary Power (PPSEC).
 - B. Notify Reactor Engineering to evaluate per Heat Balance Correction Factor Methodology (1302.027).

NOTE

Plant computer alarms provide a margin to Tech Spec limits. See Device and Setpoint listing.

7. IF alarm caused by approaching rod, imbalance or tilt limits,
THEN take appropriate action to restore the parameter to within limits.
 - A. Establish additional monitoring of the plant computer to ensure Tech Spec limits are not exceeded.
8. Refer to Power Operations (1102.004).

2.0 PROBABLE CAUSES

NOTE

This annunciator has limited reflash capability. If the alarm window is lit solid due to one cause and another particular cause actuates, the alarm will go to fast flash with an audible alarm. See Device and Setpoint for the specific alarms that cause reflash.

- During normal power reduction: rod index alarm from comparison of 6-min reactor power (XPP) to the 6-min control rod index (rodindex).
- Average power of the good NIs exceeds the HIPWR variable setpoint
- Approaching rod index limits
- Approaching group 8 limits
- Approaching imbalance limits
- Approaching quadrant tilt limits
- Restart of Plant computer - NASP program(s) aborted
(AENSS031 NASP Not Running, and ANNSS017 NSS-6 Minute Calcs Aborted)
- RPS channel test in progress
- Secondary heat balance / Primary heat balance ratio <0.997

PROC./WORK PLAN NO. 1203.012G	PROCEDURE/WORK PLAN TITLE: ANNUNCIATOR K08 CORRECTIVE ACTION	PAGE: 35 of 61 CHANGE: 037
---	--	---

K08-D4 Page 3 of 3

3.0 REFERENCES

- Schematic Diagram Annunciator K08 (E-458, sheet 3)
- Software Change Request UT1-96-023
- CR-1-96-0217 Exceeding Rod Index Limits

Device and Setpoint:

<u>Point ID</u>	<u>Description</u>	<u>Additional Information</u>
Y3069	NSS-Power Distribution Alarm	This point drives the annunciator and is driven by the following computer points:
AENSS031	NASP not running	
AENSS035	QSEC/QPRI Power Ratio <0.995	Active above 90% power. AENSS035 = QSECH1 ÷ QPRIH1 (both 1 hour averages)
AENSS036	QSEC/QPRI Power Ratio <0.997	(XPP) >90% power <u>AND</u> Feedwater Correction enabled
AINSS022	NSS-Approach Imbalance Limits	±5% margin to Tech Spec limit
AINSS023	NSS-Approach Rod Index Limits	±10% margin to Tech Spec limit
AINSS024	NSS-Approach Steady State Tilt Limits	±1% margin to Tech Spec limit
AINSS025	NSS-Approach Transient Tilt Limits	±1% margin to Tech Spec limit
HIPWR	HIPWRZ-High Power Alarm Average	
NSSBOOL1	NSS-Power Distribution Alarm	This point is driven by the following computer points:

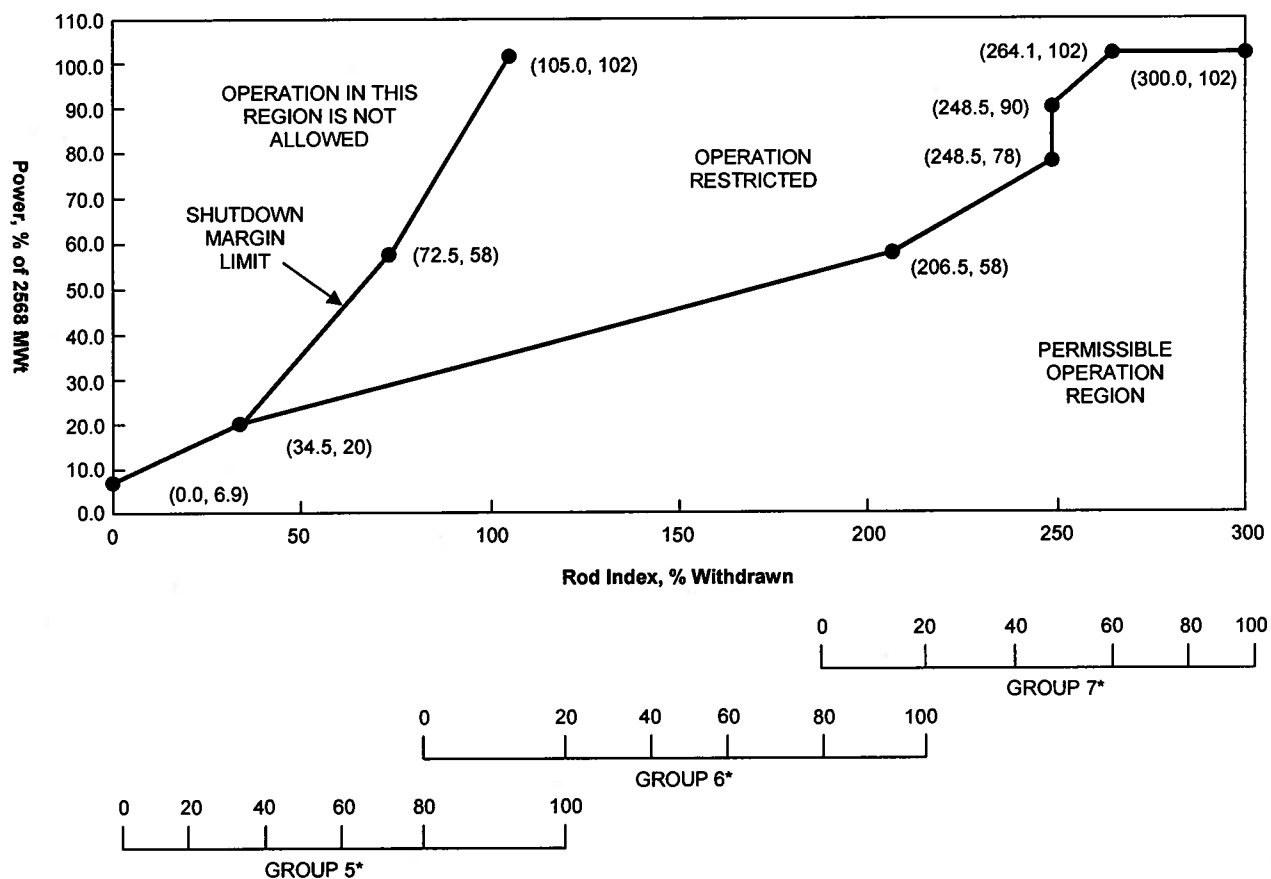
NOTE

The following points do not provide reflash.

ANNSS012	NSS-APSR Limit Exceeded
ANNSS013	NSS-Steady State Tilt Limit Exceeded
ANNSS014	NSS-Transient Tilt Limit Exceeded
ANNSS015	NSS-Imbalance Limit Exceeded
ANNSS016	NSS-Rod Index Limit Exceeded
ANNSS017	NSS-6 Minute Calcs Aborted

Figure 3-A**Regulating Rod Insertion Limits for Four-Pump Operation From 0 to 200 ± 10 EFPD**

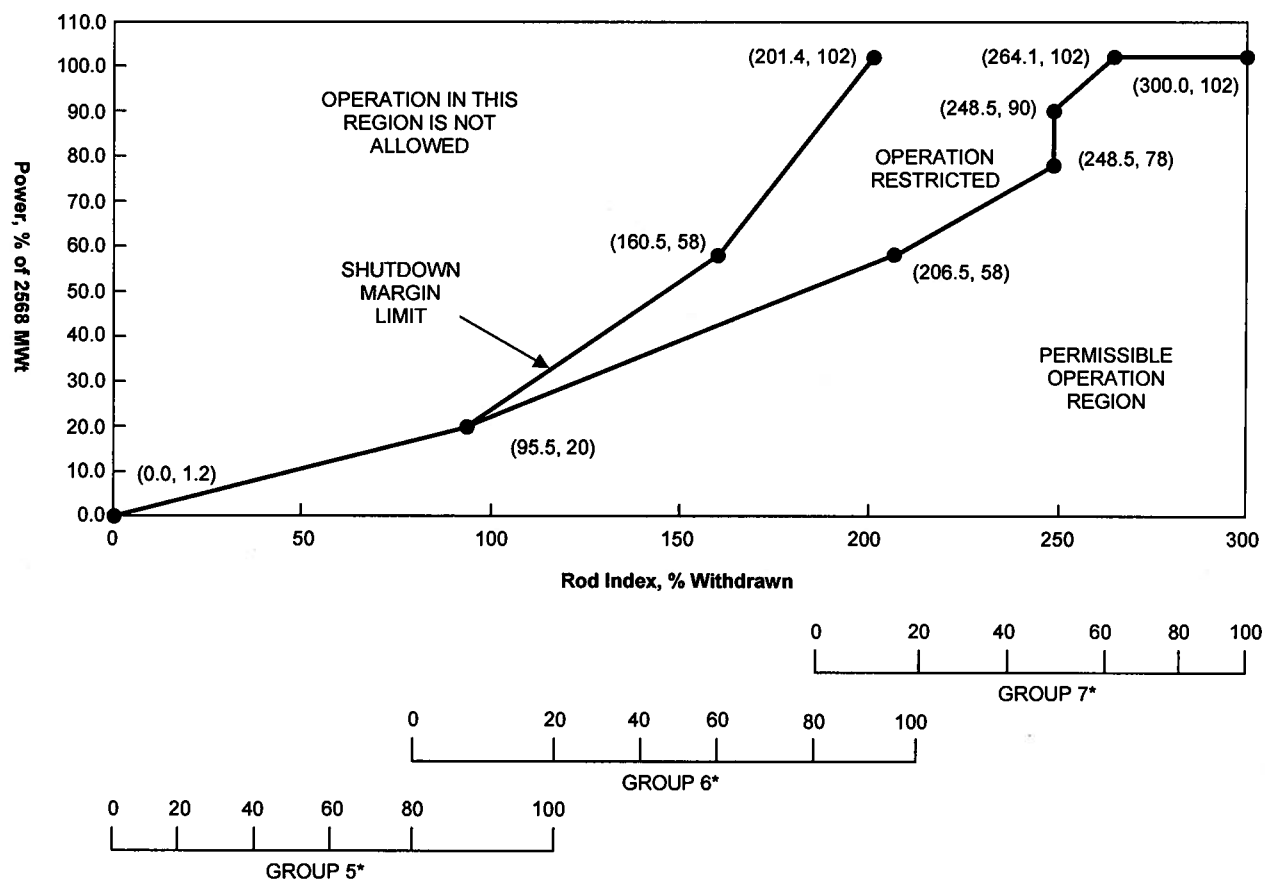
(Figure is referred to by Technical Specification 3.2.1)



* Technical Specification 3.5.2.5(2) requires that operating rod group overlap be $20\% \pm 5\%$ between two sequential groups, except for physics tests.

Figure 3-B**Regulating Rod Insertion Limits for Four-Pump Operation From 200 ± 10 EFPD to EOC**

(Figure is referred to by Technical Specification 3.2.1)

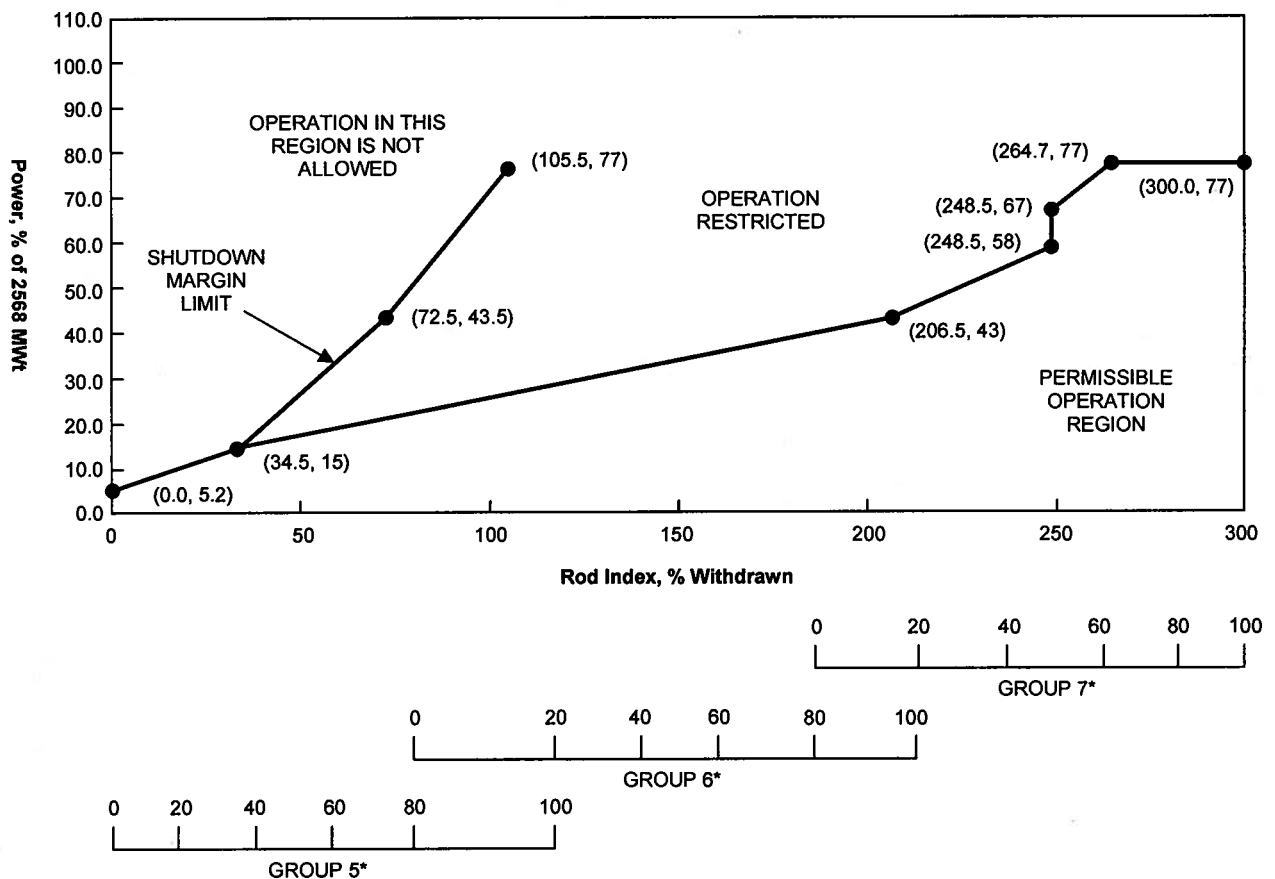


* Technical Specification 3.5.2.5(2) requires that operating rod group overlap be $20\% \pm 5\%$ between two sequential groups, except for physics tests.

Figure 4-A

Regulating Rod Insertion Limits for Three-Pump Operation From 0 to 200 ± 10 EFPD

(Figure is referred to by Technical Specification 3.2.1)

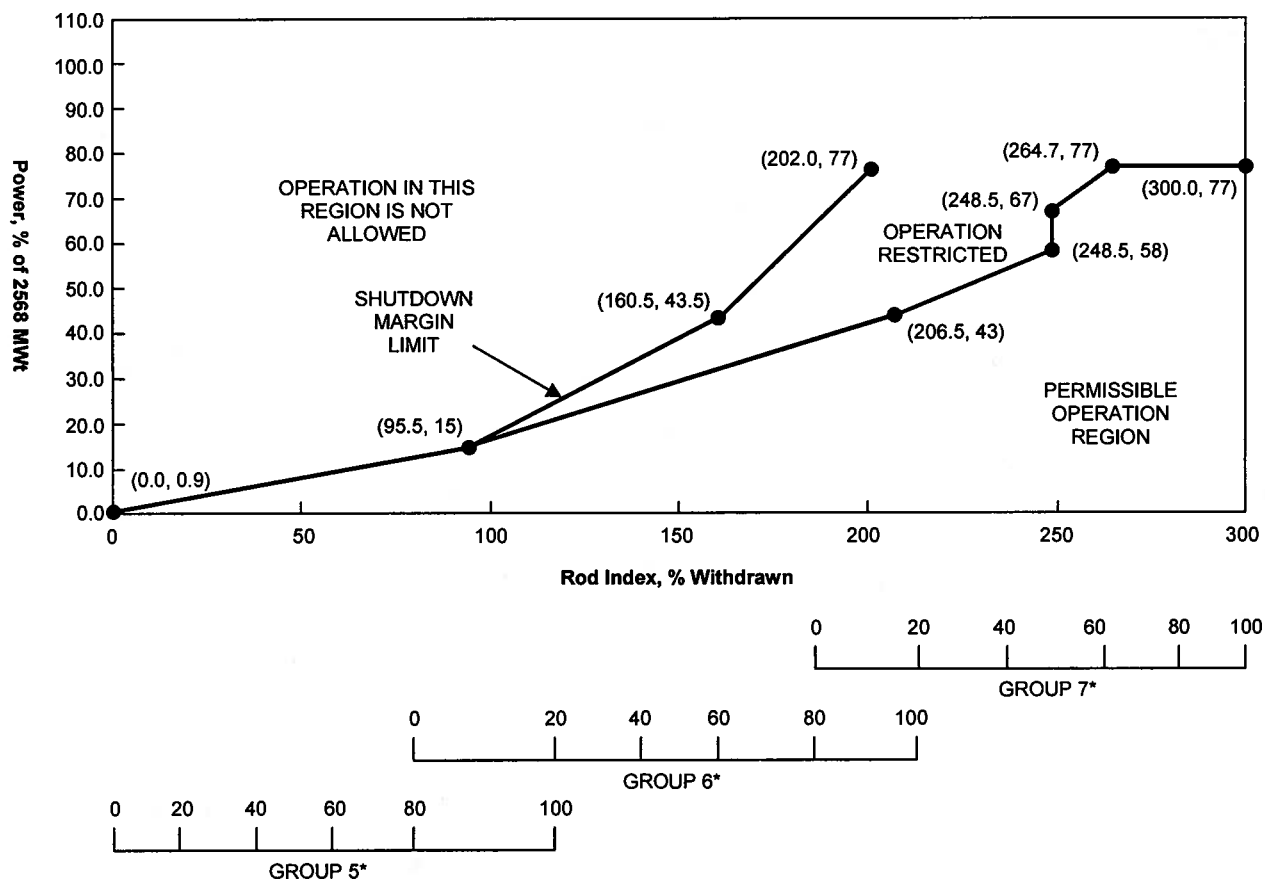


* Technical Specification 3.5.2.5(2) requires that operating rod group overlap be $20\% \pm 5\%$ between two sequential groups, except for physics tests.

Figure 4-B

Regulating Rod Insertion Limits for Three-Pump Operation From 200 ± 10 EFPD to EOC

(Figure is referred to by Technical Specification 3.2.1)



* Technical Specification 3.5.2.5(2) requires that operating rod group overlap be $20\% \pm 5\%$ between two sequential groups, except for physics tests.

3.2 POWER DISTRIBUTION LIMITS

3.2.1 Regulating Rod Insertion Limits

LCO 3.2.1 Regulating rod groups shall be within the physical insertion, sequence, and overlap limits specified in the COLR.

-----NOTE-----
Not required for any regulating rod repositioned to perform SR 3.1.4.2.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Regulating rod groups inserted in restricted operation region.	<p>A.1 -----NOTE----- Only required when THERMAL POWER is > 20% RTP. -----</p> <p>Perform SR 3.2.5.1.</p> <p><u>AND</u></p> <p>A.2 Restore regulating rod groups to within acceptable region.</p>	<p>Once per 2 hours</p> <p>24 hours from discovery of failure to meet the LCO</p>
B. Required Action and associated Completion Time of Condition A not met.	B.1 Reduce THERMAL POWER to less than or equal to THERMAL POWER allowed by regulating rod group insertion limits.	2 hours
C. Regulating rod groups sequence or overlap requirements not met.	C.1 Restore regulating rod groups to within limits.	4 hours

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Regulating rod groups inserted in unacceptable operation region.	D.1 Initiate boration to restore SDM to within the limit provided in the COLR.	15 minutes
	<u>AND</u>	
	D.2.1 Restore regulating rod groups to within restricted operation region.	2 hours
	<u>OR</u>	
	D.2.2 Reduce THERMAL POWER to less than or equal to the THERMAL POWER allowed by the regulating rod group insertion limits.	2 hours
E. Required Actions and associated Completion Times of Conditions C or D not met.	E.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify regulating rod groups are within the sequence and overlap limits as specified in the COLR.	12 hours
SR 3.2.1.2	Verify regulating rod groups meet the insertion limits as specified in the COLR.	12 hours
SR 3.2.1.3	Verify $SDM \geq 1\% \Delta k/k$.	Within 4 hours prior to achieving criticality

RO ADMIN JPM

A2. CONDUCT OF OPERATIONS

A1JPM-NRC-ADMINDWG1

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-NRC- ADMINDWG1

Page 1 of 4

UNIT: 1 REV # 0 DATE: _____

TUOI NUMBER: A1JPM-NRC-ADMINDWG1

SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – CONDUCT OF OPERATIONS

TASK: Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.

JTA#: ENS-OPER-PTAG-ADMIN-1

KA VALUE RO: 4.1 SRO: 4.0 KA REFERENCE: 2.1.29

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: _____ OUTSIDE CR: _____ CLASSROOM: X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: _____ CLASSROOM: PERFORM

POSITION EVALUATED: RO: _____ SRO: _____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: _____ CLASSROOM: PERFORM

TESTING METHOD: SIMULATE: _____ PERFORM: X

APPROXIMATE COMPLETION TIME IN MINUTES: 10 MINUTES

REFERENCE(S): 1107.002, M-231 sh. 1

EXAMINEE'S NAME: _____ SSN _____ - _____ - _____

EVALUATOR'S NAME: _____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS
CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____ UNSATISFACTORY: _____

PERFORMANCE CHECKLIST COMMENTS:

_____ Start Time _____ Stop Time _____ Total Time

SIGNED _____ DATE: _____

SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY A
QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-NRC- ADMINDWG1

Page 2 of 4

EXAMINEE'S COPY

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS: The WCO reports the "A" High Pressure Injection pump (P-36A) has a seal leak..

TASK STANDARD: The examinee has correctly identified the isolation boundary for "A" Makeup Pump (P-36A) using the attached drawing and determined the correct motor power supply breaker

TASK PERFORMANCE AIDS: Attached drawing

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-NRC- ADMINDWG1

Page 3 of 4

INITIATING CUE:

The CRS directs you to markup the attached P&ID to indicate the isolation boundary for the "A" Makeup Pump (P-36A) and determine motor power supply.

CRITICAL ELEMENTS (C) 2

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
NOTE: <i>Inform examinee that this task is to identify the isolation boundary only, a tagout will not be prepared.</i>					
	1. Obtain procedure 1107.002 and drawing M-231 sheet 1	Examinee should determine boundary isolations using controlled procedures and drawings, specifically 1107.002 and M-231 sh. 1.	_____	_____	_____
(C)	2. Determine isolation boundaries.	Examinee determined proper boundary isolations to include: A-306, power supply (Racked Down) MU-18A, Suction valve (Closed) MU-20A, Discharge valve (Closed) MU-21A, Recirc valve (Closed) OR MU-22A, Recirc valve (Closed)	_____	_____	_____
NOTE: <i>The task was to identify isolation boundary to stop the leak. The examinee may also identify the vent and drains for P-36A.</i>					
	3. Determine isolation boundaries	Open ABV-9A pump vent (Open) MU-1018A Disch drain valve (Open) MU-1018B Disch drain valve (Open)	_____	_____	_____

END

A hand-drawn diagram of a Y-junction. The top branch has a red circle in the middle. The bottom branch has a red circle in the middle. The junction is labeled 'Y'.



KEY

PROC./WORK PLAN NO. 1107.002	PROCEDURE/WORK PLAN TITLE: ES ELECTRICAL SYSTEM OPERATION	PAGE: 51 of 80 CHANGE: 025
---------------------------------	--	-------------------------------

ATTACHMENT A

Page 1 of 2

4160V ES SWITCHGEAR CHECKLIST

CAUTION

Do NOT close an open breaker until operator is sure of consequences.

NOTE

- This checklist assumes the unit is in Mode 5 or 6.
- Use of the local breaker status light to determine breaker position will also indicate control power availability.

1.0 Check each listed breaker for the following:

- Breaker in desired position.
- Breaker control power on.
- Breaker racked up.
- Breaker control selector in REMOTE.
- Breaker labeled properly.

1.1 Log any breaker that is danger tagged or NOT in desired position on Lineup Exception Sheet (E-doc 1015.001F).

1.2 Notify plant labeling of any label discrepancies.

4160V ES Bus A3					
BREAKER NUMBER	DESCRIPTION	DESIRED POSITION	ACTUAL POSITION	TAG (✓)	INITIAL
A-301	A3 Feed to B5 (E-104)	Closed			
A-302	Service Water Pump P-4A (E-275)	-			
A-303	Service Water Pump P-4B (E-276)	-			
A-304	RB Spray Pump P-35A (E-241)	Note 1 -			
A-305	LPI Pump P-34A (E-181)	-			
A-306	HPI Pump P-36A (E-211)	Note 1 -			
A-307	HPI Pump P-36B (E-212)	Note 1 -			
A-308	DG1 Output (E-100)	Open			
A-309	A1 Feed to A3 (E-97)	Closed			
A-310	A3-A4 Crosstie (E-98)	Open			
A-311	EFW Pump P-7B (E-294)	Open			

Note 1: This breaker will be racked up by Plant Startup 1102.002.

KEY

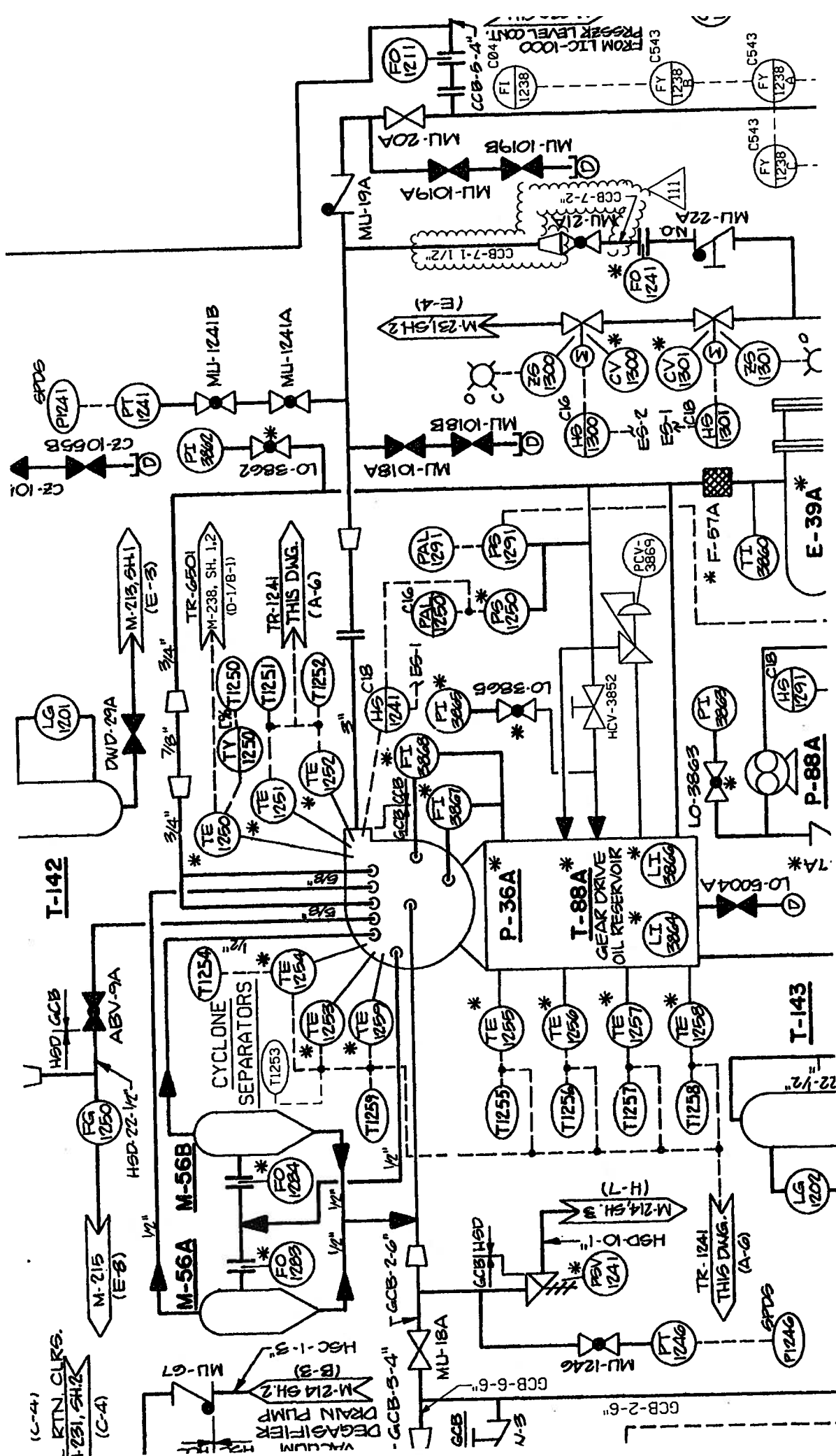
EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- “B” Makeup Pump is in service (OP)
- “C” Makeup Pump is the ES Pump
- The WCO reports the “A” High Pressure Injection pump (P-36A) has a seal leak.

INITIATING CUE:

The CRS directs you to markup the attached P&ID to indicate the isolation boundary for the “A” Makeup Pump (P-36A) and determine motor power supply.



RO ADMIN JPM

A3. EQUIPMENT CONTROL

A1JPM-NRC-ADMINSURV5

ADMINISTRATIVE JOB PERFORMANCE MEASUREUNIT: 1 REV # 1 DATE: _____TUOI NUMBER: A1JPM-NRC-ADMINSURV5SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – EQUIPMENT CONTROLTASK: Identify Errors in a completed surveillanceJTA#: ANO1-RO-SPRAY-SURV-15KA VALUE RO: 3.7 SRO: 4.1 KA REFERENCE: 2.2.12APPROVED FOR ADMINISTRATION TO: RO: X SRO: _____TASK LOCATION: INSIDE CR: _____ OUTSIDE CR: _____ BOTH: X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: _____ CLASSROOM: XPOSITION EVALUATED: RO: X SRO: _____ACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: _____ CR: XTESTING METHOD: SIMULATE: _____ PERFORM: XAPPROXIMATE COMPLETION TIME IN MINUTES: 15 MINUTESREFERENCE(S): OP-1104.005

EXAMINEE'S NAME: _____ SSN _____ - _____ - _____

EVALUATOR'S NAME: _____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS
CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____ UNSATISFACTORY: _____

PERFORMANCE CHECKLIST COMMENTS:

_____ Start Time _____ Stop Time _____ Total Time

SIGNED _____ DATE: _____

SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY A
QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

ADMINISTRATIVE JOB PERFORMANCE MEASURE**THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:**

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS: The plant is at 100% power and the quarterly surveillance for P-35A has been completed per OP-1104.005 Supplement 3.

TASK STANDARD: The examinee has identified 4 of the 6 errors and has declared the Spray Pump Inoperable due to not meeting operability requirements of the surveillance

TASK PERFORMANCE AIDS: Completed portion of OP-1104.005 Supplement 3.

ADMINISTRATIVE JOB PERFORMANCE MEASURE**INITIATING CUE:**

The CRS directs you to perform a peer check of 1104.005 Supplement 3 on "A" Reactor Building Spray Pump surveillance.

CRITICAL ELEMENTS (C): 3

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Discover review of the surveillance procedure results.	Reviews the surveillance procedure provided.	_____	_____	_____
	2. Discover errors and omissions Stop Watch is out of calibration date. Omitted check mark for VUC-1B unit running.	1) Identified that Stop Watch is out of calibration date. 2) Check mark for VUC-1B unit running.	_____	_____	_____
(C)	3. Discover errors and omissions Pump D/P @ 1175 gpm is out of LIMITING RANGE FOR OPERABILITY range. Pump D/P @ 1175 should be circled as NO. O.B. Pump Brg Vib Horizontal Measure Value is out of the LIMITING RANGE FOR OPERABILITY range. O.B. Pump Brg Vib Horizontal should be circled as NO.	1) Identified that Pump D/P @ 1175 gpm is out of LIMITING RANGE FOR OPERABILITY range. 2) NO has been circled instead of YES. 3) Identified that O.B. Pump Brg Vib Horizontal Measure Value is out of the LIMITING RANGE FOR OPERABILITY range. 4) NO has been circled instead of YES	_____	_____	_____
(C)	4. Report that P-35A is inoperable.	Examinee determines that P-35A is inoperable.	_____	_____	_____

END

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 87 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 12 of 18

3.0 ACCEPTANCE CRITERIA

3.1 Compare results/measured values recorded during P-35A testing with "Acceptable Normal Range" and "Limiting Range for Operability".

Stopwatch M&TE No. DES-017 Cal Due Date 3/5/2010 (1)

TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
VUC-1A	N/A	(✓) if unit Runs (✓)	N/A	Unit Runs	(1) (Yes) No
VUC-1B	N/A	(✓) if unit Runs ()	N/A	Unit Runs	(1) (Yes) No
VUC-1A or VUC-1B	N/A	N/A (2)	N/A	1 of 2 Operable	(Yes) No

Note 1 IF "NO" is circled, THEN declare component inoperable, write a Condition Report, immediately notify the Shift Manager and initiate corrective action. It is not necessary to write a Condition Report for a failure which is already specifically addressed by an open CR, or for a fan out of service for planned maintenance.

Table 2					
TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
Idle Suct Press	SPDS/Alt Test Inst	33.9 psig	> 5 psig	N/A	N/A

Valve	Control Panel	Test Direction	Local Verification (Init.)	Measured Stroke Time (nearest 1/10 sec.)	Acceptable Normal Range (sec.)	Limiting Value For Operability (sec.)	Is Measured Stroke Time Less Than "Limiting Value For Operability"?	Design Bases Value
CV-3804	C19	Open	N/A	2.1	1.2 to 3.6	4.8 (2)	Yes No	N/A
Note 2 Valve stroke time \leq limiting value verifies proper fail safe operation.								

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 88 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 13 of 18

3.0 ACCEPTANCE CRITERIA (continued)

TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
Running Suct Press @~1500 gpm	SPDS/Alt Test Inst	32.9 psig	> 5 psig	N/A	N/A
Discharge Press. @~1500 gpm	SPDS/Alt Test Inst	223 psig	N/A	N/A	N/A
Pump ΔP @~1500 gpm	Disch Press - Running Suct Press	190.1 psid	181.4 to 200.8 psid	175.5 to 200.8 psid	Yes No
Disch Flow	SPDS/Alt Test Inst	1512 gpm	N/A	1500 to 1520 gpm	Yes No
Disch Flow	FIS-2401	1520 gpm	N/A	N/A	N/A
Disch Flow	FIRS-1500	1500 gpm	N/A	N/A	N/A
Motor Running Current	A-304 Ammeter	A Ø 47 amp B Ø 50 amp C Ø 48 amp	N/A	N/A	N/A
Motor Stator Temp	T2440 PMS	°F	N/A	<311°F	Yes N/A No

Valve	Test Direction	Local Verification (Init.)	Measured Stroke	Acceptable Normal Range	Limiting Range For Operability	Is Data Within Limiting Range?	Design Bases Value
BW-6A	Open	N/A	(3) (✓) if valve stroke Sat (✓)	N/A	Valve Stroke Sat	Yes No	N/A
Note 3 Full Stroke is satisfactory when design flow is established.							

KEY

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 89 of 142 CHANGE: 056
--	--	--

SUPPLEMENT 3

Page 14 of 18

3.0 ACCEPTANCE CRITERIA (continued)

Table 6					
TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
IB Pump Brg. Temp	TE-2443 PMS T2443	N/A °F	< 160°F	< 180°F	Yes <u>N/A</u> No
OB Pump Brg. Temp	TE-2444 PMS T2444	N/A °F	< 160°F	< 180°F	Yes <u>N/A</u> No
IB Motor (PP End) Brg. Temp	TE-2442 PMS T2442	N/A °F	N/A	N/A	<u>N/A</u>
OB Motor (MTR End) Brg. Temp	TE-2441 PMS T2441	N/A °F	N/A	N/A	<u>N/A</u>

Table 7					
TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
Running Suct Press @~1175 gpm	SPDS/Alt Test Inst	33.5 psig	> 5 psig	N/A	N/A
Discharge Press. @~1175 gpm	SPDS/Alt Test Inst	256 psig	N/A	N/A	N/A
Pump ΔP @~1175 gpm	Disch Press - Running Suct Press	<u>202.5</u> ³ psid	200.3 to 221.7 psid	193.8 to 221.7 psid	<u>Yes</u> <u>No</u> ⁴
Disch Flow	SPDS/Alt Test Inst	1172 gpm	N/A	1165 to 1185 gpm	N/A

KEY

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 90 of 142 CHANGE: 056
--	--	--

SUPPLEMENT 3

Page 15 of 18

3.0 ACCEPTANCE CRITERIA (continued)

NOTE
Collect vibration data at a flow rate of 1500-1520 gpm.

Table 8					
TEST QUANTITY	INSTRUMENT	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
O.B. Motor Brg Vib (4) (1)	Vibrometer	<i>0.105</i> IN/SEC	N/A	N/A	N/A
I.B. Motor Brg Vib (4) (2)	Vibrometer	<i>0.113</i> IN/SEC	N/A	N/A	N/A
I.B. Pump Brg Vib Vertical (4) (3)	Vibrometer	<i>0.320</i> IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	<u>Yes</u> No
I.B. Pump Brg Vib Horizontal (4) (4)	Vibrometer	<i>0.250</i> IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	<u>Yes</u> No
O.B. Pump Brg Vib Vertical (4) (5)	Vibrometer	<i>0.189</i> IN/SEC	≤ 0.293 IN/SEC	≤ 0.7 IN/SEC	<u>Yes</u> No
O.B. Pump Brg Vib Horizontal (4) (6)	Vibrometer	<i>0.810</i> IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	<u>Yes</u> <u>No</u> 5
O.B. Pump Brg Vib Axial (4) (7)	Vibrometer	<i>0.170</i> IN/SEC	≤ 0.295 IN/SEC	≤ 0.7 IN/SEC	<u>Yes</u> No
Note 4 See attached drawing.					

(KEY)

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 91 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 16 of 18

3.0 ACCEPTANCE CRITERIA (continued)

3.2 IF "NO" is circled in the right-hand column for any component other than a Note 1 component, THEN perform the following:

- Declare P-35A inoperable.
- Verify Condition Report initiated.
- Immediately notify the Shift Manager.
- Initiate corrective action.
- Reference applicable Tech Spec LCO Condition for Required Actions.

3.3 IF any measured values do not satisfy the "Acceptable Normal Range", THEN initiate corrective action.

3.4 Stroke Criteria

3.4.1 Compare measured values/stroke times with "Acceptable Normal Range" and "Limiting Value For Operability".

3.4.2 IF "No" is circled in any Table 3 or 5 space, THEN perform the following:

- Declare that valve inoperable.
- Verify Condition Report initiated.
- Immediately notify the Shift Manager.
- Initiate corrective action.
- Reference applicable Tech Spec LCO Condition for Required Actions.
- IF practical, THEN fail the valve in its ES position.

3.4.3 IF any measured stroke time does not fall within the "Acceptable Normal Range", THEN immediately retest valve or declare that valve inoperable. Refer to "Operability" section of this procedure for additional guidance.

Performed By Belt Page 713 Operator

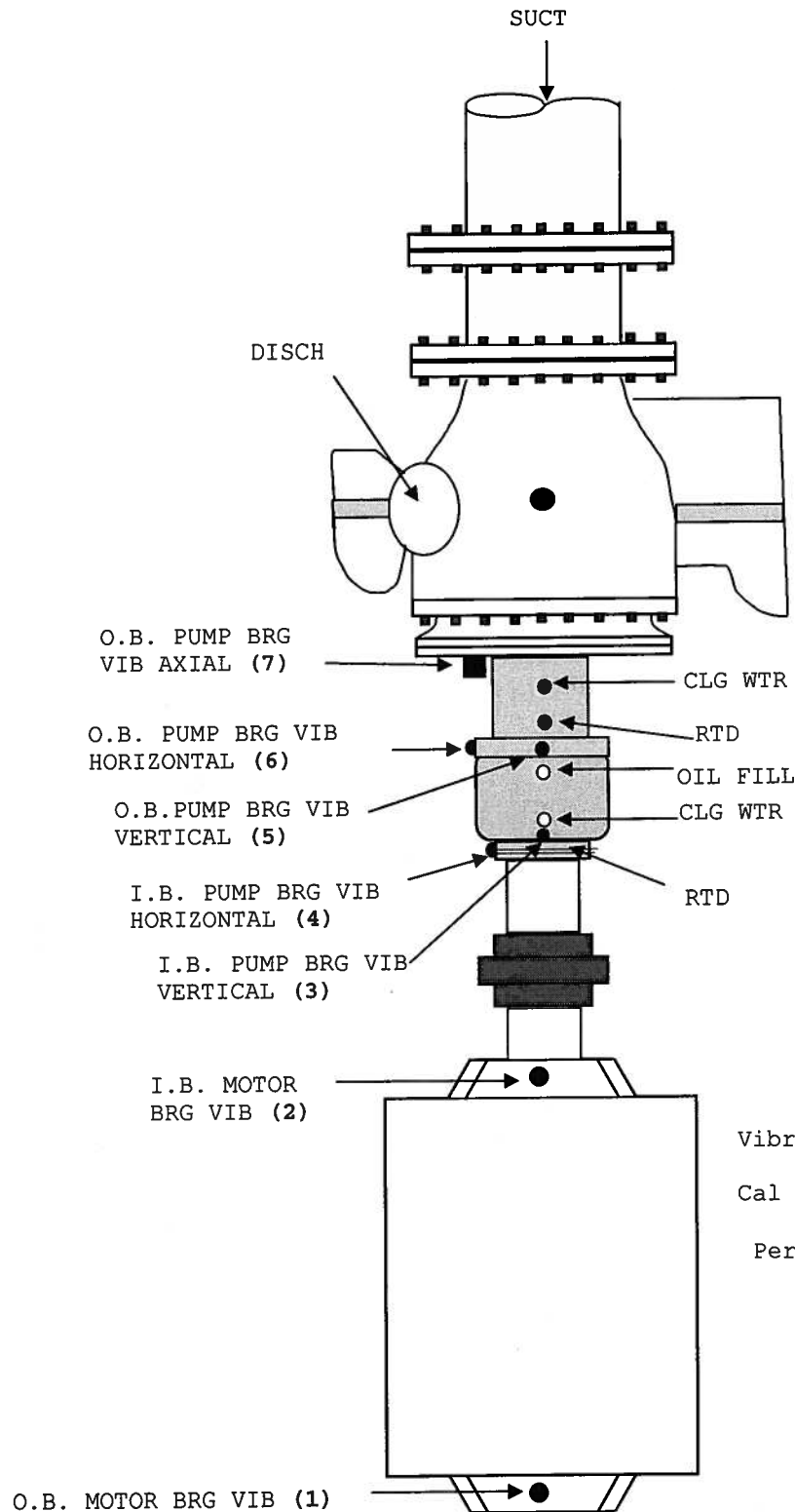
Date/Time 3/12/2010/0240

{KEY}

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 92 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 17 of 18



POINT NO.	VELOCITY (IN/SEC)
1	0.105
2	0.115
3	0.320
4	0.250
5	0.189
6	0.810
7	0.170

Vibrometer No. DVA-011
Cal Due Date 6/30/2010
Performed by Ret Page 713

Hold vibrometer probe tip firmly against the survey point marker, perpendicular to the surface.

{KEY}

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 93 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 18 of 18

4.0 SHIFT MANAGER REVIEW AND ANALYSIS

(circle one)

4.1 Do all measured values/stroke times recorded in the Acceptance Criteria section fall within/less than the specified "Limiting Range/Value For Operability"? YES NO

4.2 Do all measured values recorded in the Acceptance Criteria section fall within the "Acceptable Normal Range"? YES NO

4.2.1 IF "NO" and issue is pump related,
THEN initiate corrective action and double the test frequency until resolved satisfactorily.

4.3 Do all measured valve stroke times recorded in Acceptance Criteria section fall within the "Acceptable Normal Range"? YES NO

4.3.1 IF "NO",
THEN immediately retest valve or declare that valve inoperable. Refer to "Operability" section of this procedure for additional guidance. Initiate corrective action .

4.4 IF answer to either 4.1, 4.2, or 4.3 is "NO",
THEN describe the action taken below.

4.5 Has this equipment been proven operable per the ACCEPTANCE CRITERIA? YES NO

4.6 Have all of the administrative requirements of this test been satisfied (i.e., all initial blocks initialed or N/A'd, all data entered, cal due dates listed, applicable signature spaces signed, etc.)? YES NO

SHIFT MANAGER _____ DATE _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

**The plant is operating at 100% power.
P-35A Quarterly surveillance has been completed
per OP-1104.005 Supplement 3.**

INITIATING CUE:

**The CRS directs you to perform a peer check of 1104.005
Supplement 3 on "A" Reactor Building Spray Pump
surveillance.**

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 89 of 142 CHANGE: 056
--	--	--

SUPPLEMENT 3

Page 14 of 18

3.0 ACCEPTANCE CRITERIA (continued)

Table 6					
TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
IB Pump Brg. Temp	TE-2443 PMS T2443	N/A °F	< 160°F	< 180°F	Yes <u>N/A</u> No
OB Pump Brg. Temp	TE-2444 PMS T2444	N/A °F	< 160°F	< 180°F	Yes <u>N/A</u> No
IB Motor (PP End) Brg. Temp	TE-2442 PMS T2442	N/A °F	N/A	N/A	<u>N/A</u>
OB Motor (MTR End) Brg. Temp	TE-2441 PMS T2441	N/A °F	N/A	N/A	<u>N/A</u>

Table 7					
TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
Running Suct Press @~1175 gpm	SPDS/Alt Test Inst	33.5 psig	> 5 psig	N/A	N/A
Discharge Press. @~1175 gpm	SPDS/Alt Test Inst	256 psig	N/A	N/A	N/A
Pump ΔP @~1175 gpm	Disch Press - Running Suct Press	202.5 psid	200.3 to 221.7 psid	193.8 to 221.7 psid	<u>Yes</u> No
Disch Flow	SPDS/Alt Test Inst	1172 gpm	N/A	1165 to 1185 gpm	N/A

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 90 of 142 CHANGE: 056
--	--	--

SUPPLEMENT 3

Page 15 of 18

3.0 ACCEPTANCE CRITERIA (continued)

NOTE Collect vibration data at a flow rate of 1500-1520 gpm.
--

Table 8					
TEST QUANTITY	INSTRUMENT	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
O.B. Motor Brg Vib (4) (1)	Vibrometer	<i>0.105</i> IN/SEC	N/A	N/A	N/A
I.B. Motor Brg Vib (4) (2)	Vibrometer	<i>0.113</i> IN/SEC	N/A	N/A	N/A
I.B. Pump Brg Vib Vertical (4) (3)	Vibrometer	<i>0.320</i> IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	<u>Yes</u> No
I.B. Pump Brg Vib Horizontal (4) (4)	Vibrometer	<i>0.250</i> IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	<u>Yes</u> No
O.B. Pump Brg Vib Vertical (4) (5)	Vibrometer	<i>0.189</i> IN/SEC	≤ 0.293 IN/SEC	≤ 0.7 IN/SEC	<u>Yes</u> No
O.B. Pump Brg Vib Horizontal (4) (6)	Vibrometer	<i>0.810</i> IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	<u>Yes</u> No
O.B. Pump Brg Vib Axial (4) (7)	Vibrometer	<i>0.170</i> IN/SEC	≤ 0.295 IN/SEC	≤ 0.7 IN/SEC	<u>Yes</u> No
Note 4 See attached drawing.					

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 91 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 16 of 18

3.0 ACCEPTANCE CRITERIA (continued)

3.2 IF "NO" is circled in the right-hand column for any component other than a Note 1 component, THEN perform the following:

- Declare P-35A inoperable.
- Verify Condition Report initiated.
- Immediately notify the Shift Manager.
- Initiate corrective action.
- Reference applicable Tech Spec LCO Condition for Required Actions.

3.3 IF any measured values do not satisfy the "Acceptable Normal Range", THEN initiate corrective action.

3.4 Stroke Criteria

3.4.1 Compare measured values/stroke times with "Acceptable Normal Range" and "Limiting Value For Operability".

3.4.2 IF "No" is circled in any Table 3 or 5 space, THEN perform the following:

- Declare that valve inoperable.
- Verify Condition Report initiated.
- Immediately notify the Shift Manager.
- Initiate corrective action.
- Reference applicable Tech Spec LCO Condition for Required Actions.
- IF practical, THEN fail the valve in its ES position.

3.4.3 IF any measured stroke time does not fall within the "Acceptable Normal Range", THEN immediately retest valve or declare that valve inoperable. Refer to "Operability" section of this procedure for additional guidance.

Performed By

Blt Pje

713

Operator

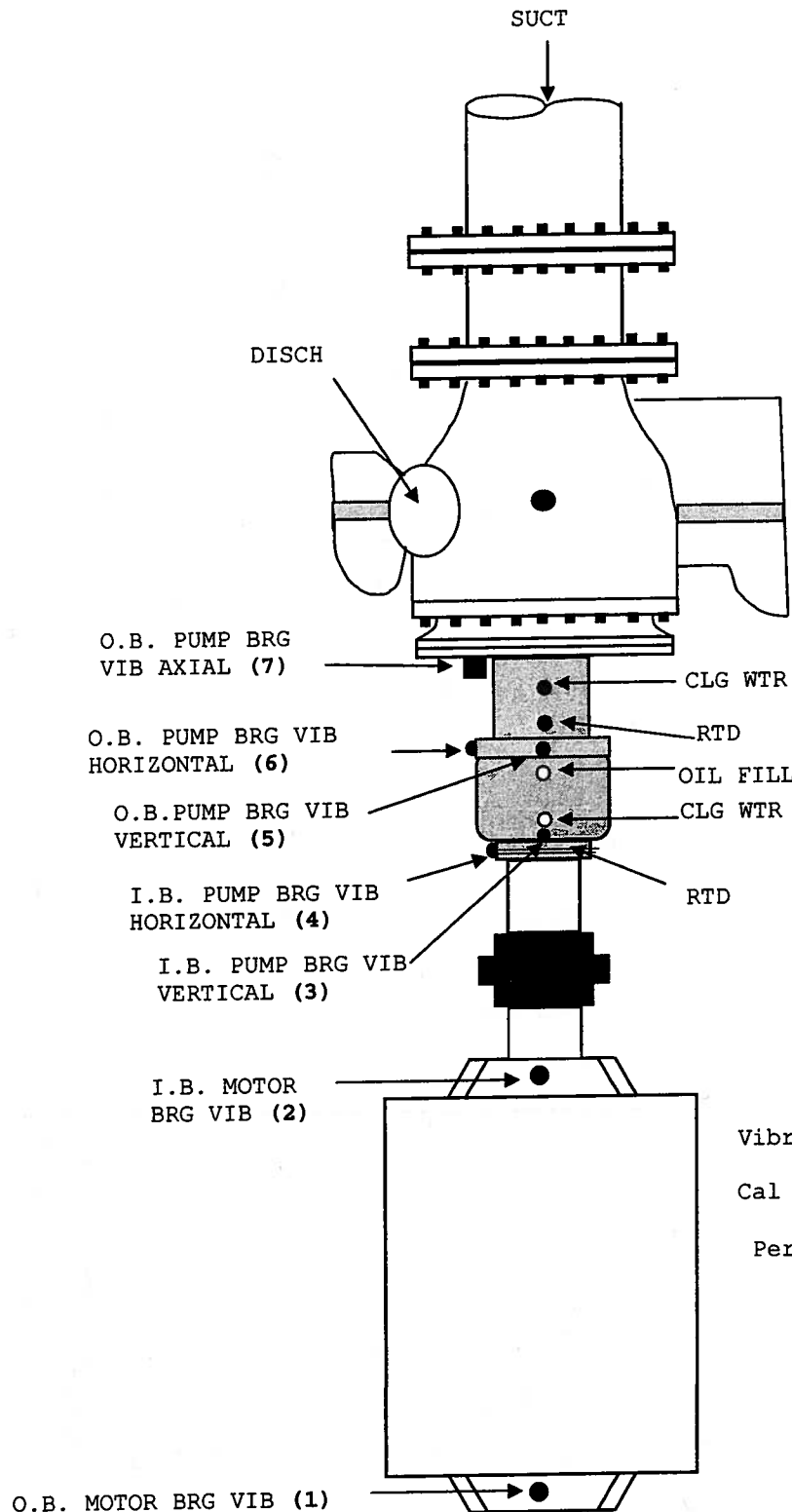
Date/Time

3/12/2010/0240

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 92 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 17 of 18



POINT NO.	VELOCITY (IN/SEC)
1	0.105
2	0.113
3	0.320
4	0.250
5	0.189
6	0.810
7	0.170

Vibrometer No. DVA-011

Cal Due Date 6/30/2010

Performed by Ret Page 713

Hold vibrometer probe tip firmly against the survey point marker, perpendicular to the surface.

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 93 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 18 of 18

4.0 SHIFT MANAGER REVIEW AND ANALYSIS

(circle one)

- 4.1 Do all measured values/stroke times recorded in the Acceptance Criteria section fall within/less than the specified "Limiting Range/Value For Operability"? YES NO
- 4.2 Do all measured values recorded in the Acceptance Criteria section fall within the "Acceptable Normal Range"? YES NO
- 4.2.1 IF "NO" and issue is pump related,
THEN initiate corrective action and double the test frequency until resolved satisfactorily.
- 4.3 Do all measured valve stroke times recorded in Acceptance Criteria section fall within the "Acceptable Normal Range"? YES NO
- 4.3.1 IF "NO",
THEN immediately retest valve or declare that valve inoperable. Refer to "Operability" section of this procedure for additional guidance. Initiate corrective action .
- 4.4 IF answer to either 4.1, 4.2, or 4.3 is "NO",
THEN describe the action taken below.
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- 4.5 Has this equipment been proven operable per the ACCEPTANCE CRITERIA? YES NO
- 4.6 Have all of the administrative requirements of this test been satisfied (i.e., all initial blocks initialed or N/A'd, all data entered, cal due dates listed, applicable signature spaces signed, etc.)? YES NO

SHIFT MANAGER _____ DATE _____

RO ADMIN JPM

A4. RADIATION CONTROL

A1JPM-NRC-ADMINRWP1

ADMINISTRATIVE JOB PERFORMANCE MEASUREUNIT: 1 REV # 1 DATE: _____TUOI NUMBER: A1JPM-NRC-ADMINRWP1SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – Radiation ControlTASK: Ability to comply with radiation work permit requirementsJTA#: ANO1-RO-MUP-NORM-13KA VALUE RO: 3.5 SRO: 3.6 KA REFERENCE: 2.3.7APPROVED FOR ADMINISTRATION TO: RO: X SRO: XTASK LOCATION: INSIDE CR: X OUTSIDE CR: _____ BOTH: _____

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: _____ Classroom: XPOSITION EVALUATED: RO: X SRO: XACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: _____ Classroom: XTESTING METHOD: SIMULATE: _____ PERFORM: XAPPROXIMATE COMPLETION TIME IN MINUTES: 10 MINUTESREFERENCE(S): RWP 20101002

EXAMINEE'S NAME: _____ SSN _____ - _____ - _____

EVALUATOR'S NAME: _____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS
CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____ UNSATISFACTORY: _____

PERFORMANCE CHECKLIST COMMENTS:

_____ Start Time _____ Stop Time _____ Total Time

SIGNED _____ DATE: _____

SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY A
QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

INITIAL PLANT CONDITIONS

- 100% power steady state.
- Maintenance requires your assistance in the lower T-36 Valve Gallery.
- Your total dose for the year is currently 1950 mR.
- The dose rate in the area is 105 mR/hr.

TASK STANDARD:

Use the attached RWP, 2010-1002 Task 1.

Using the above information determine your MAXIMUM stay time in the lower valve gallery.

TASK PERFORMANCE AIDS: RWP 20101002

SIMULATOR SETUP: NA

ADMINISTRATIVE JOB PERFORMANCE MEASURE**INITIATING CUE:**

Use the attached RWP, 2010-1002 Task 1.

Using the above information determine your **MAXIMUM** stay time in the lower valve gallery.

CRITICAL ELEMENTS (C): 2 and 4

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Recognize the dose limit per the RWP is 20 mR.	Examinee identifies that the RWP Dose Alarm is set at 20 mR Student may also identify that the Dose Rate Alarm is set at 200 mR/hr.	_____	_____	_____
(C)	2. Determine stay time based on the given dose in the area not to exceed RWP limit of 20 mR.. $\frac{20 \text{ mR}}{105 \text{ mR/hr}} \times \frac{60 \text{ min}}{1 \text{ hr}} = 11.4 \text{ minutes}$	Examinee determines that the RWP Dose Alarm limit is set at 20 mR which would allow him to stay 11.4 minutes. Student may also identify that the Dose Rate Alarm is set at 200 mR/hr.	_____	_____	_____
	3. Determine stay time based on the given dose in the area not to exceed annual dose limits. $\frac{50 \text{ mR}}{105 \text{ mR/hr}} \times \frac{60 \text{ min}}{1 \text{ hr}} = 28.5 \text{ minutes}$	Examinee determines stay time based on Annual Dose Limit of 2000 mR would allow him to stay for 28.5 minutes.	_____	_____	_____
(C)	4. Determine maximum stay time based on the given dose in the area.	Examinee identifies that the RWP Dose Alarm is the most limiting and the MAXIMUM stay time is 11.4 minutes.	_____	_____	_____

END

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- 100% power steady state.
- Maintenance requires your assistance in the lower T-36 Valve Gallery.
- Your total dose for the year is currently 1950 mR.
- The dose rate in the area is 105 mR/hr

INITIATING CUE:

Use the attached RWP, 2010-1002 Task 1.

**Using the above information determine your
MAXIMUM stay time in the lower valve gallery.**

RADIOLOGICAL WORK PERMIT

RWP Title: OPERATIONS ACTIVITIES UNIT-1		RWP No.: 20101002 <small>Rev. 00</small>	
Comments:		*20101002*	
RWP Type: GENERAL	RWP Status: ACTIVE	Begin Date: 1/1/2010	Close On Date: 12/31/2010
Prepared By: NICKELS, THOMAS W		Job Supervisor: Randall Walters	
Estimated Dose: 660 mrem	Estimated Hours: 13,500.00	Actual Dose: 1 mrem	Actual Hours: 93.55

Locations		
Buildings	Elevations	Rooms
LOW LEVEL RADWASTE BUILDING	354	NON-LOCKED HIGH RADIATION AREA
OLD RADWASTE BUILDING	354	NON-LOCKED HIGH RADIATION AREA
OUTSIDE CONTROLLED ACCESS	ALL	OUTSIDE CONTROLLED ACCESS
UNIT 1 AUXILIARY BUILDING	ALL	NON-LOCKED HIGH RADIATION AREA

Radiological Conditions		
Description	Value	Unit
Smear data is in dpm/100 cm2 unless otherwise noted.	<1K - 40K	DPM/100CM2
General area gamma dose rates are in mrem/hour unless otherwise noted.	0.1 - 200	MILLIREM/HOUR

Tasks		
Task	Description	Status
1	OPERATIONS ACTIVITIES UNIT-1	Active

Requirements	
Requirement Groups	Requirement Descriptions
N/A	

Additional Instructions
Instructions 1:
Instructions 2:
Instructions 3:

Approvals		
Approver Title	Name	Date
ALARA REVIEW	SMITH, TIMOTHY R	12/16/2009
RWP PREPARER	SMITH, TIMOTHY R	12/16/2009
RP SUPERVISOR	MARVEL JR, STANLEY D	12/21/2009

Attachments
N/A

RADIOLOGICAL WORK PERMIT

<u>Task Number:</u> 1		<u>RWP No.:</u> 20101002	
		<u>Rev.:</u> 00	
<u>Task Description:</u> OPERATIONS ACTIVITIES UNIT-1		<u>Task Status:</u> Active	
<u>Estimate Dose:</u> 660.00		<u>Estimate Hours:</u> 13,500.00	
<u>Hi-Rad:</u> Yes	<u>Hot Particle:</u> No	<u>Locked Hi-Rad:</u> No	<u>Hi-Contamination:</u> No
Alarm Settings			
<u>Dose Alarm</u> (mrem)	20.00	<u>Dose Rate</u> (mrem/hr)	200.00

RADIOLOGICAL WORK PERMIT

Task Number: 1		RWP No.: 20101002
		Rev.: 00
Requirements		
Requirement Groups	Requirement Descriptions	
Contamination Control	Use RP approved mats or pads when kneeling, sitting or laying in contaminated areas.	
	Notify RP when exposing a contaminated surface or opening a contaminated system.	
	RP will expand or set up a contamination/ high contamination area to allow the work to be performed,	
	All materials are required to be surveyed in a small articles monitor or hand frisked by RP (with RP Supervisor approval) PRIOR TO unconditional release from a Radiologically Controlled Area.	
	Upon exit of an RCA, whole body monitoring is required utilizing a whole body contamination monitor (PCM-1B or equivalent). A whole body gamma monitor must also be cleared (PM-7 or equivalent). IF the RCA is a satellite RCA with no whole body contamination monitor available, THEN the radworker should: a) perform a hand and foot frisk. b) IF the frisk indicates contamination is present, THEN contact RP. c) IF the frisk DOES NOT indicate the presence of contamination, THEN proceed to the nearest whole body contamination monitor.	
	Reaching across a contamination boundary is permitted with RP approval and the use of surgeon's gloves OR cotton liners with rubber gloves. When reaching into the area of higher contamination, gloves must be removed when hands are returned to the lower level side of the boundary.	
	When exiting the Controlled Access Area (CAA) personnel must perform whole body monitoring using whole body contamination monitor (PCM-1B or equivalent) and whole body gamma monitor (PM-7 or equivalent).	
Dosimetry Requirements	Upon exiting areas posted as "Contamination Area", perform a hand and foot frisk at the designated frisker location.	
	If an EAD dose rate alarm occurs: 1) Secure Work. 2) Back out of the immediate area until the alarm clears. 3) Notify others in your work crew. 4) Immediately notify RP for further instructions.	
	Whole body DLR and EAD required for entry.	
	If an EAD dose alarm occurs: 1) Secure Work. 2) Immediately leave the RCA. 3) Notify RP.	
	FOR WORK IN HIGH RADIATION AREAS - If your work conditions are in OR will cause hearing impairment (such as work in a high noise area, use of a communications headset, etc.) THEN the use of an EAD amplifying device (PAM) is required.	
Engineering Controls	Periodically check your EAD. This check should be performed more frequently in areas where your ability to hear is diminished.	
	When using temporary hoses to vent or drain a radioactive system, ensure the hose is labeled for radioactive system use only.	
Exposure Reduction	When venting or draining, monitor the rate of system drain to ensure the rate of drain does NOT exceed the capacity of the floor drain.	
	Use Low Dose Waiting Areas whenever possible to minimize exposure.	
Protective Requirements	All joints between Anti-C gloves /sleeves and Anti-C ankles/ booties must be taped.	
	Entry into High Contamination Areas require double Anti-Cs .	
	Entry into Contamination Areas require single Anti-Cs.	
RP Coverage	Entry into High Radiation Areas requires a radiological brief from RP, AND an electronic alarming dosimeter (EAD) to meet Tech Spec monitoring requirements.	
	Contact RP Supervisor or RP tech prior to entry to verify adequate RP coverage and contamination controls for your work activity. RP is not required to be notified for entries to the Auxiliary Building to perform routine activities that do not involve High Radiation Areas, Contamination Areas, overhead entry or system breach.	

RADIOLOGICAL WORK PERMIT

<u>Task Number:</u> 1	<u>RWP No.:</u> 20101002 <u>Rev.:</u> 00
	<p>A "Cat 3 Advanced Radworker" may enter posted High Radiation Areas if he/she is using a gamma sensitive RP instrument to monitor dose rates. (NOTE: An EAD is NOT an appropriate survey instrument. LHRA/ VHRA entry requires continuous RP coverage.).</p> <p>Notify RP when performing operations activities which could change plant radiological conditions. For example venting/draining radioactive systems, performing degas or decay heat/shutdown cooling operations, or other non routine system functions.</p> <p>Initial / Intermittent RP coverage is required for entry in to High Radiation Areas.</p>
Radiological Conditions	<p>Radiological conditions should be reviewed to ensure awareness of conditions in your work area. This information can be obtained from either a Status Board or RP personnel.</p> <p>Contact Radwaste Personnel for radiological conditions in the Radwaste Buildings.</p>
Respiratory Protection	<p>Based on historical and current data, the airborne radioactivity is less than 30 percent of a DAC. Respiratory protection is not required unless otherwise directed by RP Supervision.</p>
Special Radiological Requirements	<p>Critical Step - Prior to movement of irradiated fuel or other irradiated materials, notify RP Shift Tech or RP Supervisor that movement of fuel / irradiated components is going to occur. DO NOT move fuel or irradiated components near cask loading gate or tilt pit gate when the adjacent pit is drained as this can result in high general area dose rates.</p> <p>The prerequisite for a secondary resin transfer include 1) Secure the fill head such that changes in pressure will not cause a spill. 2) Conduct a walkdown (pre-transfer) to ensure that hose connections and leak integrity is satisfactory. 3) Construct a berm sufficient to contain the material being transferred.</p>
Stop Work Criteria	<p>Critical Step - Radiation dose rates in the immediate area are greater than the EAD dose rate alarm set point.</p> <p>Critical Step - Work involving alpha contamination greater than or equal to 100 dpm/100cm² CAN NOT be worked on a General RWP.</p> <p>Critical Step - Indications either from local samples or remote indication (CAM) of airborne radioactivity in quantities in excess of 30 percent of a DAC.</p>

Additional Instructions
<u>Instructions 1:</u>
<u>Instructions 2:</u>
<u>Instructions 3:</u>
Attachments
N/A

SRO ADMIN JPM

A1. Conduct of Operations

A1JPM-NRC-ADMINSFPMU1

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-NRC-ADMINSFPMU1

Page 1 of 4

UNIT: 1 REV # 0 DATE: _____

TUOI NUMBER: A1JPM-NRC-ADMINSFPMU1

SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – CONDUCT OF OPERATIONS

TASK: Review Spent Fuel Pool Makeup Calculation

JTA#: ANO1-SRO-CA-NORM-20

KA VALUE RO: 4.3 SRO: 4.4 KA REFERENCE: 2.1.23

APPROVED FOR ADMINISTRATION TO: RO: _____ SRO: X

TASK LOCATION: INSIDE CR: _____ OUTSIDE CR: _____ Classroom : X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: _____ Classroom: PERFORM

POSITION EVALUATED: RO: _____ SRO: X

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: _____ Classroom: PERFORM

TESTING METHOD: SIMULATE: _____ PERFORM: X

APPROXIMATE COMPLETION TIME IN MINUTES: 15 MINUTES

REFERENCE(S): OP-1104.003 Attachment C2

EXAMINEE'S NAME: _____ SSN _____ - _____ - _____

EVALUATOR'S NAME: _____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS
CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____ UNSATISFACTORY: _____

PERFORMANCE CHECKLIST COMMENTS:

_____ Start Time _____ Stop Time _____ Total Time

SIGNED _____ DATE: _____

SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY A
QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-NRC-ADMINSFPMU1

Page 2 of 4

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS: _____ The plant is at 100% with no dry fuel operations in progress.

The CBOT has just given you a completed Spent Fuel Pool Makeup calculation for review.

TASK STANDARD: Examinee correctly identifies the fact that the CBOT used the wrong volume / foot depth in performing the makeup calculations.

TASK PERFORMANCE AIDS: OP-1104.003 Attachment C2

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-NRC-ADMINSFPMU1

Page 3 of 4

INITIATING CUE:

As Control Room Supervisor, review the completed Spent Fuel Pool Makeup Calculation per OP-1104.003 Attachment C2.

CRITICAL ELEMENTS (C) 2 and 3

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Review calculation and identify the fact that the CBOT used the wrong gate alignment for the given plant conditions.	Identify the following error: Step 2.0 Used information based on the Tilt Pit Gate being removed. (Gate is actually installed)	_____	_____	_____
(C)	2. Identify the fact that the CBOT used the wrong value for SFP volume per foot which is carried through and effects the overall calculation.	Identify the following error: Step 2.0 Used 9624 gal/ft (Should have used 8349 gal/ft)	_____	_____	_____
(C)	3. As a result of the error with the volume the examinee should identify additional errors carried forward.. Examinee: recalculates and makeup amount listed as 1669.8 gallons plus or minus 10 gallons Recalculates Final Spent Fuel Pool boron concentration 2637 ppmB plus or minus 1ppmB	Identify the following errors: Step 2.0 V _{fd} is 1924.8 gal (Should have been 1669.8 gallons) Step 6.0 Final Spent Fuel Pool concentration 2635 ppmB (Should have been 2637 ppmB) Examinee: recalculates and makeup amount listed as 1669.8 gallons plus or minus 10 gallons Recalculates Final Spent Fuel Pool boron concentration 2637 ppmB plus or minus 1ppmB	_____	_____	_____
	4. Complete review of Attachment C2 Calculation.	Notify RO of errors and direct him to re-perform calculation.	_____	_____	_____

END

ATTACHMENT C2

SF POOL FEED CALCULATIONS

Page 1 of 7

TABLE 1
Spent Fuel Pool and Systems Volume/Ft Depth

SF Pool (gal/ft)	SF Pool + Cask Pit (gal/ft)	SF Pool + Tilt Pit (gal/ft)	SF Pool + Cask Pit + Tilt Pit (gal/ft)	Refueling Canal (gal/ft)	Incore Tank (gal/ft)
7,570	8,349	8,845	9,624	11,070	1,141

TABLE 2
Spent Fuel Pool and Systems Volume
(gallons)

Elev. (ft)	LI-2004	SF Pool	SF Pool + Cask Pit	SF Pool + Tilt Pit ⁽¹⁾	+ Cask Pit + Tilt Pit ⁽¹⁾	Refueling Canal	Incore Tank
401.5	+1.0 ft	298,120	330,899	343,537	376,316	During refueling, canal level must be maintained between -0.5 and 0.0 on the SFP Level indicator (LI-2004).	
401.4	+0.9 ft	297,363	330,064	342,653	375,354		
401.3	+0.8 ft	296,606	329,229	341,768	374,392		
401.2	+0.7 ft	295,849	328,394	340,884	373,429		
401.1	+0.6 ft	295,092	327,559	339,999	372,467		
401.0	+0.5 ft	294,335	326,725	339,115	371,504		
400.9	+0.4 ft	293,578	325,890	338,230	370,542		
400.8	+0.3 ft	292,821	325,055	337,346	369,580		
400.7	+0.2 ft	292,064	324,220	336,461	368,617		
400.6	+0.1 ft	291,307	323,385	335,577	367,655		
400.5	0.0 ft	290,550	322,550	334,692	366,692	342,800	27,400
400.4	-0.1 ft	289,793	321,715	333,808	365,730	341,693	27,286
400.3	-0.2 ft	289,036	320,880	332,923	364,768	340,586	27,172
400.2	-0.3 ft	288,279	320,045	332,039	363,805	339,479	27,058
400.1	-0.4 ft	287,522	319,210	331,154	362,843	338,372	26,944
400.0	-0.5 ft	286,765	318,376	330,270	361,880	337,265	26,830
399.9	-0.6 ft	286,008	317,541	329,385	360,918	336,158	26,715
399.8	-0.7 ft	285,251	316,706	328,501	359,956	335,051	26,601
399.7	-0.8 ft	284,494	315,871	327,616	358,993	333,944	26,487
399.6	-0.9 ft	283,737	315,036	326,732	358,031	332,837	26,373
399.5	-1.0 ft	282,980	314,201	325,847	357,068	331,730	26,259
399.4	-1.1 ft	282,223	313,366	324,963	356,106	330,623	26,145
399.3	-1.2 ft	281,466	312,531	324,078	355,143	329,516	26,031
399.2	-1.3 ft	280,709	311,696	323,194	354,181	328,409	25,917
399.1	-1.4 ft	279,952	310,861	322,309	353,219	327,302	25,803
399.0	-1.5 ft	279,195	310,026	321,425	352,256	326,195	25,689

(1) Tilt Pit volume from CR-ANO-1-2008-1859-CA2.

KEY

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 54 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 2 of 7

NOTE

It is necessary to coordinate with Dry Fuel Personnel when making up to the Spent Fuel Pool during Dry Fuel Operations.

Step 1.0 is solely performed to determine volume of boric acid at a known concentration to achieve a desired final SFP boron concentration, and generally would not be used.

CAUTION

Performance of this section requires verification that feed volume will not result in overflowing of the SFP or other attached volumes.

N/A IF it is desired to calculate the volume of boric acid required to achieve a desired final SFP concentration, THEN perform the following:

N/A Determine initial SF Pool volume from TABLE 2. Interpolate if necessary.

1.1.1 IF appropriate,
THEN add Refueling Canal and Incore Tank volume.

V_i = _____ gal = Initial Volume from TABLE 2

N/A Record the following data:

C_i = _____ ppmB = Initial SF Pool concentration

C_f = _____ ppmB = Final desired SF Pool concentration

C_{fd} = _____ ppmB = Feed concentration to be added to SF Pool

N/A Determine feed volume to be added to the SF Pool

$$V_{fd} = \frac{(V_i) \times (C_f - C_i)}{(C_{fd} - C_f)}$$

$$V_{fd} = \frac{(\quad) \times (\quad - \quad)}{(\quad - \quad)}$$

V_{fd} = _____ gal.

{KEY}

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 55 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 3 of 7

~~2.0~~

Determine final SF Pool volume

Final volume = (V_{fd}) + (V_i)

Final volume = () + ()

Final = _____ gal.
Volume

~~2.0~~
NOTE

If final SF Pool level is determined to be greater than +1.0 ft or greater than zero when refueling, then the addition will have to be made in separate operations.

~~2.0~~

Determine final SF Pool level from TABLE 2, interpolate as necessary.

1.5.1 IF final volume greater than table values
THEN a second addition will have to be done following a level reduction.

~~2.0~~

Perform the other sections of this Attachment as required.

~~2.0~~

IF needed,

THEN find the volume of feed (V_{fd}) AND use TABLE 1 for SF Pool gal/ft.

IF Refueling Canal or Incore Tank is connected to SF Cooling System
THEN add the appropriate gal/ft to the SF Pool gal/ft.

$V_{fd} = [(\text{Final level}) - (\text{Initial level})] \times (\text{gal/ft})$

$V_{fd} = [(\underline{0} \text{ ft.}) - (\underline{-0.2} \text{ ft.})] \times (\underline{9624} \text{ gal/ft})$

$V_{fd} = \underline{1924.8} \text{ gal.}$

KEY

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 56 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 4 of 7

NOTE

Step 3.0 is necessary only to find the feed concentration needed to achieve a final specific SF Pool concentration. Normally this is not needed. For most additions the feed concentration is known, because most makeups will be straight DI water, a makeup no concentration change, or other estimated feed concentration.

PLA

IF a final specific SF Pool concentration is desired,
THEN find concentration of feed solution (C_{fd}) as follows:

PLA

Record the following data:

C_f = _____ ppmB = Final desired SF Pool concentration

C_i = _____ ppmB = Initial SF Pool concentration

V_{fd} = _____ gal = Volume of feed from step 2.0.

PLA

Determine final SF Pool volume from table. Interpolate if necessary.
IF appropriate,
THEN add Refueling Canal and Incore Tank volume.

V_f = _____ gal = Final Volume from TABLE 2

PLA

Determine initial SF Pool volume from table. Interpolate if necessary. IF appropriate,
THEN add Refueling Canal and Incore Tank volume.

V_i = _____ gal = Initial Volume from TABLE 2

3 PLA

Calculate concentration of feed solution (C_{fd}):

$$C_{fd} = \frac{[(V_f) \times (C_f)] - [(V_i) \times (C_i)]}{(V_{fd})}$$

$$C_{fd} = \frac{[() \times ()] - [() \times ()]}{()}$$

C_{fd} = _____ ppmB

(KEY)

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 57 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 5 of 7

7/1/04

IF this makeup is a combination of DI water and boric acid,
THEN find ratio of water and acid.

4/1/04

Find volume of boric acid (V_B):

V_{fd} = _____ gal = Volume of feed from step 2.0

C_{fd} = _____ ppmB = desired concentration of feed solution

C_b = _____ ppmB = boron concentration of boric acid source

$$V_B = \frac{(V_{fd}) \times (C_{fd})}{(C_b)}$$

$$V_B = \frac{(\quad) \times (\quad)}{(\quad)}$$

Boric acid volume = _____ gal.

4/1/04

Find volume of DI water (V_{DI}):

$$V_{DI} = (V_{fd}) - (V_B)$$

$$V_{DI} = (\quad) - (\quad)$$

DI water volume = _____ gal.

6
KEY

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 58 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 6 of 7

5/1/02

IF feed solution will be a combination of two boric acid solutions,
THEN calculate volume of each solution to be added as follows:

5/1/02

Record the following data:

V_{fd} = _____ gals = Δ SFP volume in gals. (from step 2.0)

C_{fd} = _____ ppmB = concentration of feed solution (from step 3.4)
or estimated or desired feed concentration.

C_{B1} = _____ ppmB = boron concentration of 1st B.A. feed.

C_{B2} = _____ ppmB = boron concentration of 2nd B.A. feed.

5/1/02

Calculate volume of first solution B_1 at concentration C_{B1} to add:

$$B_1 = \frac{(V_{fd})(C_{fd} - C_{B2})}{(C_{B1} - C_{B2})} = \text{first boric acid solution}$$

$$B_1 = \frac{(\quad)(\quad - \quad)}{(\quad - \quad)} = \text{first boric acid solution}$$

B_1 = _____ gal.

5/1/02

Calculate volume of second solution B_2 at concentration C_{B2} to add:

$$B_2 = (V_{fd}) - (B_1) = \text{second boric acid feed solution}$$

$$B_2 = (\quad) - (\quad)$$

B_2 = _____ gal.

(KEY)

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 59 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 7 of 7

~~6.0~~ IF step 3.0 is N/A,
OR step 5.1 C_{fd} is < SFP concentration,
THEN perform the following conservative estimate of final SF Pool concentration:

~~6.1~~ Record the following. Determine initial SF Pool volume from TABLE 2. Interpolate if necessary.
IF appropriate,
THEN add Refueling Canal and Incore Tank volume.

V_i = 320,880 gal. = Initial Volume from TABLE 2

C_i = 2651 ppmB = Initial SF Pool concentration

V_{fd} = 19248 gal. = Volume of feed from step 2.0.

C_{fd} = -0- ppmB = Feed concentration. IF DI water only,
THEN this is "0".

$$\text{Final SF Pool conc.} = \frac{(V_i)(C_i) + (V_{fd})(C_{fd})}{(V_i) + (V_{fd})}$$

$$\text{Final SF Pool conc.} = \frac{(320880)(2651) + (19248)(-0-)}{(320880) + (19248)}$$

Final SF Pool conc. = 2635 ppmB

(3)

7.0 Inform Chemistry of estimated change in SFP boron concentration.

Work Performed By Rlt Rye Time 0800 Date 3/10/10

Calculations Reviewed/
Verified By CRS/SM: _____ Time _____ Date _____

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- The plant is at 100% power.
- No Dry fuel operations in progress.
- CBOT has completed the calculation for a Spent Fuel Pool Makeup with DI water.
- Spent Fuel Boron is 2651 ppmB
- Initial SFP Level is -0.2 feet.
- Final desired level is 0.0 feet.
- Tilt Pit Gate is installed.
- Cask Loading Pit Gate is removed.

INITIATING CUE:

As Control Room Supervisor, review the completed Spent Fuel Pool Makeup Calculation per OP-1104.003 Attachment C2.

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 54 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 2 of 7

NOTE

It is necessary to coordinate with Dry Fuel Personnel when making up to the Spent Fuel Pool during Dry Fuel Operations.

Step 1.0 is solely performed to determine volume of boric acid at a known concentration to achieve a desired final SFP boron concentration, and generally would not be used.

CAUTION

Performance of this section requires verification that feed volume will not result in overflowing of the SFP or other attached volumes.

N/A IF it is desired to calculate the volume of boric acid required to achieve a desired final SFP concentration, THEN perform the following:

N/A Determine initial SF Pool volume from TABLE 2. Interpolate if necessary.

1.1.1 IF appropriate, THEN add Refueling Canal and Incore Tank volume.

$V_i = \text{_____ gal} = \text{Initial Volume from TABLE 2}$

N/A Record the following data:

$C_i = \text{_____ ppmB} = \text{Initial SF Pool concentration}$

$C_f = \text{_____ ppmB} = \text{Final desired SF Pool concentration}$

$C_{fd} = \text{_____ ppmB} = \text{Feed concentration to be added to SF Pool}$

N/A Determine feed volume to be added to the SF Pool

$$V_{fd} = \frac{(V_i) \times (C_f - C_i)}{(C_{fd} - C_f)}$$

$$V_{fd} = \frac{(\text{_____}) \times (\text{_____} - \text{_____})}{(\text{_____} - \text{_____})}$$

$V_{fd} = \text{_____ gal.}$

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 55 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 3 of 7

~~ADA~~

Determine final SF Pool volume

Final volume = (V_{fd}) + (V_i)

Final volume = () + ()

Final = _____ gal.
Volume

~~NOTE~~

If final SF Pool level is determined to be greater than +1.0 ft or greater than zero when refueling, then the addition will have to be made in separate operations.

~~ADA~~

Determine final SF Pool level from TABLE 2, interpolate as necessary.

1.5.1 IF final volume greater than table values
THEN a second addition will have to be done following a level reduction.

~~ADA~~

Perform the other sections of this Attachment as required.

~~2/0~~

IF needed,

THEN find the volume of feed (V_{fd}) AND use TABLE 1 for SF Pool gal/ft.

IF Refueling Canal or Incore Tank is connected to SF Cooling System
THEN add the appropriate gal/ft to the SF Pool gal/ft.

$V_{fd} = [(Final\ level) - (Initial\ level)] \times (\text{gal/ft})$

$V_{fd} = [(\underline{0} \text{ ft.}) - (\underline{-0.2} \text{ ft.})] \times (\underline{9624} \text{ gal/ft})$

$V_{fd} = \underline{1924.8} \text{ gal.}$

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 56 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 4 of 7

NOTE

Step 3.0 is necessary only to find the feed concentration needed to achieve a final specific SF Pool concentration. Normally this is not needed. For most additions the feed concentration is known, because most makeups will be straight DI water, a makeup no concentration change, or other estimated feed concentration.

IF a final specific SF Pool concentration is desired,
THEN find concentration of feed solution (C_{fd}) as follows:

Record the following data:

C_f = _____ ppmB = Final desired SF Pool concentration

C_i = _____ ppmB = Initial SF Pool concentration

V_{fd} = _____ gal = Volume of feed from step 2.0.

Determine final SF Pool volume from table. Interpolate if necessary.
IF appropriate,
THEN add Refueling Canal and Incore Tank volume.

V_f = _____ gal = Final Volume from TABLE 2

Determine initial SF Pool volume from table. Interpolate if necessary. IF appropriate,
THEN add Refueling Canal and Incore Tank volume.

V_i = _____ gal = Initial Volume from TABLE 2

Calculate concentration of feed solution (C_{fd}):

$$C_{fd} = \frac{[(V_f) \times (C_f)] - [(V_i) \times (C_i)]}{(V_{fd})}$$

$$C_{fd} = \frac{[() \times ()] - [() \times ()]}{()}$$

C_{fd} = _____ ppmB

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 57 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 5 of 7

(Handwritten initials)

IF this makeup is a combination of DI water and boric acid,
THEN find ratio of water and acid.

(Handwritten initials)

Find volume of boric acid (V_B):

$V_{fd} = \underline{\hspace{2cm}}$ gal = Volume of feed from step 2.0

$C_{fd} = \underline{\hspace{2cm}}$ ppmB = desired concentration of feed solution

$C_b = \underline{\hspace{2cm}}$ ppmB = boron concentration of boric acid source

$$V_B = \frac{(V_{fd}) \times (C_{fd})}{(C_b)}$$

$$V_B = \frac{(\hspace{2cm}) \times (\hspace{2cm})}{(\hspace{2cm})}$$

Boric acid volume = gal.

(Handwritten initials)

Find volume of DI water (V_{DI}):

$$V_{DI} = (V_{fd}) - (V_B)$$

$$V_{DI} = (\hspace{2cm}) - (\hspace{2cm})$$

DI water volume = gal.

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 58 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 6 of 7

~~5/1/02~~

IF feed solution will be a combination of two boric acid solutions,
THEN calculate volume of each solution to be added as follows:

~~5/1/02~~

Record the following data:

V_{fd} = _____ gals = Δ SFP volume in gals. (from step 2.0)

C_{fd} = _____ ppmB = concentration of feed solution (from step 3.4)
or estimated or desired feed concentration.

C_{B1} = _____ ppmB = boron concentration of 1st B.A. feed.

C_{B2} = _____ ppmB = boron concentration of 2nd B.A. feed.

~~5/1/02~~

Calculate volume of first solution B_1 at concentration C_{B1} to add:

$$B_1 = \frac{(V_{fd})(C_{fd} - C_{B2})}{(C_{B1} - C_{B2})} = \text{first boric acid solution}$$

$$B_1 = \frac{(\quad)(\quad - \quad)}{(\quad - \quad)} = \text{first boric acid solution}$$

B_1 = _____ gal.

~~5/1/02~~

Calculate volume of second solution B_2 at concentration C_{B2} to add:

$$B_2 = (V_{fd}) - (B_1) = \text{second boric acid feed solution}$$

$$B_2 = (\quad) - (\quad)$$

B_2 = _____ gal.

PROC./WORK PLAN NO. 1104.003	PROCEDURE/WORK PLAN TITLE: CHEMICAL ADDITION	PAGE: 59 of 127 CHANGE: 046
---------------------------------	---	--------------------------------

ATTACHMENT C2

Page 7 of 7

~~6.0~~ IF step 3.0 is N/A,
OR step 5.1 C_{fd} is < SFP concentration,
THEN perform the following conservative estimate of final SF Pool concentration:

~~6.1~~ Record the following. Determine initial SF Pool volume from TABLE 2. Interpolate if necessary.
IF appropriate,
THEN add Refueling Canal and Incore Tank volume.

V_i = 320,880 gal. = Initial Volume from TABLE 2

C_i = 2651 ppmB = Initial SF Pool concentration

V_{fd} = 19248 gal. = Volume of feed from step 2.0.

C_{fd} = -0- ppmB = Feed concentration. IF DI water only,
THEN this is "0".

$$\text{Final SF Pool conc.} = \frac{(V_i)(C_i) + (V_{fd})(C_{fd})}{(V_i) + (V_{fd})}$$

$$\text{Final SF Pool conc.} = \frac{(320880)(2651) + (19248)(-0-)}{(320880) + (19248)}$$

Final SF Pool conc. = 2635 ppmB

7.0 Inform Chemistry of estimated change in SFP boron concentration.

Work Performed By Rlt Rye Time 0800 Date 3/10/10

Calculations Reviewed/
Verified By CRS/SM: _____ Time _____ Date _____

SRO ADMIN JPM

A2. Conduct of Operations

A1JPM-NRC-ADMINCHEM1

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-NRC-ADMINCHEM1

Page 1 of 4

UNIT: 1 REV # 1 DATE: _____

TUOI NUMBER: A1JPM-NRC-ADMINCHEM1

SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – CONDUCT OF OPERATIONS

TASK: Respond to secondary chemistry parameter out of specification

JTA#: ANO-SM-ADMIN-NORM-165

KA VALUE RO: 2.7 SRO: 3.5 KA REFERENCE: 2.1.34

APPROVED FOR ADMINISTRATION TO: RO: _____ SRO: X

TASK LOCATION: INSIDE CR: _____ OUTSIDE CR: _____ Classroom: X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: _____ Classroom: PERFORM

POSITION EVALUATED: RO: _____ SRO: X

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: _____ Classroom: PERFORM

TESTING METHOD: SIMULATE: _____ PERFORM: X

APPROXIMATE COMPLETION TIME IN MINUTES: 15 MINUTES

REFERENCE(S): 1000.042 Steam Generator Water Chemistry Monitoring – Unit One

EXAMINEE'S NAME: _____ SSN _____ - _____ - _____

EVALUATOR'S NAME: _____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS
CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____ UNSATISFACTORY: _____

PERFORMANCE CHECKLIST COMMENTS:

_____ Start Time _____ Stop Time _____ Total Time

SIGNED _____ DATE: _____

SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY A
QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-NRC-ADMINCHEM1

Page 2 of 4

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS: The plant has been operating at 100% for 215 days. The shift Chemist has just arrived in the control room and has given you, the CRS, form 1000.042A to review.

TASK STANDARD: Examinee correctly recognizes that the threshold for Action Level 3 has been exceeded and the plant should be shutdown when value is exceeded for >2 hours.

TASK PERFORMANCE AIDS: OP-1000.042

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-NRC-ADMINCHEM1

Page 3 of 4

INITIATING CUE:

As Control Room Supervisor, review the 1000.042A form for out of specification Feedwater chlorides.

CRITICAL ELEMENTS (C) 4

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSA T
	1. Step 6.8.1 Directs SM to Compare results of confirmatory analyses to readings from continuous monitors.	Requested readings of continuous monitors to compare with lab analyses results on 1000.042A.	_____	_____	_____
NOTE: Inform trainee that continuous monitor readings correspond with all sample results if asked.					
	2. Step 6.8.3 Directs SM to Identify and isolate sources of impurity ingress.	Inquired as to results of searches for source of chloride in-leakage.	_____	_____	_____
NOTE: Inform trainee that Chemistry suspects a bad polisher to be the source of the chlorides if asked.					
	3. Refer to Attachment 9 1000.042.	Referred to Att. 9 to determine corrective actions. 1) Request routing of MSR drains to condenser. 2) Regenerate resins as required. 3) Identify and eliminate source using other sample points as necessary.	_____	_____	_____
(C)	4. Refer to Attachment 6 1000.042.	Referred to Att. 6 and determined that Action Level 2 as shown on the form is incorrect and that Action Level 3 had been exceeded. Action Level 3 requires the plant to be shutdown if the value has been exceeded for >2 hours (typically within six hours) instead of the 100 hours allowed for Action Level 2.	_____	_____	_____
	5. Inform Shift Manager that the unit is in a Chemistry Action Level 3 which requires the plant to be shutdown if the value is exceeded for >2 hours (typically within six hours)	CRS immediately contacts the SM and informs him that the unit is in a Chemistry Action Level 3 which requires the plant to be shutdown if the value is exceeded for >2 hours (typically within six hours)	_____	_____	_____

END

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- The plant had been operating at 100% for 215 days.
- The Shift Manager is at the morning meeting.
- The shift chemist has just arrived in the control room to inform the Shift Manager that Action Level 2 per Attachment 6 of OP 1000.042 has been entered.
- The shift chemist has given you, the CRS, form 1000.042A to review.

INITIATING CUE:

As Control Room Supervisor, review the 1000.042A form for out of specification Feedwater chlorides.

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE

**TITLE: STEAM GENERATOR WATER CHEMISTRY
MONITORING UNIT ONE**

DOCUMENT NO.
1000.042

CHANGE NO.
018

WORK PLAN EXP. DATE
N/A

SET #

SAFETY-RELATED
☒ YES ☐ NO

IPTE
☐ YES ☒ NO

TEMP MOD
☐ YES ☒ NO

LEVEL OF USE
☐ CONTINUOUS
☒ REFERENCE
☐ INFORMATIONAL

PROGRAMMATIC EXCLUSION PER EN-LI-100
☐ YES ☒ NO

When you see these TRAPS

Get these TOOLS

Time Pressure
Distraction/Interruption
Multiple Tasks
Overconfidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)

Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover

VERIFIED BY

DATE

TIME

FORM TITLE:

VERIFICATION COVER SHEET

FORM NO.
1000.006A

CHANGE NO.
054

EVENT DESCRIPTION High Chlorides in Feedwater A&B				OCCURRENCE DATE: 3/10/2010		TIME: 0840		REACTOR POWER: 100 %							
PLANT STATUS															
PRIOR TO OCCURRENCE															
COMPONENT OR SYSTEM AFFECTED															
DESCRIPTION OF CONDITION															
Chlorides >5 ppb															
PARAMETER		TEST RESULTS		LIMIT		PARAMETER		TEST RESULTS		LIMIT					
A FW Chlorides		11.8		<5		B FW Chlorides		13.4		<5					
ACTION RECOMMENDATIONS															
PROCEDURE REQUIREMENTS: 1000.042 page 4 of 32															
CHEMISTRY RECOMMENDATIONS: Return to below action level 2 within 100 hours															
MONITORING ACTIVITY															
SAMPLING FREQUENCY: Daily															
TIME CLOCK ENDS: Sunday															
CHEMIST REPORTING OUT OF SPEC: Gary Petri															
<input type="checkbox"/> Hideout Return for planned outage. If marked, then Shift Manager reviews may be N/A.															
REVIEWED BY															
SHIFT MANAGER:															
IN SPEC PARAMETER		TEST RESULTS		LIMIT		DATE TIME		IN SPEC PARAMETER		TEST RESULTS		LIMIT		DATE TIME	
CHEMIST VERIFYING															
IN SPEC. CONDITION:															
CORRECTIVE ACTION TAKEN BY OPERATIONS:															
REVIEWED BY:															
SHIFT MANAGER:															
DATE:															
TIME:															
FORM TITLE															
UNIT 1 STEAM GENERATOR MONITORING REPORT															
FORM NO. 1000.042A															
CHANGE 000-00-0															

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 4 of 32 CHANGE: 018
-------------------------------------	--	----------------------------------

3.2 COMMITMENTS

None

4.0 DEFINITIONS

- 4.1 ACTION LEVEL 1 (Objective: To promptly identify and correct the cause of an out-of-guideline value without power reduction) - Corrective actions shall be implemented as soon as possible to return the parameter to within Action Level 1. If a parameter has not been returned to below the Action Level 1 value within one week following confirmation of an excursion, an engineering evaluation shall be performed to justify continuing to operate above Action Level 1.
- 4.2 Action Level 2 (Objective: To promptly identify and correct the cause of an out-of-guideline value prior to shutdown) - Corrective actions shall be implemented as soon as possible to return the parameter to below Action Level 2. If the parameter is not below the Action Level 2 value within 100 hours following confirmation of the excursion, the plant shall be in the hot standby condition within an additional 24 hours. An engineering evaluation shall be performed to assess the cause of exceeding an Action Level 2 value, and corrective actions taken to minimize the occurrence of such excursions prior to returning to power operation.
- 4.3 Action Level 3 (Objective: to correct a condition which is expected to result in rapid corrosion during continued operation. Plant shutdown may be necessary to minimize impurity ingress and limit exposure of steam generator, turbine and other secondary system materials to corrosive solutions. Plant shutdown will also reduce further damage to the steam generator by allowing cleanup of impurities as a result of hideout return.) - If a control parameter exceeds the Action Level 3 value for greater than 2 hours, or if at any time a control parameter exceeds 20 ppb for any duration, then the plant shall be taken to hot or cold shutdown as quickly as safe plant operation permits (typically <6 hours) and clean up by feed and bleed or drain and refill as appropriate until normal values are reached. Progressing to cold shutdown generally will be advisable to allow flushing of the upper regions of the once through steam generators (OTSG).
- 4.4 CONTINUOUS - A frequency where analyzer is normally in service unless it is in disrepair or undergoing maintenance.
- 4.5 INTEGRATED SAMPLE CONCENTRATION -
- IF the composite samplers are in service,
THEN it is the concentration obtained by passing a known sample volume through special filters which are digested and analyzed later to calculate iron and copper concentrations in the bulk water.
- IF the composite samplers are undergoing corrective maintenance,
THEN it is the average concentration of all grab sample results collected during the sampling period for the applicable parameter.

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 5 of 32 CHANGE: 018
--	--	--

4.6 REACTOR MODES (as define by Unit 1 Technical Specifications):

Mode 1 (Power Operation) - Reactor critical ($K_{eff} \geq 0.99$) and rated thermal power $>5.0\%$.

Mode 2 (Startup) - Reactor critical ($K_{eff} \geq 0.99$) and rated thermal power $\leq 5.0\%$.

Mode 3 (Hot Standby) - Reactor not critical ($K_{eff} < 0.99$) with the average reactor coolant temperature (degrees F) ≥ 280 .

Mode 4 (Hot Shutdown) - Reactor not critical ($K_{eff} \leq 0.99$) with the average reactor coolant temperature (degrees F) > 200 but less than 280 and all reactor vessel head closure bolts fully tensioned.

Mode 5 (Cold Shutdown) - Reactor not critical ($K_{eff} < 0.99$) with the average reactor coolant temperature (degrees F) ≤ 200 and all reactor vessel head closure bolts fully tensioned.

Mode 6 (Refueling) - One or more reactor vessel head closure bolts less than fully tensioned.

4.7 SAMPLE SOURCES - Those points in the system from which a sample is drawn for analysis.

4.8 TREND - Chemistry data plotted versus time. Provides a rapid visual method of assessing plant chemistry.

5.0 RESPONSIBILITY AND AUTHORITY

5.1 GENERAL MANAGER, PLANT OPERATIONS

The General Manager, Plant Operations is responsible for overall implementation of this procedure.

5.2 SUPERINTENDENT, CHEMISTRY

The Superintendent, Chemistry is responsible for ensuring compliance with this procedure. The Superintendent, Chemistry or designee also determines if alternate sample locations are to be used when samples are not available in the Primary Sample Room due to insufficient motive force (temperature and pressure) during startup and shutdown evolutions. If a diagnostic parameter is listed without a stated sample frequency, the Superintendent, Chemistry or designee may determine a frequency to adequately assess the parameter's influence on system chemistry.

5.3 PLANT MANAGER, OPERATIONS; MANAGER, OPERATIONS; ANO-1/OPERATIONS STAFF

The Manager, Operations, ANO-1/Operations staff responsibilities include understanding the impact of chemistry conditions on major component performance, availability, and expected life; understanding the chemistry control program and the management support for the program; and establishment of corrective action priorities.

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 6 of 32 CHANGE: 018
-------------------------------------	--	----------------------------------

5.4 CHEMISTRY STAFF

The Chemistry staff responsibilities include understanding the goals for the program, implementation of the chemistry control program, timely and knowledgeable data review to identify unusual conditions quickly and evaluation to assess the underlying chemistry fundamentals, initiation of any required corrective actions, and making any necessary changes in the chemistry monitoring requirements to improve the chemistry control program.

5.5 MAINTENANCE STAFF

The Maintenance staff responsibilities include prompt and effective maintenance and repair of plant equipment required to maintain chemistry specifications.

5.6 PLANNING AND SCHEDULING PERSONNEL

The Planning and Scheduling personnel responsibilities include timely issuance of corrective maintenance required to maintain chemistry within specifications.

6.0 INSTRUCTIONS

6.1 A secondary chemistry monitoring program to maximize steam generator availability and operating life shall be carried out on the samples, parameters, and frequencies listed on Attachments 1 through 6 according to the status mode of the unit.

6.2 Sampling and analyses of the concerned parameters shall be performed using current approved procedures.

6.3 Analysis results shall be recorded on Form 1052.002A or in the Chemistry database.

6.4 Each parameter concerned with maximizing steam generator availability and operating life should be trended as a means of rapid visual assessment of plant chemistry.

6.5 Secondary Water Chemistry Reports shall be reviewed and compared to the normal parameter values listed on Attachments 1 through 6 according to the status mode and sample source.

6.6 IF an out-of-spec. condition is noted,
THEN request additional verification in the form of a confirmatory grab sample or obtain reading on another analyzer where possible within one hour of discovering the condition.

IF unusual conditions prevent resampling within one hour,
THEN a Nuclear Chemistry Supervisor should be notified and a resample planned as soon as possible. The time clock starts with the initial sample.

6.7 Out-of-spec. conditions shall be promptly reported to the Superintendent, Chemistry or a Nuclear Chemistry Supervisor and also to the Shift Manager. This notification shall be reported on Form 1000.042A.

IF the out of spec condition is due to hideout return during shutdown/cooldown for planned outages,
THEN the notification to the Shift Manager is not required.

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 7 of 32 CHANGE: 018
-------------------------------------	--	----------------------------------

- 6.8 The Superintendent, Chemistry; Nuclear Chemistry Supervisor and/or the Shift Manager shall proceed with a plan of corrective action to bring the parameter back into a normal value range. Typical corrective actions include:
- 6.8.1 Compare results of confirmatory analyses to readings from continuous monitors.
 - 6.8.2 Increase steam generator drain and fill for removal of specific impurities. (This can only be done during certain startup periods.)
 - 6.8.3 Identify and isolate sources of impurity ingress.
 - 6.8.4 Compare results of various analyses for internal consistency.
 - 6.8.5 Increase sample and analysis frequencies for short-term trending and confirmatory analyses of critical chemistry parameters where practical.
 - 6.8.6 Refer to Attachments 7, 8, and 9 for corrective actions of specific parameters.
- 6.9 All values from analyses and instrument readings should be archived for long-term trending and review.
- 6.10 It is intended that inline chemistry analyzers are the principle method of monitoring secondary chemistry. Grab samples should be used for verification of the accuracy of inline analyzers.
- 6.11 IF an inline analyzer that is required for continuous monitoring is out-of-service for maintenance, THEN a backup grab sample or portable meter reading should be obtained approximately every 6 hours. The grab sample can be omitted if the corresponding continuous analyzer on the opposite train is operable.
- 6.12 Test parameters that cannot be monitored because of laboratory equipment failures shall be evaluated for out-of-specification conditions by a Nuclear Chemistry Supervisor or designee. The determination shall be made by evaluating the data collected on other test parameters being monitored.
- 6.13 Outage maintenance plans should minimize the impact on the ability to recirculate and sample steam generators during periods of wet layup. Once steam generators are in wet layup and sample results indicate all parameters are within specifications, follow-up sample frequencies may be altered at the discretion of the Chemistry Superintendent or designee. This sample frequency change will only be allowed to accommodate maintenance windows.

NOTE

Step 6.14 does not apply to temporary loss of continuous monitoring for control parameters.

- 6.14 Deviation from control parameters in this procedure and/or the EPRI Guidelines require adequate technical justification. The technical justification shall meet the requirements listed in NMM EN-DC-317, "Entergy Steam Generator Administrative Procedure". A deviation requires completion of the appropriate attachment, "Industry Guideline Deviation Approval Sheet", located in NMM EN-DC-317.

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 8 of 32 CHANGE: 018
-------------------------------------	--	----------------------------------

- 6.15 If continuous monitoring is lost, place high priority on correcting problem. Collect grab samples every 6 hours if analyzers on both trains are inoperable and write a condition report.
- 6.16 The replacement steam generators have additional sample requirements imposed by the replacement vendor. Per the Technical Operation and Maintenance Manual (01-5070437-00) approved by AREVA and Entergy, EPRI secondary water chemistry control parameter requirements present and future must be adhered to in order to maintain warranty. Additionally, lead and copper are secondary diagnostic parameters with warranty implications. AREVA has provided additional parameters, frequencies, and suggested actions as recommendations. However, AREVA has requested notification of exceeded limits, deviated frequencies, and failures to monitor for all warranted and recommended items. Notification is to be performed within ninety days of each failure.
- 6.17 INPO CEI (Chemistry Effectiveness Indicator) limits are listed in Attachment 6. If any CEI limit is potentially impacted or exceeded, write a condition report and promptly notify the Unit 1 Shift Manager (or Control Room Supervisor), Chemistry Supervision and General Manager, Plant Operations (or designee).

7.0 ATTACHMENTS AND FORMS

7.1 ATTACHMENTS

- 7.1.1 Attachment 1, Modes 5 and 6 Cold Shutdown/Wet Layup (RCS $\leq 200^{\circ}\text{F}$)
- 7.1.2 Attachment 2, Mode 4 Hot Shutdown (RCS $>200^{\circ}\text{F}$ and $<280^{\circ}\text{F}$)
- 7.1.3 Attachment 3, Mode 3 Hot Standby (RCS $\geq 280^{\circ}\text{F}$, Reactor not Critical)
- 7.1.4 Attachment 4, Mode 2 Startup (Reactor Critical at $\leq 5\%$ Reactor Power)
- 7.1.5 Attachment 5, Mode 1 Power Operation (Reactor Power $>5\%$ and $<15\%$)
- 7.1.6 Attachment 6, Mode 1 Power Operation (Reactor Power $\geq 15\%$)
- 7.1.7 Attachment 7, Cold Shutdown/Wet Layup Corrective Actions
- 7.1.8 Attachment 8, Hot Shutdown, Hot Standby, Startup, and Reactor Critical at $<15\%$ Reactor Power Corrective Actions
- 7.1.9 Attachment 9, Mode 1 Power Operation ($\geq 15\%$ Reactor Power) Corrective Actions

7.2 FORMS

- 7.2.1 Form 1000.042A, Unit 1 Steam Generator Monitoring Report (electronic form)

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 23 of 32 CHANGE: 018
--	--	---

ATTACHMENT 6

Page 1 of 5

MODE 1
POWER OPERATION
(REACTOR POWER $\geq 15\%$)

Feedwater
Control Parameters

Parameter	Frequency (A)	Action Levels			CEI Limits (0)
		1	2	3	

NOTE

The morpholine band listed below implements resolution of CR C-2008-01324 (CA 9)

Morpholine, ppm	Daily	25-75 (B)			
Hydrazine, ppb	Continuous	$\leq 5 \times \text{CPD}[\text{O}_2]$ or <20 ppb (I)	(I)	(I)	
Sodium, ppb	Continuous (C)	1	3	5 (L)	0.3
Chlorides, ppb	Daily (C)	3	5	10 (L)	3
Sulfates, ppb	Daily	1	3	5 (L)	1
Silica, ppb (M)	Weekly	10	20		
Total Iron, ppb	Weekly (D)	5			5
Oxygen, ppb	Continuous (E)	5	10		5

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 24 of 32 CHANGE: 018
--	--	---

ATTACHMENT 6

Page 2 of 5

MODE 1
POWER OPERATION
(REACTOR POWER \geq 15%)

Feedwater
Diagnostic Parameters (D)

	Frequency	Normal Value	Initiate Action	CEI Limit (O)
Cation Conductivity, umhos/cm (N)	Daily	≤ 0.2 (J)	(K)	

NOTE

The requirement to analyze acetate and formate is resolution of CR-ANO-C-2008-01324, CA 20.

Acetate/Formate	Analyze to resolve cation conductivity observations.			
Fluoride	Fluoride transport assessment, resolution of cat. cond. observ.			
Copper, ppb (F)	Weekly	≤ 1.0 (J)	> 1.0 (J)	1.0
Lead*, ppb	Weekly	≤ 0.05 (J)	> 0.05 (J)	
Magnetite Fraction (on demand)				

Integrated Corrosion Product Transport - Assessment of corrosion product mass transport to steam generators using integrated samples. (on demand)

*Lead transport assessment per EPRI (on demand)

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 25 of 32 CHANGE: 018
--	--	---

ATTACHMENT 6

Page 3 of 5

MODE 1
POWER OPERATION
(REACTOR POWER \geq 15%)

Parameter	Frequency	Initiate Action
-----------	-----------	-----------------

Condensate Pump Discharge Sample (G)

Diagnostic Parameter

Dissolved Oxygen, ppb	Continuous	>25
-----------------------	------------	-----

Action Levels

1	2	3
---	---	---

Control Parameter

Dissolved Oxygen, ppb (E)	Continuous	>10
---------------------------	------------	-----

Moisture Separator Drain Samples

Diagnostic Parameters

Sodium, ppb

Chloride, ppb

Sulfate, ppb

Organic acids, ppb Demonstrate consistency with cation conductivity.

Cation Conductivity, μ mho/cm

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 26 of 32 CHANGE: 018
-------------------------------------	--	-----------------------------------

ATTACHMENT 6
MODE 1
POWER OPERATION
(REACTOR POWER $\geq 15\%$)

Page 4 of 5

- (A) No planned maintenance should be allowed that will result in a loss of sample (which would prevent meeting sample frequencies) for more than twenty-four (24) hours. During the maintenance period, grab samples (if sampling capability exists) should be collected every six (6) hours for the applicable samples. Grab samples may be taken from the corrosion product samplers or other final feedwater location if cooling is available, to satisfy the sampling requirements. Maintenance requiring the system to be down for more than twenty-four (24) hours should be scheduled to be performed during outages. If unexpected conditions require sample cooling to be unavailable for more than twenty-four (24) hours, alternate sample cooling capability should be obtained (temporary modification or procedurally allowed jumper) or alternate sampling should be evaluated by Chemistry management.
- (B) Daily determination of morpholine may be by calculation using specific conductivity. Actual measurement should be at least weekly.
- (C) Final feedwater concentrations may be calculated from moisture separator drain concentrations using a mass balance approach. Divide MSR values for sodium and chloride by 16. This approach cannot be used for sulfate since sulfate has a high portion of hideout in the steam generator.
- (D) This limit applies to steady state operation after a stabilization period, usually 1 week. Integrated sampling should be initiated at approximately 30% power after startup or as directed by Chemistry management.
- (E) Feedwater oxygen values are normally taken from the inline analyzers. If the inline analyzer is out of service, grab samples must be taken. Do not sample for feedwater oxygen at the sample room. If feedwater cannot be sampled on either feedwater train locally either by analyzer or grab sample, then condensate oxygen becomes a control parameter. Notify Operations to perform instructions in OP-1106.029 when condensate oxygen exceeds 10 ppb.
- (F) Copper analysis is used to trend and establish a baseline value per EPRI guidelines. Steam generator replacement vendor (AREVA) recommends limit and the associated action to identify and eliminate source if limit is exceeded.
- (G) Condensate pump oxygen is considered a diagnostic parameter when using localized feedwater oxygen sampling. Plant power reduction is not required based on condensate pump oxygen if localized feedwater oxygen sampling is utilized. Normally, the local feedwater oxygen analyzer is used or if analyzer is out of service, use grab samples locally. If condensate oxygen as a diagnostic parameter is greater than 25 ppb, steps should be taken to reduce condensate oxygen to avoid excessive amounts of hydrazine in feedwater.
- (H) If condensate oxygen is used as a control parameter, reduce power to 50-60% and determine source of inleakage.

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 27 of 32 CHANGE: 018
-------------------------------------	--	-----------------------------------

Page 5 of 5

ATTACHMENT 6

MODE 1 POWER OPERATION (REACTOR POWER \geq 15%)

- (I) If the ratio of feedwater hydrazine to feedwater oxygen decreases to <2 and is not restored to ≥ 2 within 8 hours, commence shutdown as quickly as safe operation permits. If hydrazine feed is restored, the plant may be returned to full power.
- (J) This parameter or limit is a steam generator replacement vendor (AREVA) recommendation and is not required by EPRI. If a limit is exceeded, a notification along with corrective actions taken should be forwarded to AREVA within ninety (90) days.
- (K) The steam generator replacement vendor (AREVA) recommends the following corrective actions in the event the following calculated cation conductivity (based on strong acid anion contributions) limits are exceeded.
 - 1. IF value exceeds 0.2 umhos/cm,
 THEN return to normal value within twenty-four (24) hours
 AND immediately check chloride and sulfate.
 - 2. IF value exceeds 1.0 umhos/cm,
 THEN return to normal value within eight (8) hours
 AND immediately check chloride and sulfate.
 - 3. IF value exceeds 2.0 umhos/cm,
 THEN return to normal value within two (2) hours
 AND immediately check chloride and sulfate.
- (L) Plant shutdown required only if Action Level 3 value is exceeded for >2 hours, or if at any time for any deviation that exceeds 20 ppb.
- (M) Parameter included for turbine performance. Silica is not considered to impact steam generator integrity and is therefore a recommended parameter outside of NEI 97-06 requirements.
- (N) Calculated value based on strong anion contributions.
- (O) INPO CEI limits are applicable at greater than 30% power. If any CEI limit is potentially impacted or exceeded, write a condition report and promptly notify the Unit 1 Shift Manager (or Control Room Supervisor), Chemistry Supervision and General Manager, Plant Operations (or designee).

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 31 of 32 CHANGE: 018
--	--	---

ATTACHMENT 9

Page 1 of 2

POWER OPERATION ($\geq 15\%$ REACTOR POWER) CORRECTIVE ACTIONS

Final Feedwater Sample

Parameter Out of Range

Corrective Action

pH	<ol style="list-style-type: none"> 1. Verify correct hydrazine feed. 2. Verify correct morpholine feed. 3. Verify absence of regenerant chemical inleakage.
Morpholine/Hydrazine	<ol style="list-style-type: none"> 1. Adjust chemical addition.
Dissolved Oxygen CPD[O ₂].	<ol style="list-style-type: none"> 1. Check hydrazine residual; adjust to ≥ 8 x 2. Identify and reduce sources of air inleakage. 3. Check for decreasing condenser vacuum.
Chloride/Silica/ Sodium/Sulfate	<ol style="list-style-type: none"> 1. Request routing of MSR drains to condenser. 2. Regenerate resins as required. 3. Identify and eliminate source using other sample points as necessary. 4. Investigate for possible internal source of contamination. 5. Consider hot soaks following shutdown due to chemistry excursion.
Iron	<ol style="list-style-type: none"> 1. Assure morpholine, pH and oxygen are in specification. 2. Increase pH/morpholine to maximum value allowed within control range.

PROC./WORK PLAN NO. 1000.042	PROCEDURE/WORK PLAN TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING UNIT ONE	PAGE: 32 of 32 CHANGE: 018
---------------------------------	--	-------------------------------

ATTACHMENT 9

Page 2 of 2

POWER OPERATION ($\geq 15\%$ REACTOR POWER) CORRECTIVE ACTIONS

NOTE

This corrective action for cation conductivity implements resolution to CR C-2008-01324 (CA-20)

Final Feedwater (cont)

Cation Conductivity 1. Analyze for organic acids.

Condensate Pump Discharge Sample

Parameter Out of Range

Corrective Action

Dissolved Oxygen	1. Identify and reduce air inleakage sources.
	2. <u>IF</u> available, <u>THEN</u> test other available locations in feedwater train for dissolved oxygen.
	3. Check for decreasing condenser vacuum.
	4. Evaluate condenser oxygen removal efficiency.

NOTE

Step 5 implements resolution of CR ANO-1-2008-02708 (CA-6).

5. Contact Operations to perform instructions in OP-1106.029 when condensate oxygen exceeds 10 ppb.

SRO ADMIN JPM

A3. EQUIPMENT CONTROL

A1JPM-NRC-ADMINSURV6

ADMINISTRATIVE JOB PERFORMANCE MEASUREUNIT: 1 REV # 1 DATE: _____TUOI NUMBER: A1JPM-NRC-ADMINSURV6SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – EQUIPMENT CONTROLTASK: Identify Errors in a completed surveillanceJTA#: ANO1-SRO-ADMIN-SURV-15KA VALUE RO: 3.7 SRO: 4.1 KA REFERENCE: 2.2.12APPROVED FOR ADMINISTRATION TO: RO: _____ SRO: XTASK LOCATION: INSIDE CR: _____ OUTSIDE CR: _____ BOTH: X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: _____ CLASSROOM: XPOSITION EVALUATED: RO: _____ SRO: XACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: _____ CR: XTESTING METHOD: SIMULATE: _____ PERFORM: XAPPROXIMATE COMPLETION TIME IN MINUTES: 15 MINUTESREFERENCE(S): OP-1104.005

EXAMINEE'S NAME: _____ SSN _____ - _____ - _____

EVALUATOR'S NAME: _____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS
CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____ UNSATISFACTORY: _____

PERFORMANCE CHECKLIST COMMENTS:

_____ Start Time _____ Stop Time _____ Total Time

SIGNED _____ DATE: _____

SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY A
QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS: The plant is at 100% power and the quarterly surveillance for P-35A has been completed per OP-1104.005 Supplement 3.

TASK STANDARD: The examinee has identified 4 of the 6 errors and has declared the Spray Pump Inoperable due to not meeting operability requirements of the surveillance. And complete section 4

TASK PERFORMANCE AIDS: Completed portion of OP-1104.005 Supplement 3.

ADMINISTRATIVE JOB PERFORMANCE MEASURE**INITIATING CUE:**

The SM directs you to perform Section 4, of 1104.005 Supplement 3 on "A" Reactor Building Spray Pump surveillance.

CRITICAL ELEMENTS (C): 3, 4, 5, 7, and 8

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Perform review of the surveillance procedure results.	Reviews the surveillance procedure provided.	_____	_____	_____
	2. Discover errors and omissions Stop Watch is out of calibration date. Omitted check mark for VUC-1B unit running. O.B. Pump Brg Vib Horizontal should be circled as NO.	1) Identified that Stop Watch is out of calibration date. 2) Check mark for VUC-1B unit running. NO has been circled instead of YES	_____	_____	_____
(C)	3. Discover errors Pump D/P @ 1175 gpm is out of LIMITING RANGE FOR OPERABILITY range. Pump D/P @ 1175 should be circled as NO. O.B. Pump Brg Vib Horizontal Measure Value is out of the LIMITING RANGE FOR OPERABILITY range.	1) Identified that Pump D/P @ 1175 gpm is out of LIMITING RANGE FOR OPERABILITY range. 2) NO has been circled instead of YES. 3) Identified that O.B. Pump Brg Vib Horizontal Measure Value is out of the LIMITING RANGE FOR OPERABILITY range. 4) NO has been circled instead of YES	_____	_____	_____
(C)	4. Step 4.1.	Step 4.1 should be circled NO.	_____	_____	_____
(C)	5. Step 4.2.	Step 4.2 should be circled NO.	_____	_____	_____
	6. Step 4.3.	Step 4.3 should be circled Yes.	_____	_____	_____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

(C)	<p>7. Step 4.4. Declare P35A inoperable Initiate Condition Report</p> <p>AND at least one of the following</p> <p>Initiate corrective actions Reference Tech Spec LCO</p>	<p>Step 4.4 should be have the following listed in the describe section.</p> <p>Declare P35A inoperable Initiate Condition Report Initiate corrective actions Reference Tech Spec LCO</p>	_____	_____	_____
(C)	8. Step 4.5.	Step 4.5 should be circled NO.	_____	_____	_____
	9. Step 4.6.	Step 4.6 should be circled NO.	_____	_____	_____

END

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 87 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

Page 12 of 18

3.1 Compare results/measured values recorded during P-35A testing with "Acceptable Normal Range" and "Limiting Range for Operability".

Stopwatch M&TE No. DES-017 Cal Due Date 3/5/2010 (1)

TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
VUC-1A	N/A	(✓) if unit Runs (✓)	N/A	Unit Runs	(1) (Yes) No
VUC-1B	N/A	(✓) if unit Runs (✓)	N/A	Unit Runs	(1) (Yes) No
VUC-1A or VUC-1B	N/A	N/A (2)	N/A	1 of 2 Operable	(Yes) No

Note 1 IF "NO" is circled, THEN declare component inoperable, write a Condition Report, immediately notify the Shift Manager and initiate corrective action. It is not necessary to write a Condition Report for a failure which is already specifically addressed by an open CR, or for a fan out of service for planned maintenance.

TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
Idle Suct Press	SPDS/Alt Test Inst	33.9 psig	> 5 psig	N/A	N/A

Valve	Control Panel	Test Direction	Local Verification (Init.)	Measured Stroke Time (nearest 1/10 sec.)	Acceptable Normal Range (sec.)	Limiting Value For Operability (sec.)	Is Measured Stroke Time Less Than "Limiting Value For Operability"?	Design Bases Value
CV-3804	C19	Open	N/A	2.1	1.2 to 3.6	4.8 (2)	Yes No	N/A
Note 2 Valve stroke time \leq limiting value verifies proper fail safe operation.								

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 88 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

Page 13 of 18

TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
Running Suct Press @~1500 gpm	SPDS/Alt Test Inst	32.9 psig	> 5 psig	N/A	N/A
Discharge Press. @~1500 gpm	SPDS/Alt Test Inst	223 psig	N/A	N/A	N/A
Pump ΔP @~1500 gpm	Disch Press - Running Suct Press	190.1 psid	181.4 to 200.8 psid	175.5 to 200.8 psid	Yes No
Disch Flow	SPDS/Alt Test Inst	1512 gpm	N/A	1500 to 1520 gpm	Yes No
Disch Flow	FIS-2401	1520 gpm	N/A	N/A	N/A
Disch Flow	FIRS-1500	1500 gpm	N/A	N/A	N/A
Motor Running Current	A-304 Ammeter	A Ø 47 amp B Ø 50 amp C Ø 48 amp	N/A	N/A	N/A
Motor Stator Temp	T2440 PMS	°F	N/A	<311°F	Yes N/A No

Valve	Test Direction	Local Verification (Init.)	Measured Stroke	Acceptable Normal Range	Limiting Range For Operability	Is Data Within Limiting Range?	Design Bases Value
BW-6A	Open	N/A	(3) (✓) if valve stroke Sat (✓)	N/A	Valve Stroke Sat	Yes No	N/A

Note 3 Full Stroke is satisfactory when design flow is established.

KEY

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 89 of 142 CHANGE: 056
--	--	--

SUPPLEMENT 3

Page 14 of 18

3.0 ACCEPTANCE CRITERIA (continued)

Table 6					
TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
IB Pump Brg. Temp	TE-2443 PMS T2443	N/A °F	< 160°F	< 180°F	Yes <u>N/A</u> No
OB Pump Brg. Temp	TE-2444 PMS T2444	N/A °F	< 160°F	< 180°F	Yes <u>N/A</u> No
IB Motor (PP End) Brg. Temp	TE-2442 PMS T2442	N/A °F	N/A	N/A	<u>N/A</u>
OB Motor (MTR End) Brg. Temp	TE-2441 PMS T2441	N/A °F	N/A	N/A	<u>N/A</u>

Table 7					
TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
Running Suct Press @~1175 gpm	SPDS/Alt Test Inst	33.5 psig	> 5 psig	N/A	N/A
Discharge Press. @~1175 gpm	SPDS/Alt Test Inst	256 psig	N/A	N/A	N/A
Pump ΔP @~1175 gpm	Disch Press - Running Suct Press	202.5 psid ⁽³⁾	200.3 to 221.7 psid	193.8 to 221.7 psid	<u>Yes</u> <u>No</u> ⁽⁴⁾
Disch Flow	SPDS/Alt Test Inst	1172 gpm	N/A	1165 to 1185 gpm	N/A

KEY

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 90 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 15 of 18

3.0 ACCEPTANCE CRITERIA (continued)

NOTE

Collect vibration data at a flow rate of 1500-1520 gpm.

Table 8

TEST QUANTITY	INSTRUMENT	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
O.B. Motor Brg Vib (4) (1)	Vibrometer	0.105 IN/SEC	N/A	N/A	N/A
I.B. Motor Brg Vib (4) (2)	Vibrometer	0.113 IN/SEC	N/A	N/A	N/A
I.B. Pump Brg Vib Vertical (4) (3)	Vibrometer	0.320 IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	Yes No
I.B. Pump Brg Vib Horizontal (4) (4)	Vibrometer	0.250 IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	Yes No
O.B. Pump Brg Vib Vertical (4) (5)	Vibrometer	0.189 IN/SEC	≤ 0.293 IN/SEC	≤ 0.7 IN/SEC	Yes No
O.B. Pump Brg Vib Horizontal (4) (6)	Vibrometer	0.810 IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	Yes No ⁵
O.B. Pump Brg Vib Axial (4) (7)	Vibrometer	0.170 IN/SEC	≤ 0.295 IN/SEC	≤ 0.7 IN/SEC	Yes No
Note 4 See attached drawing.					

KEY

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 91 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 16 of 18

3.0 ACCEPTANCE CRITERIA (continued)

3.2 IF "NO" is circled in the right-hand column for any component other than a Note 1 component, THEN perform the following:

- Declare P-35A inoperable.
- Verify Condition Report initiated.
- Immediately notify the Shift Manager.
- Initiate corrective action.
- Reference applicable Tech Spec LCO Condition for Required Actions.

3.3 IF any measured values do not satisfy the "Acceptable Normal Range", THEN initiate corrective action.

3.4 Stroke Criteria

3.4.1 Compare measured values/stroke times with "Acceptable Normal Range" and "Limiting Value For Operability".

3.4.2 IF "No" is circled in any Table 3 or 5 space, THEN perform the following:

- Declare that valve inoperable.
- Verify Condition Report initiated.
- Immediately notify the Shift Manager.
- Initiate corrective action.
- Reference applicable Tech Spec LCO Condition for Required Actions.
- IF practical, THEN fail the valve in its ES position.

3.4.3 IF any measured stroke time does not fall within the "Acceptable Normal Range", THEN immediately retest valve or declare that valve inoperable. Refer to "Operability" section of this procedure for additional guidance.

Performed By

Blt Pje

713

Operator

Date/Time

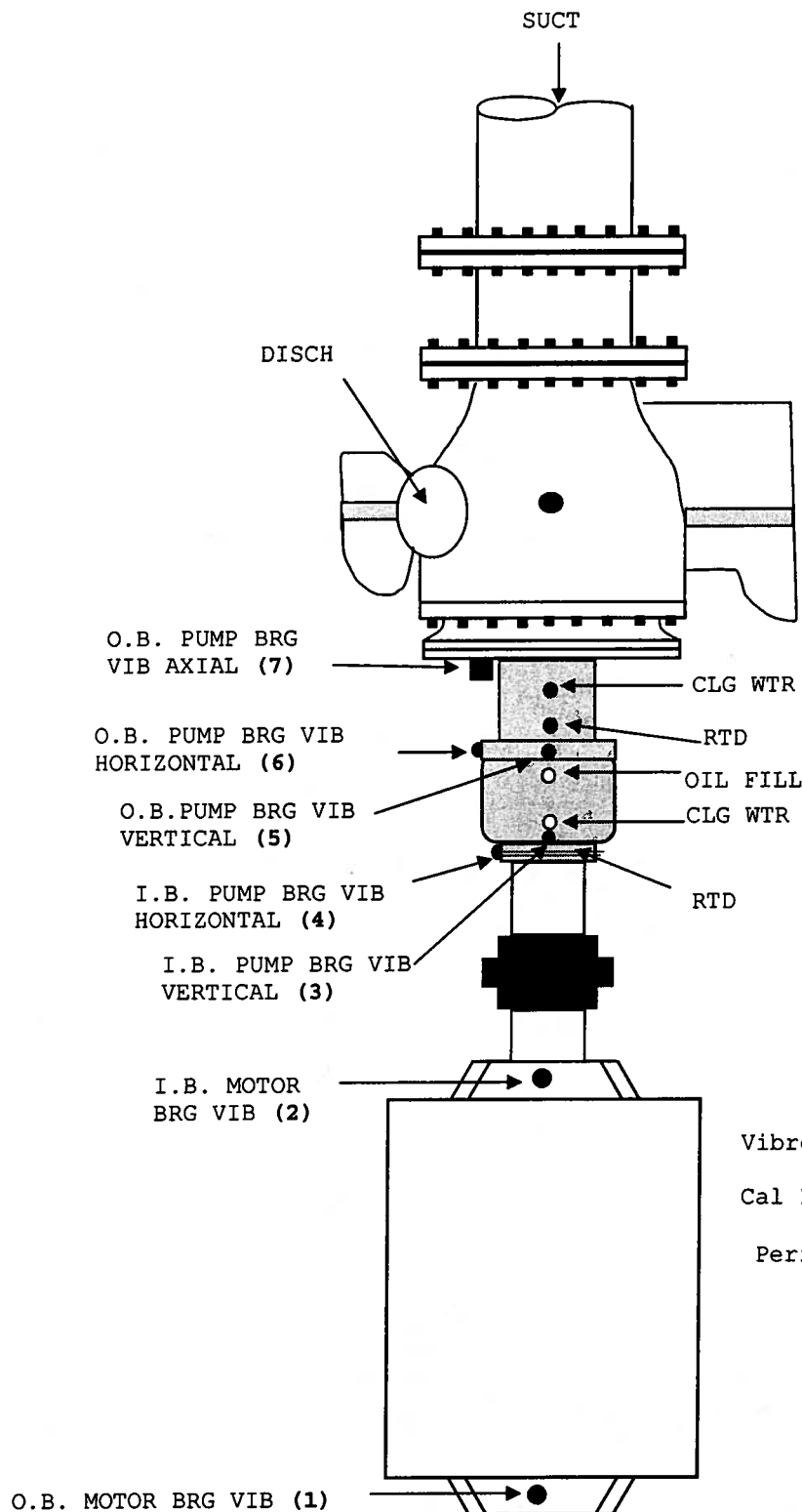
3/12/2010/0240

KEY

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 92 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 17 of 18



POINT NO.	VELOCITY (IN/SEC)
1	0.105
2	0.115
3	0.320
4	0.250
5	0.189
6	0.810
7	0.170

Vibrometer No. DVA-011
 Cal Due Date 6/30/2010
 Performed by Bob Page 713

Hold vibrometer probe tip firmly against the survey point marker, perpendicular to the surface.

KEY

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 93 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 18 of 18

4.0 SHIFT MANAGER REVIEW AND ANALYSIS

(circle one)

- 4.1 Do all measured values/stroke times recorded in the Acceptance Criteria section fall within/less than the specified "Limiting Range/Value For Operability"? YES ☒ NO
- 4.2 Do all measured values recorded in the Acceptance Criteria section fall within the "Acceptable Normal Range"? YES ☒ NO
- 4.2.1 IF "NO" and issue is pump related,
THEN initiate corrective action and double the test frequency until resolved satisfactorily.
- 4.3 Do all measured valve stroke times recorded in Acceptance Criteria section fall within the "Acceptable Normal Range"? ☒ YES NO
- 4.3.1 IF "NO",
THEN immediately retest valve or declare that valve inoperable. Refer to "Operability" section of this procedure for additional guidance. Initiate corrective action.
- 4.4 IF answer to either 4.1, 4.2, or 4.3 is "NO",
THEN describe the action taken below.
- Declared P35A inoperable
Initiate condition report
Initiate corrective actions
Reference Tech Spec LCO
- 4.5 Has this equipment been proven operable per the ACCEPTANCE CRITERIA? YES ☒ NO
- 4.6 Have all of the administrative requirements of this test been satisfied (i.e., all initial blocks initialed or N/A'd, all data entered, cal due dates listed, applicable signature spaces signed, etc.)? YES ☒ NO

SHIFT MANAGER _____ DATE _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

**The plant is operating at 100% power.
P-35A Quarterly surveillance has been completed
per OP-1104.005 Supplement 3.**

INITIATING CUE:

**The SM directs you to perform Section 4, of 1104.005
Supplement 3 on "A" Reactor Building Spray Pump
surveillance.**

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 89 of 142 CHANGE: 056
--	--	--

SUPPLEMENT 3

Page 14 of 18

3.0 ACCEPTANCE CRITERIA (continued)

Table 6					
TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
IB Pump Brg. Temp	TE-2443 PMS T2443	N/A °F	< 160°F	< 180°F	Yes <u>N/A</u> No
OB Pump Brg. Temp	TE-2444 PMS T2444	N/A °F	< 160°F	< 180°F	Yes <u>N/A</u> No
IB Motor (PP End) Brg. Temp	TE-2442 PMS T2442	N/A °F	N/A	N/A	<u>N/A</u>
OB Motor (MTR End) Brg. Temp	TE-2441 PMS T2441	N/A °F	N/A	N/A	<u>N/A</u>

Table 7					
TEST QUANTITY	INSTRUMENT (Circle Inst Used)	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
Running Suct Press @~1175 gpm	SPDS/Alt Test Inst	33.5 psig	> 5 psig	N/A	N/A
Discharge Press. @~1175 gpm	SPDS/Alt Test Inst	256 psig	N/A	N/A	N/A
Pump ΔP @~1175 gpm	Disch Press - Running Suct Press	202.5 psid	200.3 to 221.7 psid	193.8 to 221.7 psid	<u>Yes</u> No
Disch Flow	SPDS/Alt Test Inst	1172 gpm	N/A	1165 to 1185 gpm	N/A

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 90 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 15 of 18

3.0 ACCEPTANCE CRITERIA (continued)

NOTE
Collect vibration data at a flow rate of 1500-1520 gpm.

Table 8					
TEST QUANTITY	INSTRUMENT	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (Circle Yes or No)
O.B. Motor Brg Vib (4) (1)	Vibrometer	0.105 IN/SEC	N/A	N/A	N/A
I.B. Motor Brg Vib (4) (2)	Vibrometer	0.113 IN/SEC	N/A	N/A	N/A
I.B. Pump Brg Vib Vertical (4) (3)	Vibrometer	0.320 IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	Yes No
I.B. Pump Brg Vib Horizontal (4) (4)	Vibrometer	0.250 IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	Yes No
O.B. Pump Brg Vib Vertical (4) (5)	Vibrometer	0.189 IN/SEC	≤ 0.293 IN/SEC	≤ 0.7 IN/SEC	Yes No
O.B. Pump Brg Vib Horizontal (4) (6)	Vibrometer	0.810 IN/SEC	≤ 0.325 IN/SEC	≤ 0.7 IN/SEC	Yes No
O.B. Pump Brg Vib Axial (4) (7)	Vibrometer	0.170 IN/SEC	≤ 0.295 IN/SEC	≤ 0.7 IN/SEC	Yes No
Note 4 See attached drawing.					

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 91 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 16 of 18

3.0 ACCEPTANCE CRITERIA (continued)

3.2 IF "NO" is circled in the right-hand column for any component other than a Note 1 component, THEN perform the following:

- Declare P-35A inoperable.
- Verify Condition Report initiated.
- Immediately notify the Shift Manager.
- Initiate corrective action.
- Reference applicable Tech Spec LCO Condition for Required Actions.

3.3 IF any measured values do not satisfy the "Acceptable Normal Range", THEN initiate corrective action.

3.4 Stroke Criteria

3.4.1 Compare measured values/stroke times with "Acceptable Normal Range" and "Limiting Value For Operability".

3.4.2 IF "No" is circled in any Table 3 or 5 space, THEN perform the following:

- Declare that valve inoperable.
- Verify Condition Report initiated.
- Immediately notify the Shift Manager.
- Initiate corrective action.
- Reference applicable Tech Spec LCO Condition for Required Actions.
- IF practical, THEN fail the valve in its ES position.

3.4.3 IF any measured stroke time does not fall within the "Acceptable Normal Range", THEN immediately retest valve or declare that valve inoperable. Refer to "Operability" section of this procedure for additional guidance.

Performed By

Belt Page 713

Operator

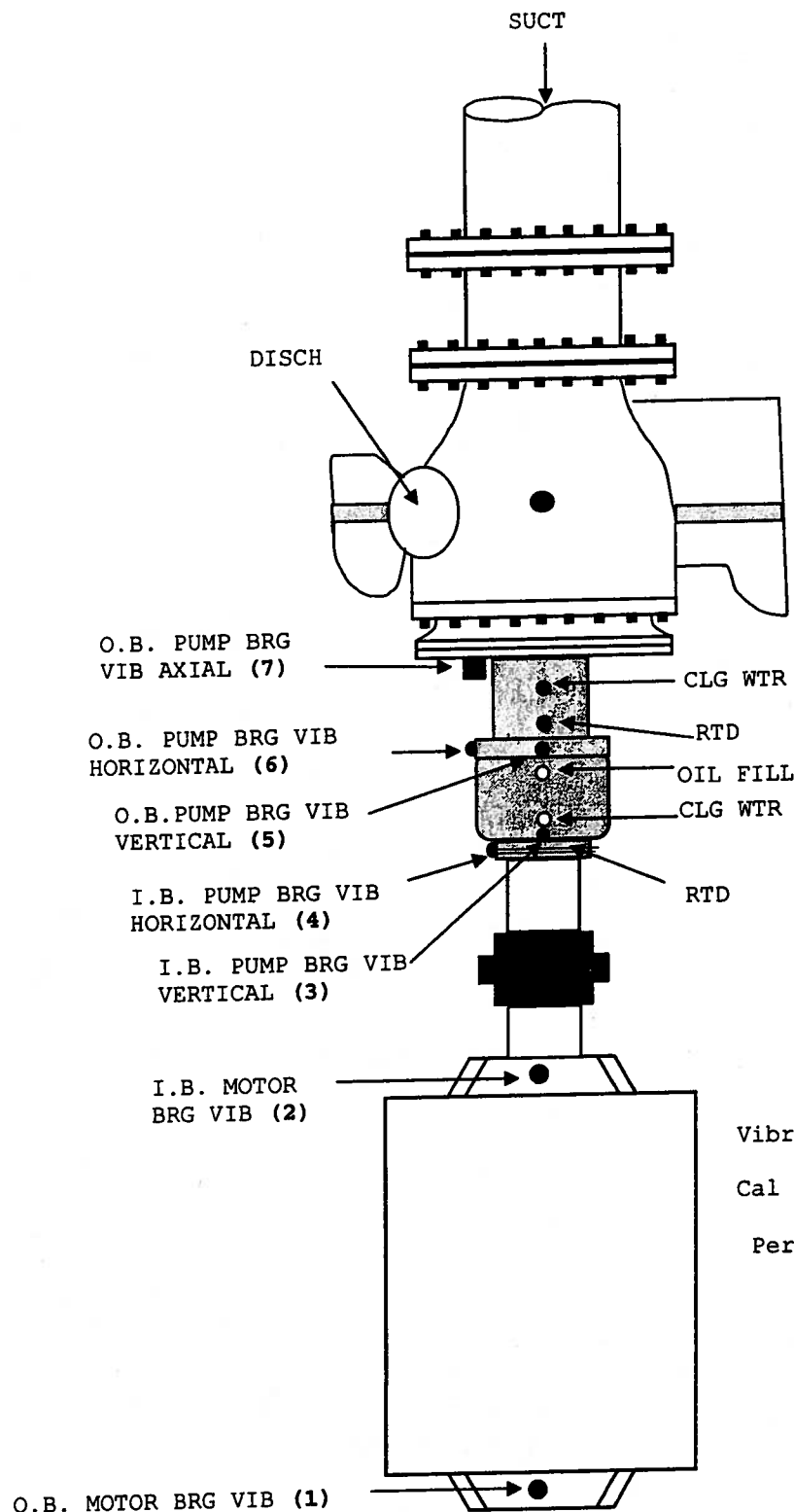
Date/Time

3/12/2010/0240

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 92 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 17 of 18



POINT NO.	VELOCITY (IN/SEC)
1	0.105
2	0.115
3	0.320
4	0.250
5	0.189
6	0.810
7	0.170

Vibrometer No. DVA-011

Cal Due Date 6/30/2010

Performed by Rlt Page 713

Hold vibrometer probe tip firmly against the survey point marker, perpendicular to the surface.

PROC./WORK PLAN NO. 1104.005	PROCEDURE/WORK PLAN TITLE: REACTOR BUILDING SPRAY SYSTEM OPERATION	PAGE: 93 of 142 CHANGE: 056
---------------------------------	---	--------------------------------

SUPPLEMENT 3

Page 18 of 18

4.0 SHIFT MANAGER REVIEW AND ANALYSIS

(circle one)

4.1 Do all measured values/stroke times recorded in the Acceptance Criteria section fall within/less than the specified "Limiting Range/Value For Operability"? YES NO

4.2 Do all measured values recorded in the Acceptance Criteria section fall within the "Acceptable Normal Range"? YES NO

4.2.1 IF "NO" and issue is pump related,
THEN initiate corrective action and double the test frequency until resolved satisfactorily.

4.3 Do all measured valve stroke times recorded in Acceptance Criteria section fall within the "Acceptable Normal Range"? YES NO

4.3.1 IF "NO",
THEN immediately retest valve or declare that valve inoperable. Refer to "Operability" section of this procedure for additional guidance. Initiate corrective action.

4.4 IF answer to either 4.1, 4.2, or 4.3 is "NO",
THEN describe the action taken below.

4.5 Has this equipment been proven operable per the ACCEPTANCE CRITERIA? YES NO

4.6 Have all of the administrative requirements of this test been satisfied (i.e., all initial blocks initialed or N/A'd, all data entered, cal due dates listed, applicable signature spaces signed, etc.)? YES NO

SHIFT MANAGER _____ DATE _____

SRO ADMIN JPM

A4. RADIATION CONTROL

A1JPM-NRC-ADMINRWP1

ADMINISTRATIVE JOB PERFORMANCE MEASUREUNIT: 1 REV # 1 DATE: _____TUOI NUMBER: A1JPM-NRC-ADMINRWP1SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – Radiation ControlTASK: Ability to comply with radiation work permit requirementsJTA#: ANO1-RO-MUP-NORM-13KA VALUE RO: 3.5 SRO: 3.6 KA REFERENCE: 2.3.7APPROVED FOR ADMINISTRATION TO: RO: X SRO: XTASK LOCATION: INSIDE CR: X OUTSIDE CR: _____ BOTH: _____

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: _____ Classroom: XPOSITION EVALUATED: RO: X SRO: XACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: _____ Classroom: XTESTING METHOD: SIMULATE: _____ PERFORM: XAPPROXIMATE COMPLETION TIME IN MINUTES: 10 MINUTESREFERENCE(S): RWP 20101002

EXAMINEE'S NAME: _____ SSN _____ - _____ - _____

EVALUATOR'S NAME: _____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS
CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____ UNSATISFACTORY: _____

PERFORMANCE CHECKLIST COMMENTS:

_____ Start Time _____ Stop Time _____ Total Time

SIGNED _____ DATE: _____

SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY A
QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

INITIAL PLANT CONDITIONS

- 100% power steady state.
- Maintenance requires your assistance in the lower T-36 Valve Gallery.
- Your total dose for the year is currently 1950 mR.
- The dose rate in the area is 105 mR/hr.

TASK STANDARD:

Use the attached RWP, 2010-1002 Task 1.

Using the above information determine your MAXIMUM stay time in the lower valve gallery.

TASK PERFORMANCE AIDS: RWP 20101002

SIMULATOR SETUP: NA

ADMINISTRATIVE JOB PERFORMANCE MEASURE**INITIATING CUE:**

Use the attached RWP, 2010-1002 Task 1.

Using the above information determine your **MAXIMUM** stay time in the lower valve gallery.

CRITICAL ELEMENTS (C): 2 and 4

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Recognize the dose limit per the RWP is 20 mR.	Examinee identifies that the RWP Dose Alarm is set at 20 mR Student may also identify that the Dose Rate Alarm is set at 200 mR/hr.	_____	_____	_____
(C)	2. Determine stay time based on the given dose in the area not to exceed RWP limit of 20 mR.. $\frac{20 \text{ mR}}{105 \text{ mR/hr}} \times \frac{60 \text{ min}}{1 \text{ hr}} = 11.4 \text{ minutes}$	Examinee determines that the RWP Dose Alarm limit is set at 20 mR which would allow him to stay 11.4 minutes. Student may also identify that the Dose Rate Alarm is set at 200 mR/hr.	_____	_____	_____
	3. Determine stay time based on the given dose in the area not to exceed annual dose limits. $\frac{50 \text{ mR}}{105 \text{ mR/hr}} \times \frac{60 \text{ min}}{1 \text{ hr}} = 28.5 \text{ minutes}$	Examinee determines stay time based on Annual Dose Limit of 2000 mR would allow him to stay for 28.5 minutes.	_____	_____	_____
(C)	4. Determine maximum stay time based on the given dose in the area.	Examinee identifies that the RWP Dose Alarm is the most limiting and the MAXIMUM stay time is 11.4 minutes.	_____	_____	_____

END

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- **100% power steady state.**
- **Maintenance requires your assistance in the lower T-36 Valve Gallery.**
- **Your total dose for the year is currently 1950 mR.**
- **The dose rate in the area is 105 mR/hr**

INITIATING CUE:

Use the attached RWP, 2010-1002 Task 1.

Using the above information determine your MAXIMUM stay time in the lower valve gallery.

RADIOLOGICAL WORK PERMIT

RWP Title: OPERATIONS ACTIVITIES UNIT-1		RWP No.: 20101002 Rev. 00 *20101002*	
Comments:			
RWP Type: GENERAL	RWP Status: ACTIVE	Begin Date: 1/1/2010	Close On Date: 12/31/2010
Prepared By: NICKELS, THOMAS W		Job Supervisor: Randall Walters	
Estimated Dose: 660 mrem	Estimated Hours: 13,500.00	Actual Dose: 1 mrem	Actual Hours: 93.55

Locations		
Buildings	Elevations	Rooms
LOW LEVEL RADWASTE BUILDING	354	NON-LOCKED HIGH RADIATION AREA
OLD RADWASTE BUILDING	354	NON-LOCKED HIGH RADIATION AREA
OUTSIDE CONTROLLED ACCESS	ALL	OUTSIDE CONTROLLED ACCESS
UNIT 1 AUXILIARY BUILDING	ALL	NON-LOCKED HIGH RADIATION AREA

Radiological Conditions		
Description	Value	Unit
Smear data is in dpm/100 cm2 unless otherwise noted.	<1K - 40K	DPM/100CM2
General area gamma dose rates are in mrem/hour unless otherwise noted.	0.1 - 200	MILLIREM/HOUR

Tasks		
Task	Description	Status
I	OPERATIONS ACTIVITIES UNIT-1	Active

Requirements	
Requirement Groups	Requirement Descriptions
N/A	

Additional Instructions	
Instructions 1:	
Instructions 2:	
Instructions 3:	

Approvals		
Approver Title	Name	Date
ALARA REVIEW	SMITH, TIMOTHY R	12/16/2009
RWP PREPARER	SMITH, TIMOTHY R	12/16/2009
RP SUPERVISOR	MARVEL JR, STANLEY D	12/21/2009

Attachments	
N/A	



Entergy
Arkansas Nuclear One

RADIOLOGICAL WORK PERMIT

<u>Task Number:</u> 1		<u>RWP No.:</u> 20101002 <u>Rev.:</u> 00	
<u>Task Description:</u> OPERATIONS ACTIVITIES UNIT-1		<u>Task Status:</u> Active	
<u>Estimate Dose:</u> 660.00		<u>Estimate Hours:</u> 13,500.00	
<u>Hi-Rad:</u> Yes	<u>Hot Particle:</u> No	<u>Locked Hi-Rad:</u> No	<u>Hi-Contamination:</u> No
Alarm Settings			
<u>Dose Alarm</u> (mrem)	20.00	<u>Dose Rate</u> (mrem/hr)	200.00

RADIOLOGICAL WORK PERMIT

Task Number: 1		RWP No.: 20101002 Rev.: 00
Requirements		
Requirement Groups	Requirement Descriptions	
Contamination Control	<p>Use RP approved mats or pads when kneeling, sitting or laying in contaminated areas.</p> <p>Notify RP when exposing a contaminated surface or opening a contaminated system. RP will expand or set up a contamination/ high contamination area to allow the work to be performed,</p> <p>All materials are required to be surveyed in a small articles monitor or hand frisked by RP (with RP Supervisor approval) PRIOR TO unconditional release from a Radiologically Controlled Area.</p> <p>Upon exit of an RCA, whole body monitoring is required utilizing a whole body contamination monitor (PCM-1B or equivalent). A whole body gamma monitor must also be cleared (PM-7 or equivalent). IF the RCA is a satellite RCA with no whole body contamination monitor available, THEN the radworker should: a) perform a hand and foot frisk. b) IF the frisk indicates contamination is present, THEN contact RP. c) IF the frisk DOES NOT indicate the presence of contamination, THEN proceed to the nearest whole body contamination monitor.</p> <p>Reaching across a contamination boundary is permitted with RP approval and the use of surgeon's gloves OR cotton liners with rubber gloves. When reaching into the area of higher contamination, gloves must be removed when hands are returned to the lower level side of the boundary.</p> <p>When exiting the Controlled Access Area (CAA) personnel must perform whole body monitoring using whole body contamination monitor (PCM-1B or equivalent) and whole body gamma monitor (PM-7 or equivalent).</p> <p>Upon exiting areas posted as "Contamination Area", perform a hand and foot frisk at the designated frisker location.</p>	
Dosimetry Requirements	<p>If an EAD dose rate alarm occurs: 1) Secure Work. 2) Back out of the immediate area until the alarm clears. 3) Notify others in your work crew. 4) Immediately notify RP for further instructions.</p> <p>Whole body DLR and EAD required for entry.</p> <p>If an EAD dose alarm occurs: 1) Secure Work. 2) Immediately leave the RCA. 3) Notify RP.</p> <p>FOR WORK IN HIGH RADIATION AREAS - If your work conditions are in OR will cause hearing impairment (such as work in a high noise area, use of a communications headset, etc.) THEN the use of an EAD amplifying device (PAM) is required.</p> <p>Periodically check your EAD. This check should be performed more frequently in areas where your ability to hear is diminished.</p>	
Engineering Controls	<p>When using temporary hoses to vent or drain a radioactive system, ensure the hose is labeled for radioactive system use only.</p> <p>When venting or draining, monitor the rate of system drain to ensure the rate of drain does NOT exceed the capacity of the floor drain.</p>	
Exposure Reduction	Use Low Dose Waiting Areas whenever possible to minimize exposure.	
Protective Requirements	<p>All joints between Anti-C gloves /sleeves and Anti-C ankles/ booties must be taped.</p> <p>Entry into High Contamination Areas require double Anti-Cs .</p> <p>Entry into Contamination Areas require single Anti-Cs.</p>	
RP Coverage	<p>Entry into High Radiation Areas requires a radiological brief from RP, AND an electronic alarming dosimeter (EAD) to meet Tech Spec monitoring requirements.</p> <p>Contact RP Supervisor or RP tech prior to entry to verify adequate RP coverage and contamination controls for your work activity. RP is not required to be notified for entries to the Auxiliary Building to perform routine activities that do not involve High Radiation Areas, Contamination Areas, overhead entry or system breach.</p>	

RADIOLOGICAL WORK PERMIT

<u>Task Number:</u> 1		<u>RWP No.:</u> 20101002 <u>Rev.:</u> 00
	<p>A "Cat 3 Advanced Radworker" may enter posted High Radiation Areas if he/she is using a gamma sensitive RP instrument to monitor dose rates. (NOTE: An EAD is NOT an appropriate survey instrument. LHRA/ VHRA entry requires continuous RP coverage.).</p> <p>Notify RP when performing operations activities which could change plant radiological conditions. For example venting/draining radioactive systems, performing degas or decay heat/shutdown cooling operations, or other non routine system functions.</p> <p>Initial / Intermittent RP coverage is required for entry in to High Radiation Areas.</p>	
Radiological Conditions	<p>Radiological conditions should be reviewed to ensure awareness of conditions in your work area. This information can be obtained from either a Status Board or RP personnel.</p> <p>Contact Radwaste Personnel for radiological conditions in the Radwaste Buildings.</p>	
Respiratory Protection	<p>Based on historical and current data, the airborne radioactivity is less than 30 percent of a DAC. Respiratory protection is not required unless otherwise directed by RP Supervision.</p>	
Special Radiological Requirements	<p>Critical Step - Prior to movement of irradiated fuel or other irradiated materials, notify RP Shift Tech or RP Supervisor that movement of fuel / irradiated components is going to occur. DO NOT move fuel or irradiated components near cask loading gate or tilt pit gate when the adjacent pit is drained as this can result in high general area dose rates.</p> <p>The prerequisite for a secondary resin transfer include 1) Secure the fill head such that changes in pressure will not cause a spill. 2) Conduct a walkdown (pre-transfer) to ensure that hose connections and leak integrity is satisfactory. 3) Construct a berm sufficient to contain the material being transferred.</p>	
Stop Work Criteria	<p>Critical Step - Radiation dose rates in the immediate area are greater than the EAD dose rate alarm set point.</p> <p>Critical Step - Work involving alpha contamination greater than or equal to 100 dpm/100cm² CAN NOT be worked on a General RWP.</p> <p>Critical Step - Indications either from local samples or remote indication (CAM) of airborne radioactivity in quantities in excess of 30 percent of a DAC.</p>	

Additional Instructions	
<u>Instructions 1:</u>	
<u>Instructions 2:</u>	
<u>Instructions 3:</u>	
Attachments	
N/A	

SRO ADMIN JPM

A5. Emergency Procedures/Plan

A1JPM-NRC-ADMINEAL11

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 1 Date: _____

TUOI NUMBER: A1JPM-NRC-ADMINEAL11

System/Duty Area: Administrative Topic-Emergency Procedures/Plan

Task: Determine Emergency Action Level

JA# ANO1-SRO-OPROC-EMERGENCY-1

KA Value RO 2.9 SRO 4.6 KA Reference 2.4.41

Approved For Administration To: RO ☐ SRO ☒

Task Location: Inside CR: ☒ Outside CR: ☐ Both: ☐

Suggested Testing Environment And Method (Perform Or Simulate): Simulate

Plant Site: _____ Simulator _____ Perform _____ Lab: _____

Position Evaluated: RO: _____ SRO: X

Actual Testing Environment: Simulator: X Plant Site: _____ Lab _____

Testing Method: Simulate: _____ Perform: X

Approximate Completion Time In Minutes: 15 Minutes

Reference(S) 1903.010 Emergency Action Level Classification, 1903.011, Emergency Response
:
Notifications

Examinee's Name: _____ SSN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time _____ Stop Time _____ Total Time _____

Signed _____ Date: _____

Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

Reactor automatically tripped due to loss of both Main Feedwater pumps at 35% power
Post trip a Steam Leak occurred in "B" Main steam line upstream of MSIV and outside of the Reactor Building
MSLI was manually actuated
"B" OTSG depressurized to zero psig

TASK STANDARD:

1. The examinee correctly classifies this event as an **NUE** per 3.1 makes notifications to plant personnel per 1903.011J thru step 4.

TASK PERFORMANCE AIDS:

1903.010 Attachments 1 and 3, 1903.011 Attachment 1, and 1903.011J

SIMULATOR SETUP:

N/A

INITIATING CUE: For the given plant conditions, determine the applicable EAL classification and initiate notifications per the applicable Shift Manager Emergency Direction and Control Checklist in 1903.011 thru step 5.

CRITICAL ELEMENTS (c): 3, 4, 5, and 6

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	1. Compare event conditions with the Index of EALs, Attachment 1 of 1903.010, Emergency Action Level Classification.	Turned to Attachment 1 of 1903.010, Index of EALs.	—	—	—
	2. Turn to appropriate EAL and compare EAL criteria with event conditions.	Turned to a specific EAL in Safety System Function, Attachment 3 of 1903.010.	—	—	—
(C)	3. Declare the emergency classification.	Declared or stated the event is an NUE per EAL 3.1, based on valid uncontrolled OTSG depressurization resulting in MSIL actuation	—	—	—
(C)	4. Select the correct form 1903.011J, NUE Emergency Direction and Control Checklist for Shift Manager.	Selected the correct form 1903.011J NUE Emergency Direction and Control Checklist for Shift Manager. Examinee fills in the data on items 1 and 2.	—	—	—
(C)	5. Direct affected Unit Shift Engineer to activate CNS per Attachment 9.	Examinee simulates directing Unit 1 SE to activate CNS per Attachment 9 of 1903.011J, step 3.2.	—	—	—
NOTE: Examiner should Role play as Unit 1 Shift Engineer, acknowledging the direction from SM to activate CNS.					
(C)	6. Direct the unaffected Unit Shift Engineer to perform notifications using form 1903.011-Y, Emergency Class Initial Notification Message.	Examinee simulates directing Unit 2 SE to perform notifications using form 1903.011-Y, Emergency Class Initial Notification Message.	—	—	—
NOTE: Examiner should Role play as Unit 2 Shift Engineer, acknowledging the direction from SM to perform notifications as directed.					
	7. Inform the Control Room Staff of the Emergency Class declaration.	Inform the Control Room Staff of the Emergency Class declaration	—	—	—
EXAMINER'S CUE: This concludes the JPM.					

END

KEY

PROC./WORK PLAN NO. 1903.010	PROCEDURE/WORK PLAN TITLE: EMERGENCY ACTION LEVEL CLASSIFICATION	PAGE: 32 of 145 CHANGE: 043
---------------------------------	---	--------------------------------

ATTACHMENT 3
UNIT 1
SECONDARY SYSTEM EVENTS

3.1

CONDITION:

Uncontrolled OTSG Depressurization Resulting in MSLI Actuation

EMERGENCY CLASSIFICATION:

Notification of Unusual Event

MODES 1-4

CRITERIA:

1. Any manual or automatic actuation of MSLI due to uncontrolled OTSG depressurization.

RELATED EALS:

OTSG Tube Leak
Radiological Effluents

TAB

3

5

KEY

KEY

NUE

This form is intended to be used by the person with Emergency Direction and Control when a Notification of Unusual Event has been declared.

1.0 Notification of Unusual Event declared:

Unit 1 Time _____ Date _____

****EMERGENCY CLASSIFICATION ANNOUNCEMENT SHOULD BE MADE WITHIN
15 MINUTES OF THE DECLARATION****

2.0 EAL No. 3.1 Description: Uncontrolled OTSG
Depressurization Resulting in MSLS activation

3.0 Activate the Computerized Notification System (CNS)

3.1 IF CNS is already activated for an NUE emergency class,
THEN go to Step 4.0 below.

3.2 Direct a Shift Engineer (SE of unit with ED&C preferred) to activate CNS in accordance with Attachment 9 of this procedure.

4.0 Initial Notification

4.1 Direct a Shift Engineer (SE from unit that does not have ED&C or unaffected unit is preferred) to perform notifications using Form 1903.011-Y, "Emergency Class Initial Notification Message".

5.0 Inform the Control Room staff of the Emergency Class declaration.

6.0 Announcements

6.1 Dial 197 and make the following announcement twice:

"Attention all personnel. Attention all personnel. This is (state name and title). A Notification of Unusual Event has been declared on Unit _____ (One/Two) based upon (state EAL condition). All personnel continue normal activities unless instructed otherwise."

NOTE: Pause approximately 15 seconds after dialing 199 in next step before speaking.

6.2 Dial 199 and repeat the announcement from Step 6.1 above twice over the EOF Public Address System.

7.0 IF on-site personnel hazards exist,
(P-15456) THEN direct implementation of protective actions as necessary.

7.1 Refer to Form 1903.030C, "Localized Evaluation Checklist", to determine if a localized evacuation will be performed.

FORM TITLE: NUE EMERGENCY DIRECTION AND CONTROL CHECKLIST	FORM NO. 1903.011J	REV. 034
---	------------------------------	--------------------

KEY

KEY

- 8.0 **IF** an approach route to the plant site should be avoided,
THEN instruct Security to direct incoming traffic. (Examples of this include security situations in which onsite/offsite personnel are directed to the EOF, radiological releases that prohibit entry through the Primary Access Point.)
- 9.0 Direct Chemistry personnel (Initial Dose Assessor) to implement procedure 1904.002, "Offsite Dose Projection - RDACS Computer Method".

Performed by: _____

FORM TITLE: NUE EMERGENCY DIRECTION AND CONTROL CHECKLIST	FORM NO. 1903.011J	REV. 034
---	------------------------------	--------------------

EXAMINEE'S COPY

INITIAL CONDITIONS:

Reactor automatically tripped due to loss of both Main Feedwater pumps at 35% power

Post trip a Steam Leak occurred in "B" Main steam line upstream of MSIV and outside of the Reactor Building

MSLI was manually actuated

"B" OTSG depressurized to zero psig

INITIATING CUE:

For the given plant conditions, determine the applicable EAL classification and initiate notifications per the applicable Shift Manager Emergency Direction and Control Checklist in 1903.011 thru step 5.

Facility: <u>ANO-1</u>	Date of Examination: <u>3-8-2010</u>
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test No.: <u>2010-1</u>

Control Room Systems® (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. A1JPM-RO-EOP26 Emergency Boration 024 AK3.01 (RO 4.1/SRO 4.4)	N/E/A/S	1 Reactivity Control
b. A1JPM-RO-EOP25 Start Standby HPI pump after OP HPI trip 006 A4.02 (RO 4.0/SRO 3.8)	N/EN/A/S	2 Reactor Coolant System Inventory Control
c. A1JPM-RO-LTOP1 Establish LTOP Protection during cool down of the RCS 006 A4.11 (RO 4.2/SRO 4.3)	M/L/S	3 Reactor Pressure Control
d. A1JPM-RO-HYD04, Initiate RB Hydrogen Sampling B&W E14 EA1.1 (RO 3.8/SRO 3.6)	C/D/EN/P/S	5 Containment Integrity
e. A1JPM-RO-EOP23 Re-energize A1, A2, H1, and H2 during Degraded power 062 A2.05 (RO 2.9/SRO 3.3)	A/D/P/S	6 Electrical
f. A1-JPM-RO-ARM01, Respond to Area Radiation Monitor alarm 072 A4.01 (RO 3.0/SRO 3.3)	C/D/S	7 Instrumentation

g.	A1JPM-RO-AOP28 Respond to lo-lo Instrument Air pressure 065 AK3.08 (RO 3.7/SRO 3.9)	D/S	8 Plant Service Systems
h.	A1JPM-RO-AOP19 Loss of Decay Heat Removal 025 AA1.02 (RO 3.8/SRO 3.9)	D/L/S	4 Heat Removal From Reactor Core (Primary)
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
i.	A1JPM-RO-EFW01 Reset EFW pump after over speed trip 061 A2.04 (RO 3.4/SRO 3.8)	D/E/R/EN	4 Heat Removal From Reactor Core (Secondary)
j.	A1JPM-RO-EDO30, Place battery charger D-03B in service. 2.1.30 (RO 4.4/SRO 4.0)	D/A/EN	6 Electrical
k.	A1JPM-RO- LRW01 Liquid Radiation waste release 2.3.11 (RO 3.8/SRO 4.3)	N/A/R	9 Radioactivity Release
[@] All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.			
* Type Codes		Criteria for RO / SRO-I / SRO-U	
(A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator		4-6 / 4-6 / 2-3 ≤ 9 / ≤ 8 / ≤ 4 ≥ 1 / ≥ 1 / ≥ 1 - / - / ≥1 (control room system) ≥ 1 / ≥ 1 / ≥ 1 ≥ 2 / ≥ 2 / ≥ 1 ≤ 3 / ≤ 3 / ≤ 2 (randomly selected) ≥ 1 / ≥ 1 / ≥ 1	

Facility: <u>ANO-1</u>		Date of Examination: <u>3-8-2010</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2010-1</u>
Control Room Systems® (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. A1JPM-RO-EOP26 Emergency Boration 024 AK3.01 (RO 4.1/SRO 4.4)	N/E/A/S	1 Reactivity Control
b. A1JPM-RO-EOP25 Start Standby HPI pump after OP HPI trip 006 A4.02 (RO 4.0/SRO 3.8)	N/EN/A/S	2 Reactor Coolant System Inventory Control
c. A1JPM-RO-LTOP1 Establish LTOP Protection during cool down of the RCS 006 A4.11 (RO 4.2/SRO 4.3)	M/L/S	3 Reactor Pressure Control
d. A1JPM-RO-HYD04, Initiate RB Hydrogen Sampling B&W E14 EA1.1 (RO 3.8/SRO 3.6)	C/D/EN/P/S	5 Containment Integrity
e. A1JPM-RO-EOP23 Re-energize A1, A2, H1, and H2 during Degraded power 062 A2.05 (RO 2.9/SRO 3.3)	A/D/P/S	6 Electrical
f. A1-JPM-RO-ARM01, Respond to Area Rad Monitor alarm 072 A4.01 (RO 3.0/SRO 3.3)	C/D/S	7 Instrumentation
g. A1JPM-RO-AOP28 Respond to lo-lo Instrument Air pressure 065 AK3.08 (RO 3.7/SRO 3.9)	D/S	8 Plant Service Systems

In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. A1JPM-RO-EFW01 Reset EFW pump after over speed trip 061 A2.04 (RO 3.4/SRO 3.8)	D/E/R/EN	4 Heat Removal From Reactor Core (Secondary)
j. A1JPM-RO-EDO30, Place battery charger D-03B in service. 2.1.30 (RO 4.4/SRO 4.0)	D/A/EN	6 Electrical
k. A1JPM-RO- LRW01 Liquid Radiation waste release 2.3.11 (RO 3.8/SRO 4.3)	N/A/R	9 Radioactivity Release
[@] All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator	4-6 / 4-6 / 2-3 $\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ - / - / ≥ 1 (control room system) $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$ (randomly selected) $\geq 1 / \geq 1 / \geq 1$	

Facility: <u>ANO-1</u>	Date of Examination: <u>3-8-2010</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>	Operating Test No.: <u>2010-1</u>

Control Room Systems® (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
b. A1JPM-RO-EOP25 Start Standby HPI pump after OP HPI trip 006 A4.02 (RO 4.0/SRO 3.8)	N/EN/A/S	2 Reactor Coolant System Inventory Control
c. A1JPM-RO-LTOP1 Establish LTOP Protection during cool down of the RCS 006 A4.11 (RO 4.2/SRO 4.3)	M/L/S	3 Reactor Pressure Control
d. A1JPM-RO-HYD04, Initiate RB Hydrogen Sampling B&W E14 EA1.1 (RO 3.8/SRO 3.6)	C/D/EN/P/S	5 Containment Integrity

In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. A1JPM-RO-EFW01 Reset EFW pump after over speed trip 061 A2.04 (RO 3.4/SRO 3.8)	D/E/R/EN	4 Heat Removal From Reactor Core (Secondary)
j. A1JPM-RO-EDO30, Place battery charger D-03B in service. 2.1.30 (RO 4.4/SRO 4.0)	D/A/EN	6 Electrical

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

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

JPM

a.

A1JPM-RO-EOP26
Emergency Boration

Simulator

RO / SROI

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 0 Date: _____JPM ID: A1JPM-RO-EOP26System/Duty Area: ABNORMAL AND EMERGENCY OPERATIONSTask: PERFORM REACTOR TRIP IMMEDIATE ACTIONSJTA# ANO1-RO-EOP-EMERG-4 & ANO1-SRO-EOP-EMERG-2KA Value RO 4.1 SRO 4.4 KA Reference 024 AK3.01Approved For Administration To: RO X SRO XTask Location: Inside CR: X Outside CR: _____ Both: _____

Suggested Testing Environment And Method (Perform or Simulate):

Plant Site: _____ Simulator: Perform Lab: _____

Position Evaluated: RO: _____ SRO: _____

Actual Testing Environment: Simulator: X Plant Site: _____ Lab: _____Testing Method: Simulate: _____ Perform: XApproximate Completion Time In Minutes: 2 MinutesReference(s): 1202.001 Reactor Trip steps 1-3

Examinee's Name: _____ KCN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time _____ Stop Time _____ Total Time _____

*Signed _____ Date: _____

*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

JPM ID: A1JPM-RO-EOP26

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

A H1 bus lockout has occurred. Reactor power is >60%. The CBOT is NOT in the control room.

TASK STANDARD:

Immediate actions of the Reactor Trip EOP are completed. This is an immediate action JPM. Actions for failure of reactor to trip using normal trip PB have been completed.

This is an Alternate Success Path JPM.

TASK PERFORMANCE AIDS: NONE

Suggested Simulator setup:

Reactor power is $\geq 60\%$
RPS will not trip the reactor (IMF RP246, IMF RP247, IMF RP248, IMF RP249)
3 control rods fail to fall into core
P36 A HPI pump in service
H1 Lockout (IMF ED184)
RD 363, RD 370, RD 380

JPM ID: A1JPM-RO-EOP26

INITIATING CUE: The SM/CRS directs you to manually trip the reactor and perform the immediate actions of the Reactor Trip EOP.

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
INSTRUCTOR NOTE: The Examinee is not required to identify the failure of RPS to trip. The trip is directed.					
C	1. Depress Reactor Trip pushbutton. <u>POSITIVE CUE:</u> Reactor Trip PB depressed.	On C03, depressed the reactor trip pushbutton.	_____	_____	_____
C	2. Identify that 3 rods have failed to insert <u>FAULTED CUE:</u> 3 rods failed to insert. Rx power is dropping	On C13, identified 3 rods have failed to trip. Verifies Rx power is dropping	_____	_____	_____
C	3. Perform Emergency Boration (RT 12). <u>POSITIVE CUE:</u> Candidate obtains RT-12.	Candidate obtains RT-12.	_____	_____	_____
	4. Dispatch operator to manually open Boric Acid To Batch Controller (CA-113). <u>POSITIVE CUE:</u> Candidate radios operator to open CA-113.	Dispatch operator to manually open Boric Acid To Batch Controller (CA-113).	_____	_____	_____
<p>Note to simulator IA operator respond in 30 seconds with information that CA-113 can not be opened due to valve stem broken</p> <p>Note to examiner candidate may verify Turbine is tripped and Sub Cooling margin adequate while awaiting for CA-113 to be open</p> <p>Note to examiner candidate should transition to Step B of RT-12.</p>					
	5. Initiate HPI per RT-2 <u>POSITIVE CUE:</u> Candidate obtains RT-2.	Candidate obtains RT-2.	_____	_____	_____
C	6. Open BWST Outlet to OP HPI pump CV-1407. <u>POSITIVE CUE:</u> Red open light on for CV-1407.	On C16, Open BWST Outlet to OP HPI pump CV-1407.	_____	_____	_____

	7. Place RCP Seal INJ Block (CV-1206) in OVRD. <u>POSITIVE CUE:</u> RCP Seal INJ Block (CV-1206) OVRD light on.	On panel C04 Place RCP Seal INJ Block (CV-1206) in OVRD.	_____	_____	_____
C	8. Open HPI Block valve associated with OP HPI Pump CV-1220. <u>POSITIVE CUE:</u> Red open light on for CV-1220.	On C16, Open HPI Block valve associated with OP HPI Pump CV-1220.	_____	_____	_____
	9. Place 3-way valve to BLEED <u>POSITIVE CUE:</u> Blue light on for 3-way valve	On C04 places 3-way valve to BLEED	_____	_____	_____
C	10. When PZR level >100" maximize letdown flow <u>POSITIVE CUE:</u> PZR level >100" Letdown flow adjusted to equal to or >80gpm	On C04 PZR level >100" raise letdown flow to >80gpm	_____	_____	_____
Note to examiner Once you can see a 10"rise in PZR level and they are injecting BWST water you can stop JPM if they have already performed the following 2 steps					
C	11. Manually trip Turbine <u>POSITIVE CUE:</u> Depresses Turbine trip button Verifies Turbine throttle and governor valves closed	Manually trip Turbine. Verifies Turbine throttle and governor valves closed	_____	_____	_____
C	12. Check adequate SCM <u>POSITIVE CUE:</u> Adequate SCM is >30F SCM 60F	Verifies adequate SCM from ICCMDS or ATOG on SPDS	_____	_____	_____

END

JPM ID: A1JPM-RO-EOP06

INITIAL CONDITIONS:

A H1 bus lockout has occurred. Reactor power is >60%. The CBOT is NOT in the control room.

INITIATING CUE:

The SM/CRS directs you to manually trip the reactor and perform the immediate actions of the Reactor Trip EOP.

**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

TITLE: REACTOR TRIP

SET #

**DOCUMENT NO.
1202.001**

**CHANGE NO.
031**

**WORK PLAN EXP. DATE
N/A**

**SAFETY-RELATED
☒ YES ☐ NO**

**IPTE
☐ YES ☒ NO**

**TEMP MOD
☐ YES ☒ NO**

**LEVEL OF USE
☒ CONTINUOUS
☐ REFERENCE
☐ INFORMATIONAL**

**PROGRAMMATIC EXCLUSION PER EN-LI-100
☐ YES ☒ NO**

When you see these TRAPS

Get these TOOLS

**Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)**

**Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover**

VERIFIED BY

DATE

TIME

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

FORM TITLE:

VERIFICATION COVER SHEET

**FORM NO.
1000.006A**

**CHANGE NO.
054**

INSTRUCTIONS

①. Manually Trip Rx.

A. Verify all rods inserted

AND

Reactor power dropping.

CONTINGENCY ACTIONS

A. Perform the following:

- 1) IF Rx fails to trip,
THEN depress CRD Power Supply
Breaker Trip PBs on C03
(A-501 and B-631).
 - a) IF A-501 or B-631 fails to trip,
THEN manually insert rods at C03.
AND
Dispatch an operator to open CRD
AC Power Supply breakers.
- 2) IF more than one rod fails to fully insert
OR
Rx power is not dropping,
THEN perform Emergency Boration
(RT 12).
- 3) DO NOT continue until the reactor is
shutdown.

INSTRUCTIONS**2. Manually trip Turbine.**

- A. Verify Turbine throttle and governor valves closed.

CONTINGENCY ACTIONS

- A. Perform the following:

- 1) **IF** 125 V DC Bus D01 is de-energized as indicated by **both** of the following,
THEN perform Loss of 125V DC (1203.036) "Loss Of Bus D01" section in conjunction with this procedure.
 - Turbine Trip Solenoid Power Available light off.
 - Breaker position indications on left side of C10 off.
- 2) **IF** SG press is < 900 psig,
THEN perform the following:
 - a) Actuate MSLI for affected SG(s)
AND
actuate EFW
AND
verify proper actuation and control (RT 6).
 - b) Advise Shift Manager to implement Emergency Action Level Classification (1903.010).
 - c) **GO TO 1202.003, "OVERCOOLING" procedure.**

INSTRUCTIONS

3. Check adequate SCM.
4. Advise Shift Manager to implement Emergency Action Level Classification (1903.010).
5. Reduce Letdown by closing Orifice Bypass (CV-1223).
6. Open BWST Outlet to OP HPI pump (CV-1407 or 1408).
7. IF Emergency Boration is NOT in progress, THEN adjust Pressurizer Level Control setpoint to 100".

CONTINGENCY ACTIONS

3. Check elapsed time since loss of adequate SCM
AND
perform the following:
 - A. IF ≤ 2 minutes have elapsed, THEN trip all RCPs.
 - B. IF > 2 minutes have elapsed, THEN leave currently running RCPs on.
 - C. Advise Shift Manager to implement Emergency Action Level Classification (1903.010).
 - D. **GO TO 1202.002, "LOSS OF SUBCOOLING MARGIN"** procedure.

**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

TITLE: REPETITIVE TASKS SET #	DOCUMENT NO. 1202.012	CHANGE NO. 008
	WORK PLAN EXP. DATE N/A	
	SAFETY-RELATED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	IPTE <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
	TEMP MOD <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	LEVEL OF USE <input checked="" type="checkbox"/> CONTINUOUS <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

When you see these TRAPS

Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)

Get these TOOLS

Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover

VERIFIED BY	DATE	TIME
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

FORM TITLE: VERIFICATION COVER SHEET	FORM NO. 1000.006A	CHANGE NO. 054
--	------------------------------	--------------------------

12. Emergency Boration:

NOTE

IF an unexpected delay occurs in implementation of Step A,
THEN promptly initiate Emergency Boration using HPI per Step B.

- A. IF Boric Acid pump (P39A or B) and Batch Controller are available,
THEN perform the following:
- 1) Dispatch operator to manually open Boric Acid To Batch Controller (CA-113).
(Located in Auxiliary Building EI 335', "B" HPI Pump Room on West Wall)
 - IF an unexpected delay occurs in implementation of Step A,
THEN promptly initiate Emergency Boration using HPI per Step B.
 - 2) Set Batch Controller for maximum batch size as follows:
 - a) Depress lower DISPLAY.
 - b) Depress TOTAL.
 - c) Depress TOTAL RESET.
 - d) Depress BATCH SET.
 - e) Depress 9, six times.
 - f) Depress ENTER.
 - g) Depress lower DISPLAY.
 - 3) Verify Condensate to Batch Controller (CV-1251) closed.
 - 4) Open Batch Controller Outlet (CV-1250).
 - 5) Verify both Letdown Filters in service (F-3A and B).
 - 6) Record initial BAAT (T-6) level _____ in.
 - 7) WHEN CA-113 is open,
THEN start available Boric Acid Pump(s) (P-39A or B or both).
 - 8) Start Batch Controller by depressing RUN key.
 - 9) Adjust Batch Controller Flow CNTRL VLV (CV-1249) to 100% open as follows:
 - a) Depress VALVE SET.
 - b) Depress numbers: 1, 0, 0.
 - c) Depress ENTER.
 - d) Depress lower DISPLAY.
 - e) Depress RATE.

(12. CONTINUED ON NEXT PAGE)

12. (Continued).

- 10) **IF** Batch Controller output rate <5 gpm
THEN perform the following:
- a) Stop running Boric Acid pump(s) (P-39A, P-39B).
 - b) Close CV-1250.
 - c) Stop Batch Controller by depressing stop key.
 - d) **GO TO** step B.
- 11) Adjust Pressurizer Level Control Setpoint to 220".
- 12) Open BWST Outlet to OP HPI Pump (CV-1407 or 1408).
- 13) **WHEN** PZR level is ≥ 100 ", **THEN** establish maximum Letdown flow.
- 14) Perform the following as necessary to maintain MU Tank level 55 to 86":
- a) Close Batch Controller Outlet (CV-1250).
 - b) Stop running Boric Acid Pump(s) (P-39A, P-39B).
 - c) Place 3-Way valve in BLEED.
 - d) **WHEN** MU Tank level is lowered to desired level, **THEN** perform the following:
 - (1) Return 3-Way valve to LETDOWN.
 - (2) Start available Boric Acid Pump(s) (P-39A or B or both).
 - (3) Open Batch Controller Outlet (CV-1250).
- 15) As time permits, determine actual required boration as follows:
- a) Obtain required boron concentration from the Plant Data Book _____ ppmB.
 - b) Calculate batch add required using Plant Computer
OR
Soluble Poison Concentration Control (1103.004), Attachment A.3,
"Calculation of Feed Volume For Batch Boration or Dilution". _____ gal.
 - c) Use 1103.004, Attachment D, "Volume of BAAT vs. Depth of Liquid"
to determine desired final BAAT level. _____ in.

(12. CONTINUED ON NEXT PAGE)

1202.012	REPETITIVE TASKS	CHANGE 008	PAGE 30 of 50
----------	------------------	---------------	---------------

Page 3 of 4

12. (Continued).

16) **WHEN** required amount of boric acid has been added per **step 15)**

OR

as determined by Reactor Engineering,

THEN perform the following:

- a) Stop Boric Acid pump (P39A and B).
- b) Close Batch Controller Outlet (CV-1250).
- c) Verify MU Tank level 55 to 86" **AND** close BWST Outlet to OP HPI pump (CV-1407 or 1408).
- d) Adjust Letdown flow to desired rate.

(12. CONTINUED ON NEXT PAGE)

1202.012	RT-12	Rev 9-04-08
----------	-------	-------------

12. (Continued).

B. IF Boric Acid pumps (P39A or B) are not available,ORBatch Controller is not available,THEN perform the following:

- 1) Initiate HPI (RT 2)
- 2) Verify HPI Block valve (CV-1220 or 1285) associated with running HPI pump open.
- 3) Place 3-Way valve in BLEED.
- 4) WHEN PZR level is ≥ 100 ",
THEN establish maximum Letdown flow.
- 5) Throttle HPI Block valve (CV-1220 or 1285) as necessary to maintain PZR level 200 to 220".
- 6) As time permits, determine actual required boration as follows:
 - a) Obtain required boron concentration from the Plant Data Book _____ ppmB.
 - b) Calculate final BWST level for required boron addition using Plant Computer
OR
Soluble Poison Concentration Control (1103.004), Attachment A.6,
"Continuous Feed and Bleed from BWST". _____ ft.
- 7) WHEN required amount of boric acid has been added per **step 6)**
OR
as determined by Reactor Engineering,
THEN perform the following:
 - a) Operate HPI as directed by CRS.
 - b) Adjust Letdown flow as directed by CRS.

END

2. Initiate HPI:

- A. IF HPI initiation is for any reason other than Emergency Boration (RT 12),
THEN isolate Letdown by closing either:

Letdown Coolers Outlet (CV-1221)

OR

Letdown Cooler Outlets (CV-1214 and 1216)

- B. IF OP or STBY HPI pump is running, THEN perform the following:

- 1) Open BWST Outlet to OP or STBY HPI pump (CV-1407 or 1408).
- 2) IF RCP Seal Injection is in service,
THEN place RCP Seal INJ Block (CV-1206) in OVRD.
- 3) WHEN associated BWST Outlet is open,
THEN open HPI Block valve associated with OP or STBY HPI pump (CV-1220 or 1285)
to maintain PZR level and RCS press (modulating valves).
- 4) IF initiating HPI for Emergency Boration only,
THEN GO TO RT12 step B.2.
- 5) IF PZR level or RCS press continues to drop,
THEN open additional HPI Block valves associated with OP or STBY HPI pump:

P36A/B	P36B/C
CV-1219	CV-1227
CV-1278	CV-1228
CV-1279	CV-1284

- C. IF OP and STBY HPI pumps are both off,
OR
PZR level or RCS press continues to drop,
THEN place ES HPI pump in service as follows:

- 1) Open BWST Outlet to ES HPI pump (CV-1407 or 1408).
- 2) Verify one of the following:
 - Both HPI RECIRC valves open (CV-1300 and 1301)
 - Fully open one HPI Block valve associated with ES HPI pump (CV-1220 or 1285) to prevent dead-heading pump
- 3) Start AUX Lube Oil pump for ES HPI pump.
- 4) IF OP and STBY pumps are both off,
THEN verify RCP Seal INJ Block (CV-1206) closed.
- 5) WHEN BWST Outlet is open, THEN start ES HPI pump.
- 6) Stop AUX Lube Oil pump.

(2. CONTINUED ON NEXT PAGE)

2. (Continued).

- 7) Open HPI Block valve associated with ES HPI pump (CV-1220 or 1285) to maintain PZR level and RCS press (modulating valves).

- a) IF initiating HPI for Emergency Boration only,
THEN GO TO RT12 step B.2.
- b) IF PZR level or RCS press continues to drop,
THEN open additional HPI Block valves associated with ES HPI pump:

P36A	P36C
CV-1219	CV-1227
CV-1278	CV-1228
CV-1279	CV-1284

- c) Monitor MUT level and control per step 2.J as necessary

- D. IF OP and STBY HPI pumps are both off,
AND
PZR level or RCS press continues to drop,
THEN place OP or STBY HPI pump in service as follows:

- 1) Open BWST Outlet to OP and STBY HPI pump.
- 2) Verify RCP Seal INJ Block (CV-1206) closed.
- 3) Close RCS Makeup Block valve (CV-1233 or 1234).
- 4) Verify one of the following:
 - Both HPI RECIRC valves open (CV-1300 and 1301)
 - Fully open one HPI Block valve associated with OP or STBY HPI pump (CV-1220 or 1285) to prevent dead-heading pump
- 5) IF P36B will be used,
THEN verify the following selected to energized bus:
 - P36B Bus Select MOD Control
 - P64B Transfer Switch
- 6) Start AUX Lube Oil pump for OP or STBY HPI pump.
- 7) Start OP or STBY HPI pump.
- 8) Stop AUX Lube Oil pump.

(2 CONTINUED ON NEXT PAGE)

2. (Continued).

- 9) **WHEN** associated BWST Outlet is open,
THEN open HPI Block valve associated with OP or STBY HPI pump (CV-1220 or 1285)
 to maintain PZR level and RCS press (modulating valves).

- a) **IF** PZR level or RCS press continues to drop,
THEN open additional HPI Block valves associated with OP or STBY HPI pump:

P36A/B	P36B/C
CV-1219	CV-1227
CV-1278	CV-1228
CV-1279	CV-1284

- E. **IF** all HPI Block valves are fully open,
AND
 additional HPI flow is required,
THEN close HPI RECIRC valve (CV-1300 or 1301).
- F. **IF** only one train of HPI is available
AND
 RCS press is >600 psig,
THEN throttle the HPI Block valve with the highest flow to within 20 gpm of the next highest flow.
- G. **IF** leakage into the RB is indicated, **THEN** maximize RB cooling:
- 1) Verify all four RB Cooling Fans running (VSF1A - D).
 - 2) Open RB Cooling Coils Service Water Inlet and Outlet valves (CV-3812, 3813, 3814 and 3815).
 - 3) Unlatch key-locked Chiller Bypass Dampers (SV-7410, 7412, 7411, 7413).
- H. Verify the following sample valves closed
- Pressurizer Steam Space (CV-1814)
 - Pressurizer Water Space (CV-1816)
 - Hot Leg Sample (SV-1840)
- I. **Unless** directed otherwise, verify the following High Point Vents closed.

A Loop	B Loop	Reactor Vessel	Pressurizer
SV-1081	SV-1091	SV-1071	SV-1077
SV-1082	SV-1092	SV-1072	SV-1079
SV-1083	SV-1093	SV-1073	
SV-1084	SV-1094	SV-1074	

(2. CONTINUED ON NEXT PAGE)

1202.012	REPETITIVE TASKS	CHANGE 008	PAGE 5 of 50
----------	------------------	---------------	--------------

Page 4 of 4

2. (Continued).

- J. **IF** MUT level is rising,
THEN perform **one or more** of the following as necessary to control MUT level.
- 1) Verify all running HPI pump flow(s) ≥ 90 gpm/pump,
AND
close HPI Recirc valve (CV-1300 or 1301).
 - a) Maintain running HPI pump flow ≥ 90 gpm/pump.
 - 2) **IF** OP or STBY HPI pump is running, **THEN** perform the following:
 - a) Verify HPI RECIRC valves open (CV-1300 and 1301).
 - b) Transfer HPI flow from the ES pump to the OP or STBY pump as necessary to control MUT level.
 - c) **IF** total HPI flow is within capacity of OP or STBY HPI pump,
THEN perform the following:
 - (1) Transfer remaining HPI flow to OP or STBY HPI pump.
 - (2) Start AUX Lube Oil pump for ES HPI pump.
 - (3) Stop ES HPI pump.
 - (4) Stop AUX Lube Oil pump.
 - 3) **IF** OP and STBY HPI pumps are **both off**,
THEN perform the following:
 - a) Start OP or STBY pump per step 2.D for this RT.
 - b) Maintain running HPI pump flow ≥ 90 gpm.
 - c) **RETURN TO step 2.J.**

END

1202.012	RT-2	Rev 3-16-06
----------	------	-------------

JPM

b.

A1JPM-RO-EOP25
Start Standby HPI pump after OP
HPI Trip

Simulator

RO / SROI / SROU

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 1 Date: _____JPM ID: A1JPM-RO-EOP25System/Duty Area: ABNORMAL AND EMERGENCY OPERATIONSTask: START STANDBY HPI PUMP AFTER OP HPI TRIPJTA# ANO1-RO-MUP-OFFNORM-35KA Value RO 4.0 SRO 3.8 KA Reference 006 A4.02Approved For Administration To: RO X SRO XTask Location: Inside CR: X Outside CR: _____ Both: _____

Suggested Testing Environment And Method (Perform or Simulate):

Plant Site: _____ Simulator: Perform Lab: _____

Position Evaluated: RO: _____ SRO: _____

Actual Testing Environment: Simulator: X Plant Site: _____ Lab: _____Testing Method: Simulate: _____ Perform: XApproximate Completion Time In Minutes: 10 MinutesReference(s): 1203.026 & 1104.002

Examinee's Name: _____ KCN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time _____ Stop Time _____ Total Time _____

*Signed _____ Date: _____

*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

JPM ID: A1JPM-RO-EOP25

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

EXAMINER NOTE

GIVE CANDIDATE 1203.026 ONLY AT THE BEGINNING OF THE JPM

- RX 100%
- P36 A HPI has tripped all actions from AOP 1203.026 have been completed up to step 6 J.
- AO is at the breaker for P36A investigating trip.
- P36A did not lose suction pressure and no RCS leakage has been detected.
- WCO is stationed in Aux building for start of standby HPI pump P36B.

TASK STANDARD:

Starting P36B HPI pump and stopping the reverse rotation of P36A by closing Recirc isolation valve MU-22A

This is an Alternate Success Path JPM.

TASK PERFORMANCE AIDS:

Markup copy of 1203.006 and 1104.002 Reverse Rotation Corrective Action

SUGGESTED SIMULATOR SETUP:

Rx 100% power
ICW cooling RCP seals
All steps of AOP complete to the point of starting standby pump
P36A aux lube oil pump secured

Use two different colors of paper for 1203.006 and 1104.002.

JPM ID: A1JPM-RO-EOP25

INITIATING CUE: The SM/CRS directs you to start the STBY HPI pump P36B per Section 2, step 6.J of 1203.026 LARGE MAKEUP AND PURIFICATION SYSTEM LEAK procedure and establish seal injection.

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	1. Read note for step J	Note read	_____	_____	_____
	2. Review step J	Determine pump does not need to be vented	_____	_____	_____
	3. Verify P36B HPI pump suction pressure >10 psig. <u>POSITIVE CUE:</u> Suction pressure >10 psig	On SPDS, Verify P36B HPI pump suction pressure >10 psig.	_____	_____	_____
	4. Verify valves CV-1207 and CV-1235 are in hand and closed	On C04, Verify valves CV-1207 and CV-1235 are in hand and closed	_____	_____	_____
	5. Start Aux lube oil pump P64B EXAMINER NOTE: P64B is started by a previous step G.1	Determine P64B already running	_____	_____	_____
C	6. After P64B has run for >1 minute start P36B HPI pump. <u>POSITIVE CUE:</u> ROLE PLAY: If asked report P36B ready for start P64B on for 1 minute, P36B HPI pump running.	On C16 Start Aux lube oil pump P64B and after 1 minute run start P36B HPI pump.	_____	_____	_____
C	7. Stop Aux lube oil pump P64B <u>POSITIVE CUE:</u> P64B is stopped.	On C16 Stop Aux lube oil pump P64B	_____	_____	_____
<p style="text-align: center;">EXAMINER NOTE</p> <p>When asked role play as WCO and report that “P36A is reverse rotating”.</p> <p>When the candidate starts to get 1104.002 from the shelf or when asked by the candidate hand candidate procedure reference to 1104.002.</p>					
	8. Check P36A for reverse rotation <u>FAULTED CUE:</u> P36A is reverse rotating	Inform WCO to check P36A for reverse rotation	_____	_____	_____

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	9. Perform "Reverse rotation Corrective Action" section of 1104.002 <u>POSITIVE CUE:</u> EXAMINER NOTE: Hand candidate this portion of procedure	Candidate obtains "Reverse rotation Corrective Action" section of 1104.002	_____	_____	_____
	10. Declare A train of HPI inoperable and enter TS 3.5.2 condition A. <u>POSITIVE CUE:</u> EXAMINER NOTE: Inform Candidate TS 3.5.2 Condition A has been entered	Candidate should declare A train of HPI inoperable and enter TS 3.5.2 condition A.	_____	_____	_____
	11. Enter P64A Aux Lube Oil pump in the Equipment status log. <u>POSITIVE CUE:</u> EXAMINER NOTE: Inform Candidate P64A Aux Lube Oil pump has been entered in the Equipment status log.	Candidate should state the entry P64 A Aux Lube Oil pump in the Equipment status log.	_____	_____	_____
C	12. Start Aux Lube Oil pump P64A for P36A <u>POSITIVE CUE:</u> P64-A indicates running.	On C16, Start Aux Lube Oil pump P64-A for P36-A	_____	_____	_____
	13. Declare P36A inoperable and enter its breaker status in the Equipment status log. <u>POSITIVE CUE:</u> EXAMINER NOTE: Inform Candidate A-306 for P36-A has been entered in the Equipment status log.	Candidate should state he is declaring P36A inoperable and enter its breaker status in the Equipment status log.	_____	_____	_____
EXAMINER NOTE Allow or direct the candidate to make the call to the AO for racking down breaker A-306. The simulator operator will rack down A306 breaker. After A306 is racked down Role Play as AO that "A306 is racked down."					
C	14. Rack down breaker A-306 <u>POSITIVE CUE:</u> Breaker indication for P36-A <ul style="list-style-type: none"> • Green light Off • Red light Off • Amber light On • White Light Off 	Candidate contacts AO to rack down breaker A-306	_____	_____	_____

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	15. Enter Mu Pump P36A Minimum Recirc valve MU-22A in the Equipment status log <u>POSITIVE CUE:</u> Inform Candidate, “MU-22A has been entered in the Equipment status log.”	Candidate should state the entry of MU-22A in the Equipment status log.	_____	_____	_____
C	16. Close Mu Pump P36A Minimum Recirc valve MU-22A <u>POSITIVE CUE:</u> Role play as WCO, “MU-22A is closed and P36A is not rotating.”	Candidate contacts WCO to close MU-22A	_____	_____	_____
C	17. Stop Aux lube oil pump P64A <u>POSITIVE CUE:</u> P64A is stopped.	On C16 Stop Aux lube oil pump P64A	_____	_____	_____
EXAMINER NOTE When cue the P36A is not rotating inform candidate JPM is over					

END

JPM ID: A1JPM-RO-EOP25

INITIAL CONDITIONS:

RX 100%

- **P36A HPI has tripped all actions from AOP 1203.026 have been completed up to step 6 J.**
- **AO is at the breaker for P36A investigating trip.**
- **P36A did not lose suction pressure and no RCS leakage has been detected.**
- **WCO is stationed in Aux building for start of standby HPI pump P36B.**

INITIATING CUE:

The SM/CRS directs you to start the STBY HPI pump P36B per step 6 J of 1203.026 LARGE MAKEUP AND PURIFICATION SYSTEM LEAK procedure and establish seal injection.

JPM

C.

A1JPM-RO-LTOP1

Establish LTOP Protection during
cooldown of the RCS

Simulator

RO / SROI / SROU

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 1 Date: _____JPM ID: A1JPM-RO-LTOP1System/Duty Area: Reactor Coolant SystemTask: Establish LTOP Protection during Cool down of the RCSJTA# ANO1-RO-OPROC-NORM-52KA Value RO 4.2 SRO 4.3 KA Reference: 006 A4.11Approved For Administration To: RO X SRO XTask Location: Inside CR X Outside CR _____ Both _____

Suggested Testing Environment and Method (Perform or Simulate):

Plant Site: _____ Simulator: Perform Lab: _____

Position Evaluated: RO: _____ SRO: _____

Actual Testing Environment: Plant Site _____ Simulator _____ Lab _____

Testing Method: Perform _____ Simulate _____

Approximate Completion Time in Minutes: 10 MinutesReference(s): 1102.010 change no. 060

Examinee's Name: _____ KCN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time _____ Stop Time _____ Total Time _____

*Signed _____ Date _____

*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

JPM ID: A1JPM-RO-LTOP1

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee

JPM INITIAL TASK CONDITIONS:

- The plant is in a cool down with RCS temperature $<300^{\circ}\text{F}$ but $>275^{\circ}\text{F}$.
- Plant computer system is not available.

TASK STANDARD:

LTOP established with all HPI to P-32 Discharge valves in the LTOP position and ERV Block open and ERV setpoint switch in the 400 psig position. And Computer Support has enabled LTOP alarms.

TASK PERFORMANCE AIDS:

1102.010 Plant Shutdown and Cool down, Step 10.2.

SIMULATOR SETUP:

RCS temperature $<300^{\circ}\text{F}$ but $>275^{\circ}\text{F}$ and RCS pressure ≤ 380 psig.
Turn off (4) PMS Monitors.

JPM ID: A1JPM-RO-LTOP1

INITIATING CUE: The SM/CRS directs you to establish LTOP protection per step 10.2 of 1102.010 Plant Shutdown and Cooldown.

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	1. Verify RCS pressure is ≤ 380 psig. <u>POSITIVE CUE:</u> RCS pressure is 360 psig.	Checked SPDS point P1020 and verified RCS pressure ≤ 380 psig.	_____	_____	_____
C	2. Place ERV Setpoint handswitch in 400 PSIG position. <u>POSITIVE CUE:</u> 400 PSIG amber light lit.	On C04, positioned the ERV Setpoint handswitch to the 400 PSIG position.	_____	_____	_____
	3. Verify the ERV Isolation (CV-1000) open. <u>POSITIVE CUE:</u> Red light ON, green light OFF.	On C04, verified CV-1000 in the open position by observing red light ON, green light OFF above HS-1000.	_____	_____	_____
	4. If the plant computer is operating, then verify the following LTOP alarm plant computer points do not have a quality of DEL: <ul style="list-style-type: none"> RCS Loop "A" Inlet Temperature Wide Range T1016 and T1017 LTOP Trouble Alarm T3071 RCS Overpressurization Enable PS3086 LTOP Constant (272 °F) CON272 EXAMINER NOTE PMS Screens will be off. <u>FAULTED CUE</u> Plant Computer is not available	Candidate should state plant computer is not available On the plant computer, used computer function SVD or GD (LTOP) and selected T1016, T1017, T3071, PS3086 and CON272 and verified that each point does not have a quality of DEL. Contact Computer Support to enable LTOP.	_____	_____	_____
	5. Contact Computer Support to enable LTOP alarm EXAMINER NOTE Role play as Computer Support, "We will enable LTOP alarm." <u>POSITIVE CUE</u> Computer support has been contacted.	Candidate should contact Computer Support to enable LTOP alarm			

JPM ID: A1JPM-RO-LTOP1

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EXAMINER NOTE Inform Examinee that the STA is monitoring/plotting PZR level versus time AND that the cool down rate is proper for Attachment J (RCS Functional Specification curve).					
	6. Verify pressurizer level is between 70" and 95". <u>POSITIVE CUE:</u> Pressurizer level is 80" and stable.	Verified pressurizer level between 70" and 95" using level indicators located on C04 or PMS/SPDS/PDS.	_____	_____	_____
	7. Monitor and plot Pressurizer level vs. time during cooldown at least once every 15 minutes while RCS temperature is $\leq 272^{\circ}\text{F}$. EXAMINER NOTE Inform candidate, " STA will monitor and plot required parameters. "	PZR level being plotted vs time.	_____	_____	_____
	8. Limit RCS cooldown rate as necessary to maintain RCS temperature above and to the right of the RCS Functional Specification Curve, Attachment J. EXAMINER NOTE Inform candidate, " STA is monitoring/plotting PZR level versus time AND that the cool down rate is proper for Attachment J. "	Attachment J available and referenced.	_____	_____	_____
EXAMINER NOTE Role play as Shift Manager and provide 8 LTOP keys to candidate and state, " Key log is complete. "					
C	9. Close the following HPI to P-32 Discharge valves and place the key switch in the LTOP position (may be done in any order): CV-1278 CV-1227 CV-1279 CV-1228 CV-1219 CV-1284 CV-1220 CV-1285 <u>POSITIVE CUE:</u> HPI injection valves Green lights on. For each valve: Block Valve Disable For LTOP in LTOP position and White light went OFF.	On C16 and C18, verified each HPI to P-32 Discharge valve closed and placed key switch for each of the eight valves in the LTOP position with white lights OFF.	_____	_____	_____
EXAMINER NOTE Inform Examinee, " It is not desired to unprotect PZR Level alarm functions and the JPM is complete. "					

END

JPM ID: A1JPM-RO-LTOP1

INITIAL CONDITIONS:

The plant is in a cooldown with RCS temperature <300°F but >275°F.

INITIATING CUE:

The SM/CRS directs you to establish LTOP protection per step 10.2 of 1102.010 Plant Shutdown and Cooldown.

JPM

d.

A1JPM-RO-HYD04
Initiate RB Hydrogen Sampling

Simulator / Control Room

RO / SROI / SROU

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 1 Date: _____

TUOI NUMBER: ANO-1-JPM-RO-HYD04

System/Duty Hydrogen Sampling/Containment Integrity
Area: _____

Task: Initiate RB Hydrogen Sampling

JA# ANO1-RO-RBH2-NORM-2

KA Value RO 3.8 SRO 3.6 KA Reference B/W E14 EA1.1

Approved For Administration To: RO ☒ SRO ☒

Task Location: Inside CR: ☒ Outside CR: ☐ Both: ☐

Suggested Testing Environment And Method (Perform Or Simulate #): Simulator/Perform

Plant Site: _____ Simulator#: _____ Perform _____ Lab: _____

Position Evaluated: RO: _____ SRO: _____

Actual Testing Environment: Simulator #: X Plant Site: _____ Lab _____

Testing Method: Simulate: _____ Perform: X

Approximate Completion Time In Minutes: 10 Minutes

Reference(S) 1104.031, Chg. 021
:

Examinee's Name: _____ SSN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time _____ Stop Time _____ Total Time _____

Signed # _____ Date: _____

TQ-202 attachment 9 is complete and on file for performance of this JPM for the current Reactor core configuration. Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

UOI NUMBER: ANO-1-JPM-RO- HYD04

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

An event has resulted in ESAS actuation. You are the CBO performing RT-10.

TASK STANDARD: Both hydrogen samplers in service.

TASK PERFORMANCE AIDS: 1104.031Exhibit A

UOI NUMBER: ANO-1-JPM-RO- HYD04

EXAMINER NOTE

Provide initial cue in front of C26 panel area.

INITIATING CUE: RT-10 directs you to initiate RB hydrogen sampling per Containment Hydrogen Control, 1104.031, Exhibit A.

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	1. Verify hydrogen sampler inside containment isolation valves open. <u>POSITIVE CUE:</u> Red lights on for CV-7444 and CV-7448.	At C-26, verified H2 Sampler C178 Return (CV-7444) and Supply (CV-7448) open.	—	—	—
(C)	2. Open hydrogen sampler isolations. <u>POSITIVE CUE:</u> Red lights on for SV-7457 and SV-7467.	At C-26, used key switch and opened C178 isolation valves, SV-7457 and SV-7467.	—	—	—
(C)	3. Start sample compressors.(C-19A &C) <u>POSITIVE CUE:</u> Handswitch light indicates red. Annunciator K16-A7 in alarm	At C-26 placed C178 sample compressor handswitch in START position. (C-19A & C)	—	—	—
	4. Observe annunciator for low flow is clear. <u>POSITIVE CUE:</u> K16-A7 not in alarm	At C-26 checked that annunciator K16-A7, RB H2 ANALYZER FLOW LOW, is clear.	—	—	—
	5. Verify hydrogen sampler inside containment isolation valves open. <u>POSITIVE CUE:</u> Red lights on for CV-7446 and CV-7450.	At C-26, verified H2 Sampler C179 Return (CV-7446) and Supply (CV-7450) open.	—	—	—
(C)	6. Open hydrogen sampler isolations. <u>POSITIVE CUE:</u> Red lights on for SV-7459 and SV-7469.	At C-26, used key switch and opened C179 isolation valves, SV-7459 and SV-7469.	—	—	—
(C)	7. Start sample compressors. (C-19B &D) <u>POSITIVE CUE:</u> Handswitch light indicates red. Annunciator K16-A7 in alarm	At C-26 placed C179 sample compressor handswitch in START position. (C-19B &D)	—	—	—
	8. Observe annunciator for low flow is clear. <u>POSITIVE CUE:</u> K16-A7 not in alarm	At C-26 checked that annunciator K16-A7, RB H2 ANALYZER FLOW LOW, is clear.	—	—	—

EXAMINER NOTE

Inform examinee that reference of 1104.031 for Hydrogen monitoring and recombiner operation is not necessary and the JPM is complete.

END

 TUI NUMBER: ANO-1-JPM-RO- HYD04

INITIAL CONDITIONS:

An event has resulted in ESAS actuation. You are the CBO performing RT-10.

INITIATING CUE:

RT-10 directs you to initiate RB hydrogen sampling per Containment Hydrogen Control, 1104.031, Exhibit A.



ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **CONTAINMENT HYDROGEN CONTROL**

DOCUMENT NO.
1104.031

CHANGE NO.
021

SET #

WORK PLAN EXP. DATE
N/A

SAFETY-RELATED
☒ YES ☐ NO

IPTE
☐ YES ☒ NO

TEMP MOD
☐ YES ☒ NO

LEVEL OF USE
☒ CONTINUOUS
☐ REFERENCE
☐ INFORMATIONAL

PROGRAMMATIC EXCLUSION PER EN-LI-100
☐ YES ☒ NO

When you see these **TRAPS**

Get these **TOOLS**

Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)

Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover

VERIFIED BY

DATE

TIME

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

FORM TITLE:

VERIFICATION COVER SHEET

FORM NO.
1000.006A

CHANGE NO.
054

PROC./WORK PLAN NO. 1104.031	PROCEDURE/WORK PLAN TITLE: CONTAINMENT HYDROGEN CONTROL	PAGE: 27 of 59 CHANGE: 021
--	---	---

1104.031
EXHIBIT A

Revised 05/01/2001

HYDROGEN SAMPLER OPERATION

- 1.0 Place hydrogen sampler panel C178 (LSPPR) in operation as follows:
 - 1.1 Verify hydrogen sampler inside containment isolation valves open.
 - H₂ Sampler C178 Return (CV-7444)
 - H₂ Sampler C178 Supply (CV-7448)
 - 1.2 Open Hydrogen Sampler C178 Isolations (SV-7457 and SV-7467) (key switch on C26).

NOTE

At HS for sample compressors, the red light ON indicates both compressors running. Green light ON indicates that one or both sample compressors are not running.

- 1.3 Start Sample Compressors (C-19A & C).
- 1.4 Observe for no low flow at RB H₂ ANALYZER FLOW LOW (K16-A7).
- 2.0 Place H₂ Sampler Panel C179 (UNPPR) in operation as follows:
 - 2.1 Verify hydrogen sampler inside containment isolation valves open.
 - H₂ Sampler C179/PASS/Rad Monitor Return (CV-7446)
 - H₂ Sampler C179 Supply (CV-7450)
 - 2.2 Open Hydrogen Sampler C179 Isolations (SV-7459 and SV-7469) (key switch on C26).
 - 2.3 Start Sample Compressors (C-19B & D).
 - 2.4 Observe for no low flow at RB H₂ ANALYZER FLOW LOW (K16-A7).
- 3.0 Refer to Containment Hydrogen Control (1104.031) for hydrogen monitoring and Hydrogen Recombiner operation.

JPM

e.

A1JPM-RO-EOP23
Re-energize A1, A2, H1 and H2
during Degraded Power

Simulator

RO / SROI

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 1 Date: _____TUOI NUMBER: ANO-1-JPM-RO-EOP23System/Duty Area: AC Electrical Distribution / ElectricalTask: Re-energize A1, A2, H1, H2 during a Degraded PowerJA# ANO1-RO-EOP-EMERG-35KA Value RO 2.9 SRO 3.3 KA Reference 062 A2.05Approved For Administration To: RO ☒ SRO ☒Task Location: Inside CR: ☒ Outside CR: ☐ Both: ☐

Suggested Testing Environment And Method (Perform Or Simulate):

Plant Site: _____ Simulator: Perform Lab: _____

Position Evaluated: RO: _____ SRO: _____

Actual Testing Environment: Simulator: X Plant Site: _____ Lab: _____Testing Method: Simulate: _____ Perform: XApproximate Completion Time In Minutes: 5 MinutesReference(S): 1202.007

Examinee's Name: _____ SSN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time _____ Stop Time _____ Total Time _____

Signed # _____ Date: _____

TQ-202 attachment 9 is complete and on file for performance of this JPM for the current Reactor core configuration.

Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

TUOI NUMBER: ANO-1-JPM-RO- EOP23

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

- The plant is in a Degraded Power condition.
- The dispatcher has restored offsite power and SU#1 voltage is >22KV.

TASK STANDARD: A1, A2, H1, H2, A3, and A4 energized with normal voltage.

This is an Alternate Success Path JPM.

TASK PERFORMANCE AIDS: 1202.007, step 72

Notes to IA operator and examiner:

1. Establish a stable plant post trip from a loss of offsite power IMF ED183
2. Remove the malfunction Delete ED183
3. Close the following switchyard breakers: B0125, B5148, B1215

Prior to starting this JPM, insert the override **IOR DI_A309C** False so that A-309 does not close, then remove override prior to candidate taking alternate success path.

TUOI NUMBER: ANO-1-JPM-RO- EOP23

INITIATING CUE: The SM/CRS directs you to complete step 72 of 1202.007 to re-energize A1, A2, A3, A4, H1, and H2 per step 72 of 1202.007.

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	1. Check associated bus L.O. RELAY TRIP alarm clear on K02.	On K02, checked K02-A4/A5/A6/A7 alarms clear.	_____	_____	_____
	2. Check A-409 open.	On C10, checked A2 to A4 supply breaker A-409 open.	_____	_____	_____
EXAMINER NOTE					
Steps 3 and 4 are performed four times.					
(C)	3. Remove bus feeder breaker handswitch from PULL-TO-LOCK. _____ A-113 _____ A-213 _____ H-15 _____ H-25	On C10, removed breaker handswitches for A-113, A-213, H-15, H-25 from PULL-TO-LOCK.	_____	_____	_____
	4. Check bus energized. _____ A1 _____ A2 _____ H1 _____ H2	On C10, observed feeder breakers closed and bus voltage normal for buses A1, A2, H1, and H2.	_____	_____	_____
EXAMINER NOTE					
In the following step A4 will be energized but A3 will not forcing Examinee to take alternate path.					
	5. Check A3 and A4 energized. <u>NEGATIVE CUE:</u> A4 bus voltage normal BUT A3 bus voltage zero.	On C10, checked A3 and A4 bus voltage normal. Determine A3 bus voltage 0 and bus A4 voltage normal.	_____	_____	_____
EXAMINER NOTE					
Inform examinee that, "Power will be from Unit One, NOT Unit Two."					
	6. Check associated bus L.O. RELAY TRIP alarm clear on K02.	On K02, checked K02-B6 alarm clear.	_____	_____	_____
	7. Notify personnel attempting to restore EDG that A3 (A4) is about to be energized from off-site power.	Notified personnel restoring EDG #1.	_____	_____	_____
EXAMINER NOTE					
Role play as AO, "All personnel are clear of the#1 EDG room."					
(C)	8. Turn sync switch for A-309 ON.	On C10, turned sync switch for A-309 ON.	_____	_____	_____
(C)	9. Defeat undervoltage trip by holding A-309 handswitch in CLOSE position until A3 bus energized. <u>POSITIVE CUE:</u> A3 bus voltage normal.	On C10, held A-309 handswitch in CLOSE position until A3 bus energized.	_____	_____	_____
EXAMINER NOTE					
After A309 is closed and bus A3 is energized, tell the examinee the JPM is complete.					

END

TUOI NUMBER: ANO-1-JPM-RO- EOP23

INITIAL CONDITIONS:

- The plant is in a Degraded Power condition.
- The dispatcher has restored offsite power and SU#1 voltage is >22KV.

INITIATING CUE:

The SM/CRS directs you to complete step 72 of 1202.007 to re-energize A1, A2, A3, A4, H1, and H2 per step 72 of 1202.007.

**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

TITLE: DEGRADED POWER

SET #

**DOCUMENT NO.
1202.007**

**CHANGE NO.
009**

**WORK PLAN EXP. DATE
N/A**

**SAFETY-RELATED
☒ YES ☐ NO**

**IPTE
☐ YES ☒ NO**

**TEMP MOD
☐ YES ☒ NO**

**LEVEL OF USE
☒ CONTINUOUS
☐ REFERENCE
☐ INFORMATIONAL**

**PROGRAMMATIC EXCLUSION PER EN-LI-100
☐ YES ☒ NO**

When you see these TRAPS

Get these TOOLS

Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)

Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover

VERIFIED BY

DATE

TIME

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

FORM TITLE:

VERIFICATION COVER SHEET

**FORM NO.
1000.006A**

**CHANGE NO.
054**

INSTRUCTIONS

71. (continued).

72. Re-energize A1, A2, H1, and H2 by performing the following for each bus:

A. Check associated bus L.O. RELAY TRIP alarm clear on K02.

B. Check A-409 open.

C. IF buses are to be energized from SU2, THEN notify Unit 2.

(72. CONTINUED ON NEXT PAGE)

CONTINGENCY ACTIONSNOTE

Off-site power is considered degraded if SU1 voltage is <22KV AND any of the following conditions exists:

- SU2 <158KV
- Auto X-FMR not energized from 500KV
- Auto X-FMR not aligned to SU2
- Unit 2 on SU2
- SU2 V REG 3% reduction enabled

D. IF off-site power is unavailable OR degraded, THEN perform the following:

- 1) Notify Dispatcher to restore power.
- 2) **GO TO step 94.**

A. Determine AND correct cause of L.O. RELAY TRIP before energizing bus, while continuing with this procedure (Refer to Electrical System Operations (1107.001), "Re-closing Tripped Bus or MCC Feeder Breakers" section).

B. IF A2 is being supplied by A4, THEN GO TO step 113.

INSTRUCTIONS

72. (Continued).

- D. Remove bus feeder breaker handswitch from PULL-TO-LOCK

AND

check bus energized.

- E. Check A3 and A4 energized.

(72. CONTINUED ON NEXT PAGE)

CONTINGENCY ACTIONS

- D. Turn SYNC switch for associated bus feeder breaker ON

AND

close breaker from handswitch.

- 1) IF breaker fails to close,
THEN reset breaker anti-pump feature by taking handswitch to PULL-TO-LOCK AND releasing.
- 2) IF neither, A1 nor A2 is energized,
THEN GO TO step 94.

- E. Perform the following:

- 1) IF off-site power is from SU2,
THEN notify Unit 2 prior to energizing A3 and A4.
- 2) Restore power to bus A3 (A4) from A1 (A2) by performing the following:
 - a) Check associated bus L.O. RELAY TRIP alarm clear on K02.
 - (1) IF L.O. RELAY TRIP is alarming,
THEN determine

AND

correct cause of L.O. RELAY TRIP before energizing bus, while continuing with this procedure (Refer to Electrical System Operations (1107.001), "Re-closing Tripped Bus or MCC Feeder Breakers" section).
 - b) Notify personnel attempting to restore EDG that A3 (A4) is about to be energized from off-site power.

1202.007	DEGRADED POWER	CHANGE 009	PAGE 39 of 64
----------	----------------	---------------	---------------

INSTRUCTIONS

CONTINGENCY ACTIONS

72. (Continued).

- c) Turn SYNC switch for A-309
(A-409) ON

AND

defeat undervoltage trip by holding
handswitch in CLOSE position until
bus is energized.

73. Dispatch an operator to restart Condensate
Transfer pump (P9A or B).

74. Restore ICW cooling as follows:

- A. Verify at least one Service Water to ICW
Coolers Supply open (CV-3811 or 3820).
- B. Verify at least one Instrument Air
Compressor running (C28A/B).

- B. **IF** C28A and B are **not** available,
THEN dispatch an operator to restart
Instrument Air Compressors (C2A and B).
 - 1) **IF** ESAS signal is present,
THEN depress CH1 and CH2 ES
Electrical Alignment MAN PBs on C16
and 18 to allow restart of Instrument Air
Compressors
C2A and B.
 - 2) **IF** C2A and B are **not** available,
THEN dispatch an operator to
cross-connect with Breathing Air using
Breathing Air System (1104.012).

C. Restart two ICW pumps (P33A, B, C).

- C. **IF** only ICW pump is available,
THEN open ICW Suction and Discharge
Crossconnects
(CV-2238, 2239, 2240, 2241).

D. Verify CRD Cooling pump running
(P79A or B).

(74. CONTINUED ON NEXT PAGE)

INSTRUCTIONS

74. (Continued).

- E. Verify RCP Seal Cooling pump running (P114A or B)

AND

record current time for reference in step 83.

75. Unless fuel damage or RCS to ICW leak is suspected, restore Letdown flow (RT 13).

76. Restart Spent Fuel Cooling pump (P40A or B).

77. Restore normal Makeup and Seal Injection as follows, unless previously restored:

- A. IF Seal INJ CV-1207 Bypass is open (MU-1207-3),
THEN perform the following:

- 1) Place RC Pump Seals Total INJ Flow in HAND AND close (CV-1207).
- 2) Dispatch an operator to perform the following:
 - a) Open Seal INJ CV-1207 Inlet (MU-1207-1)

AND

stand by to close Seal INJ CV-1207 Bypass (MU-1207-3).

- 3) Direct dispatched operator to slowly throttle closed MU-1207-3.
- 4) Throttle open CV-1207 in HAND to maintain RCP Seals Total INJ flow 8 to 12 gpm until MU-1207-3 is closed.

(77. CONTINUED ON NEXT PAGE)

CONTINGENCY ACTIONS

- E. IF P114A and B are not available,
THEN open Pump Bypass (CV-2287)

AND

record current time for reference in step 83.

JPM

f.

A1JPM-RO-ARM01
Respond to Area Radiation Monitor
Alarm

Simulator / Control Room

RO / SROI

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 1 Date: _____TUOI NUMBER: A1JPM-RO-ARM01System/Duty Area: Area Radiation Monitor SystemTask: Respond to Area Radiation Monitor alarmJA# ANO1-WCO-RMS-SURV-7KA Value RO 3.0 SRO 3.3 KA Reference 072 A4.01Approved For Administration To: RO ☒ SRO ☒Task Location: Inside CR: ☒ Outside CR: ☐ Both: ☐

Suggested Testing Environment And Method (Perform Or Simulate #):

Plant Site: _____ Simulator#: _____ Perform _____ Lab: _____

Position Evaluated: RO: _____ SRO: _____

Actual Testing Environment: Simulator #: _____ Plant Site: _____ Lab _____

Testing Method: Simulate: _____ Perform: _____

Approximate Completion Time In Minutes: _____ 10 Minutes

Reference(s): 1305.001

Examinee's Name: _____ SSN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time _____ Stop Time _____ Total Time _____

Signed _____ Date: _____

TQ-202 attachment 9 is complete and on file for performance of this JPM for the current Reactor core configuration. Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

TUOI NUMBER: A1JPM-RO-ARM01

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

- Annunciator K10-B1, AREA MONITOR RADIATION HI, has alarmed.
- A check of C-25 Bay 3 shows RI-8006, Radio Chem Lab, Warning light is on and is reading 1.5 mR/hr.
- Radiation Protection has surveyed the area and reported to the CRS.

TASK STANDARD:

RI-8006 Radio Chem Lab warning setpoint adjusted to 1.6 to 2.5 mR/hr.

TASK PERFORMANCE AIDS:

Picture of alarm setting potentiometers.

Marked up copy of 1305.001, supplement 6.

Small insulated flat screw driver.

SUGGESTED SIMULATOR SETUP:

Annunciator K10-B1, AREA MONITOR RADIATION HI, has alarmed.
RI-8006 override to 1.5 mr/hr.

TUOI NUMBER: A1JPM-RO-ARM01

INITIATING CUE: The CRS directs you to adjust the warning setpoint for RI-8006 to 2.0 mR/hr per 1305.001 Radiation Monitoring system check and test step 2.3.

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EXAMINER NOTE When trainee places alarm setting switch in the WARNING position, if not simulated then inform trainee, "Indicator is reading 1 mR/hr."					
	1. On RI-8006, place alarm setting switch in the WARNING position and observe warning setpoint value on indicator. POSITIVE CUE: RI-8006 alarm setting switch in WARNING.	On C25 Bay 3, placed RI-8006 alarm setting switch in WARNING. Observed warning setpoint value.	—	—	—
C	2. Slide RI-8006 drawer out. POSITIVE CUE: RI-8006 drawer out.	On RI-8006, depressed handle release buttons and pulled drawer out.	—	—	—
C	3. Hold alarm setting switch in the WARNING position and adjust warning potentiometer to 2.0 mR/hr. EXAMINER NOTE Ask candidate, "What would you use to make adjustment?" Correct answer is a small (insulated flat head screw driver). Inform candidate, "Warning RI-8006 meter indicating 2.0 mR/hr."	On RI-8006 drawer, held alarm setting switch in the WARNING position and adjusted warning potentiometer to 2.0 mR/hr.	—	—	—
	4. Slide RI-8006 drawer in. POSITIVE CUE: RI-8006 drawer inserted.	On RI-8006, slid drawer in.	—	—	—
C	5. Reset Warning alarm. EXAMINER NOTE When candidate places alarm reset switch to reset, then inform candidate, "Warning alarm clear."	On RI-8006, turned ALARM RESET/CHECK SOURCE switch to ALARM RESET.	—	—	—
	6. Record as-left setpoint value in section 3.0.	In section 3.0, recorded value of 2.0 mR/hr in warning as-left setpoint space for RI-8006.	—	—	—
EXAMINER NOTE When trainee Record as-left setpoint value in section 3.0, then inform trainee the, "JPM is complete."					

END

TUOI NUMBER: A1JPM-RO-ARM01

INITIAL CONDITIONS:

- Annunciator K10-B1, AREA MONITOR RADIATION HI, has alarmed.
- A check of C-25 Bay 3 shows RI-8006, Radio Chem Lab, Warning light is on and is reading 1.5 mR/hr.
- Radiation Protection has surveyed the area and reported to the CRS.

INITIATING CUE:

The CRS directs you to adjust the warning setpoint for RI-8006 to 2.0 mR/hr, per 1305.001 Radiation Monitoring system check and test step 2.3.

WARNING

ALARM SETTING

HIGH

**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

**TITLE: RADIATION MONITORING SYSTEM CHECK
AND TEST**

DOCUMENT NO.
1305.001

CHANGE NO.
017

WORK PLAN EXP. DATE
N/A

SET #

SAFETY-RELATED
☒ YES ☐ NO

IPTE
☐ YES ☒ NO

TEMP MOD
☐ YES ☒ NO

LEVEL OF USE
☒ CONTINUOUS
☐ REFERENCE
☐ INFORMATIONAL

PROGRAMMATIC EXCLUSION PER EN-LI-100
☐ YES ☒ NO

When you see these TRAPS

Get these TOOLS

**Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)**

**Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover**

VERIFIED BY

DATE

TIME

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

FORM TITLE:
VERIFICATION COVER SHEET

FORM NO.
1000.006A

CHANGE NO.
054

PROC./WORK PLAN NO. 1305.001	PROCEDURE/WORK PLAN TITLE: RADIATION MONITORING SYSTEM CHECK AND TEST	PAGE: 42 of 52 CHANGE: 017
---------------------------------	--	-------------------------------

SUPPLEMENT 6

Page 1 of 11

AREA RADIATION MONITOR MONTHLY ALARM CHECK

This check verifies high alarm setpoints on Unit 1 Area Monitors and checks or sets the warning alarm setpoint to provide a meaningful alarm. This check records the high alarm setpoint for Unit 1 CR Supply Vent Rad Detectors 2RITS-8001A AND 2RITS-8001B.

1.0 INITIAL CONDITIONS

1.1 Check purpose of this test.

- ☐ Regularly scheduled monthly test.
☒ Other (Describe in section 4.0.)

1.2 Observe the following precautions:

- The warning alarm on Control Room Area Monitor (RI-8001) is interlocked with the control room isolation system.

NOTE

Control Room Area Monitor does not have audible alarm.

- The hi alarm of all area monitors is interlocked to give audible and visual remote alarms at the location of each monitor.
- The alarm setting knob will cause RAD MONITOR IN TEST annunciator (K-10-F1) to alarm. It will not cause a warning or hi alarm interlock to actuate.
- The energizing of the check source will cause automatic interlocks of the alarm and warning to actuate if the setpoint is exceeded. Do not energize the check source during the performance of this test.
- IF elevated background radiation levels exceed the Maximum Normal Warning setpoint listed in section 3.0, THEN the warning setpoint may be adjusted above the Maximum Normal setpoints by performance of this supplement. Documentation of reason for elevated radiation levels will be recorded in section 4.0.
- The warning setpoint shall NOT be set below the Minimum setpoint listed in Section 3.0.
- Except for brief periods during evolutions such as Dry Fuel movement, the high alarm setpoint shall NOT exceed Maximum High Alarm Setpoint listed in Section 3.0.

PROC./WORK PLAN NO. 1305.001	PROCEDURE/WORK PLAN TITLE: RADIATION MONITORING SYSTEM CHECK AND TEST	PAGE: 43 of 52 CHANGE: 017
---------------------------------	---	-------------------------------

SUPPLEMENT 6

Page 2 of 11

2.0 PROCEDURE

2.1 Perform one of the following: N/A method not used.

• IF performing the monthly test,
THEN complete steps 2.2 for Control Room Area Radiation Monitor (RE-8001) and step 2.3 for all other area monitors listed in Section 3.0.

• IF performing this supplement for other than monthly requirement,
THEN perform only the area monitor(s) determined by the Shift Manager/CRS and N/A all others.

2.2 Control Room Area Radiation Monitor (RE-8001)

CAUTION

The warning alarm on Control Room Monitor (RI-8001) is interlocked with the control room isolation system. Energizing of the check source will cause automatic actuation of the Control Room isolation system when the warning alarm setpoint is reached.

2.2.1 Place Alarm Setting switch in the WARNING position and observe warning setpoint value on RI-8001 is ≥ 1 MR/HR.

NOTE

Warning setpoints should be adjusted as necessary to a value high enough to preclude warning actuations due to electrical noise deflections but low enough to detect rising radiation levels as early as possible.

2.2.2 IF RI-8001 background is such that the warning setpoint needs to be adjusted,
THEN adjust the setpoint as follows.

A. Notify Unit 2 to place CONTROL ROOM DAMPER HANDSWITCH (2HS-8685-2) on 2C33-2 in the CLOSE position.

B. Isolate Unit 1 Control Room by placing Channel A and Channel B Control Room Isolation handswitches in the MAN position.

C. Verify Actuation Control Room Isolation (K16-B2) in alarm indicating isolation of control room.

PROC./WORK PLAN NO. 1305.001	PROCEDURE/WORK PLAN TITLE: RADIATION MONITORING SYSTEM CHECK AND TEST	PAGE: 44 of 52 CHANGE: 017
---------------------------------	---	-------------------------------

SUPPLEMENT 6

Page 3 of 11

{4.3.3}

- DA* Slide Area Monitor drawer out to gain access to Alarm Setting potentiometers.
- E.* While holding the Alarm Setting switch in the WARNING position, adjust the warning potentiometer to the desired setpoint but not less than 1 MR/HR.
- F.* Slide Area Monitor drawer back to the normal position and secure.
- G.* Reset alarms if applicable.
- H.* Place Channel A and Channel B Control Room Isolation handswitches in the AUTO position.
- I.* At C141 in the computer room, depress PB-1 Unit 1 Radiation Reset pushbutton.
- J.* At C141A in the computer room, depress PB-2 System Trip Reset pushbutton.
- K.* At C141B in the computer room, depress PB-2 System Trip Reset pushbutton.
- L.* Verify all Control Room Isolation trips reset and K16-B2 is clear.
- M.* Notify Unit 2 to place 2HS-8685-2 on 2C33-2 in the AUTO position.
- 2.2.3* Record As-Left Setpoint for RI-8001 in section 3.0.
- 2.2.4* Place the Alarm Setting switch in the HIGH position and observe the high alarm setpoint on RI-8001.
- 2.2.5* Release switch and record As-Left setpoint in section 3.0.
- 2.2.6* Using DBM function of PMS computer, verify Area Monitor RI-8001 alarm setpoint to be in accordance with as-left data of this supplement.

PROC./WORK PLAN NO. 1305.001	PROCEDURE/WORK PLAN TITLE: RADIATION MONITORING SYSTEM CHECK AND TEST	PAGE: 45 of 52 CHANGE: 017
-------------------------------------	--	-------------------------------

SUPPLEMENT 6

Page 4 of 11

2.3 For each remaining area monitor perform the following:

NOTE

- Monitors may be tested in any order. Test steps shall be followed in order.
- Warning setpoints should be adjusted as necessary to a value high enough to preclude warning actuations due to electrical noise deflections but low enough to detect rising radiation levels as early as possible.

2.3.1 Place Alarm Setting switch in the WARNING position and observe warning setpoint value on indicator.

2.3.2 IF the background for the monitor is such that the warning setpoint needs to be adjusted, THEN adjust the setpoint as follows.

- Slide Area Monitor drawer out to gain access to Alarm Setting potentiometers.
- While holding the Alarm Setting switch in the WARNING position, adjust the warning potentiometer to the desired setpoint.
- Slide Area Monitor drawer back to the normal position and secure.
- Reset alarms if applicable.

2.3.3 Record As-Left Setpoint for each monitor in section 3.0.

NOTE

Except for brief periods during evolutions such as Dry Fuel movement, the high alarm setpoint shall NOT exceed Maximum High Alarm Setpoint listed in Section 3.0. The high alarm setpoint should be adjusted slightly below or equal to the Maximum High Alarm Setpoint listed in Section 3.0.

2.3.4 Place the Alarm Setting switch in the HIGH position and observe the high alarm setpoint on indicator.

PROC./WORK PLAN NO. 1305.001	PROCEDURE/WORK PLAN TITLE: RADIATION MONITORING SYSTEM CHECK AND TEST	PAGE: 46 of 52 CHANGE: 017
---------------------------------	---	-------------------------------

SUPPLEMENT 6

Page 5 of 11

2.3.5

IF Alarm setpoint exceeds max allowable value
OR if high alarm setpoint must be adjusted for any reason,
THEN adjust the setpoint as follows:

- A. Slide Area Monitor drawer out to gain access to Alarm Setting potentiometers.
- B. While holding the Alarm Setting switch in the HIGH position, adjust the HIGH potentiometer to the desired setpoint.
- C. Slide Area Monitor drawer back to the normal position and secure.
- D. Reset alarms if applicable.
- E. Inform SM/CRS of any abnormal findings.

2.3.6
2.3.7

Record As-Left Setpoint in section 3.0.

Using "DBM" function of PMS computer, verify Area Monitor alarm setpoints to be in accordance with as-left data of this supplement.

2.4

Check Unit 1 CR Supply Vent Rad Detector 2RITS-8001A high alarm setpoint as follows.

- 2.4.1 At 2RITS-8001A, press MODE to display high alarm setpoint and record in section 3.0.
- 2.4.2 At PMS computer, check 2RITS-8001A High Alarm Static Point (C02-7) indicates same value as monitor setpoint.
 - A. IF C02-7 is NOT indicating same value as monitor setpoint,
THEN using PMS "CREVSA" display, change point to display current high alarm setpoint.
- 2.4.3 Using "DBM" function on PMS computer, check alarm setting for (R8001AMG) with Low setpoint at ≥ 1.2 and High setpoint at ≤ 1.8 .

PROC./WORK PLAN NO. 1305.001	PROCEDURE/WORK PLAN TITLE: RADIATION MONITORING SYSTEM CHECK AND TEST	PAGE: 47 of 52 CHANGE: 017
---------------------------------	--	-------------------------------

SUPPLEMENT 6

Page 6 of 11

2.5

Check Unit 1 CR Supply Vent Rad Detector 2RITS-8001B high alarm setpoint as follows.

2.5.1 At 2RITS-8001B, press MODE to display high alarm setpoint and record in section 3.0.

2.5.2 At PMS computer, check 2RITS-8001B High Alarm Static Point (C03-7) indicates same value as monitor setpoint.

A. IF C03-7 is NOT indicating same value as monitor setpoint,
THEN using PMS "CREVSB" display, change point to display current high alarm setpoint.

2.5.3 Using "DBM" function on PMS computer, check alarm setting for (R8001BMG) with Low setpoint at ≥ 1.2 and High setpoint at ≤ 1.8 .

PROC./WORK PLAN NO. 1305.001	PROCEDURE/WORK PLAN TITLE: RADIATION MONITORING SYSTEM CHECK AND TEST	PAGE: 48 of 52 CHANGE: 017
--	---	---

SUPPLEMENT 6

Page 7 of 11

3.0 ACCEPTANCE CRITERIA

- 3.1 Compare the As-Left Setpoint to the Maximum Normal Setpoint and the As-Left High Alarm Setpoint to the Max High Alarm Setpoint.

NOTE

- Warning alarm setpoints should be adjusted as necessary to a value high enough to preclude any warning actuations due to electrical noise deflections but low enough to detect rising radiation levels as early as possible.
- High alarm setpoints are based, with the noted exceptions, on minimizing spurious alarms due to transient radiation level rises but low enough to provide early detection of abnormal radiological conditions in the area.

		WARNING SETTING				ALARM SETTING		
Monitor Indicator Number/Description	Minimum Setpoint	As-Left Setpoint	Maximum Normal Setpoint	Is As-Left Setpoint ≤ Max Normal Setpoint?	As-Left High Alarm Setpoint	Maximum High Alarm Setpoint	Is As-Left High Alarm Setpoint ≤ Max High Alarm Setpoint?	
{4.3.1} RI-8001 {4.3.3} Control Room	1 mR/HR	NA	1 mR/HR (2)	YES NO	NA	7 mR/HR (1)	YES NO	
RI-8002 Relay Room	1 mR/HR		1 mR/HR (2)	YES NO		2 mR/HR	YES NO	
RI-8003 Machine Shop	1 mR/HR		1 mR/HR (2)	YES NO		2 mR/HR	YES NO	
RI-8004 Outside Stairway Elev. 317'	1 mR/HR		10 mR/HR	YES NO		20 mR/HR	YES NO	
RI-8005 Sample Room Vestibule	1 mR/HR	✓	2.5 mR/HR	YES NO	✓	7.5 mR/HR	YES NO	
{4.3.1} Note (1) {4.3.2}	<p>This is based on the Control Room being designed for continuous occupancy at a maximum of 5 Rem for the duration of a maximum hypothetical accident (30 days continuous occupancy) according to ANO-1 SAR. It was calculated as follows:</p> $\frac{5 \times 10^3 \text{ mR}}{(30 \text{ days}) (24 \text{ hr/day})} \cong 7 \text{ mR/HR}$ <p>Note (2) This is based on the design value for this area during normal operation (assuming 1% failed fuel) according to ANO-1 SAR.</p>							

(continued next page)

PROC./WORK PLAN NO. 1305.001	PROCEDURE/WORK PLAN TITLE: RADIATION MONITORING SYSTEM CHECK AND TEST	PAGE: 49 of 52 CHANGE: 017
--	---	---

SUPPLEMENT 6

Page 8 of 11

3.0 (Continued)

Monitor Indicator Number/Description	WARNING SETTING				ALARM SETTING		
	Minimum Setpoint	As-Left Setpoint	Maximum Normal Setpoint	Is As-Left Setpoint ≤ Max Normal Setpoint?	As-Left High Alarm Setpoint	Maximum High Alarm Setpoint	Is As-Left High Alarm Setpoint ≤ Max High Alarm Setpoint?
RI-8006 Radio Chem Lab	1 mR/HR		2.5 mR/HR	YES NO	NA	7.5 mR/HR	NA YES NO
RI-8007 Outside Stairway Elev. 369'	1 mR/HR	NA	2.5 mR/HR	NA YES NO		7.5 mR/HR	YES NO
RI-8008 Decon Rm Elev. 386'	1 mR/HR		10 mR/HR	YES NO		20 mR/HR	YES NO
RI-8009 SF Pool	1 mR/HR		10 mR/HR	YES NO		20 mR/HR	YES NO
RI-8010 CA Area Elev. 386'	1 mR/HR		1 mR/HR (2)	YES NO		2.5 mR/HR	YES NO
RI-8011 Outside Stairway Elev. 335'	1 mR/HR		10 mR/HR	YES NO		20 mR/HR	YES NO
RI-8012 Piping Area I By Elev Elev. 335'	1 mR/HR		10 mR/HR	YES NO		20 mR/HR	YES NO
RI-8013 Piping Area II By Emerg Feed Pmp	1 mR/HR		2.5 mR/HR	YES NO		7.5 mR/HR	YES NO
RI-8014 Stairway Vestibule	1 mR/HR		10 mR/HR	YES NO		20 mR/HR	YES NO
RI-8015 Cond. Demin	1 mR/HR		1 mR/HR (2)	YES NO		2 mR/HR	YES NO
Note (2) This is based on the design value for this area during normal operation (assuming 1% failed fuel) according to ANO-1 SAR.							

(continued next page)

PROC./WORK PLAN NO. 1305.001	PROCEDURE/WORK PLAN TITLE: RADIATION MONITORING SYSTEM CHECK AND TEST	PAGE: 50 of 52 CHANGE: 017
--	---	---

SUPPLEMENT 6

Page 9 of 11

3.0 (Continued)

Monitor Indicator Number/Description	WARNING SETTING				ALARM SETTING		
	Minimum Setpoint	As-Left Setpoint	Maximum Normal Setpoint	Is As-Left Setpoint ≤ Max Normal Setpoint?	As-Left High Alarm Setpoint	Maximum High Alarm Setpoint	Is As-Left High Alarm Setpoint ≤ Max High Alarm Setpoint?
RI-8016 Spent Fuel Filters Area	1 mR/HR	N/A	48 mR/HR	YES NO	N/A	72 mR/HR	YES NO
RI-8017 Fuel Handling Equipment	0.04 R/HR		0.3 R/HR (3) Variable (4)	YES NO		0.45 R/HR (3) Variable (4,5)	YES NO
RI-8018 Personnel Access Hatch	0.04 R/HR		0.04 R/HR	YES NO		0.06 R/HR	YES NO
RI-8019 Incore Instrument Tank	0.04 R/HR		1.2 R/HR (3) Variable (4,6)	YES NO		1.8 R/HR (3) Variable (4,5)	YES NO
RI-8020 Equipment Hatch	0.04 R/HR		0.08 R/HR (3) Variable (4,6)	YES NO		0.12 R/HR (3) Variable (4,5)	YES NO
2RITS-8001A High Alarm Setpoint	N/A	N/A	N/A	N/A		800 CPM (7)	YES NO
2RITS-8001B High Alarm Setpoint	N/A	N/A	N/A	N/A		800 CPM (7)	YES NO

Note (3) Reactor critical

Note (4) Reactor shutdown

Note (5) During refueling shutdown, set the alarm sufficiently above the background reading to minimize constant alarming. If alarm setpoint must exceed 100 mR/HR, then ensure RP is notified and the area properly posted.

Note (6) Establish the background for this meter and set the warning lower than the alarm setpoint but sufficiently above the background reading to minimize constant alarming.

Note (7) Based upon 1MPC XE-133. (Calc 91-E-0067-01)

PROC./WORK PLAN NO. 1305.001	PROCEDURE/WORK PLAN TITLE: RADIATION MONITORING SYSTEM CHECK AND TEST	PAGE: 51 of 52 CHANGE: 017
---------------------------------	---	-------------------------------

SUPPLEMENT 6

Page 10 of 11

3.2 IF "No" is circled in the above tables,
THEN perform the following:

- Immediately notify the Shift Manager/CRS
- Document reason for raised background in section 4.0
- Initiate corrective actions as required

Performed By _____ Operator Date/Time _____

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 1 Date: _____TUOI NUMBER: A1JPM-RO-AOP28System/Duty Area: Emergency and Abnormal OperationsTask: Respond to Lo-Lo Instrument Air PressureJA# ANO1-RO-AOP-OFFNORM-178KA Value RO 3.7 SRO 3.9 KA Reference 065 AK3.08Approved For Administration To: RO ☒ SRO ☒Task Location: Inside CR: ☒ Outside CR: ☐ Both: ☐

Suggested Testing Environment And Method (Perform Or Simulate #): Simulator/Perform

Plant Site: _____ Simulator#: _____ Perform _____ Lab: _____

Position Evaluated: RO: _____ SRO: _____

Actual Testing Environment: Simulator #: X Plant Site: _____ Lab _____Testing Method: Simulate: _____ Perform: XApproximate Completion Time In Minutes: 10 MinutesReference(S) 1203.024, Chg. 011-00-0
:

Examinee's Name: _____ SSN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time _____ Stop Time _____ Total Time _____

Signed # _____ Date: _____

TQ-202 attachment 9 is complete and on file for performance of this JPM for the current Reactor core configuration. Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

TUOI NUMBER: A1JPM-RO-AOP28

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

- Instrument Air pressure dropping due to unisolable leak on IA main line.
- ICW RB isolation valves inadvertently closed and will not reopen.
- Plant Shutdown commenced at >10% per minute per Rapid Plant Shutdown 1203.045.
- PZR Level 285" and trending up.

TASK STANDARD:

Rx Tripped, EFW in service, Seal Injection isolated, and RCP's secured with normal and alternate seal bleed off flow paths isolated

TASK PERFORMANCE AIDS: 1203.024 Section 2

TUOI NUMBER: A1JPM-RO-AOP28

INITIATING CUE: The SM/CRS directs you to perform 1203.024 Section 2 Lo-Lo Instrument Air Pressure step 3.6 through step 3.6.6.

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
(C)	1. Manually trip Reactor, verify all rods inserted and power dropping. <u>POSITIVE CUE:</u> Depressed the Rx Trip pushbutton. All rod bottom lights on Rx power dropping	On C03, depressed the Rx Trip pushbutton. On C13, observed all rod bottom lights have come on. On C03 observed power dropping.	_____	_____	_____
	2. Manually trip the turbine and verify all throttle and governor valves closed. <u>POSITIVE CUE:</u> On C01, depressed the Turbine Trip pushbutton and verified all TVs and GV's closed	On C01, depressed the Turbine Trip pushbutton and verified all TVs and GV's closed.	_____	_____	_____
	3. Check adequate SCM. <u>POSITIVE CUE:</u> On ICC display on C19 (or C04), verified that SCM is >30 degrees F	On ICC display on C19 (or C04), verified that SCM is adequate.	_____	_____	_____
(C)	4. Actuate EFW for both OTSG's. <u>POSITIVE CUE:</u> On C09, All 4 EFW push buttons on EFIC remote matrix back light red	On C09, All 4 EFW push buttons pushed on EFIC remote matrix.	_____	_____	_____
EXAMINER NOTE IF student starts RT-5 inform him/her the CBOT will perform RT-5					
(C)	5. Isolate Seal Injection by closing CV-1206. <u>POSITIVE CUE:</u> Green lights on for CV 1206	On C04, placed HS-1206 in close position.	_____	_____	_____

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
(C)	<p>6. Trip all running RCP's.</p> <p><u>POSITIVE CUE:</u> All Four RCP's lights are green on C13</p>	On C13 tripped All running RCP's. P-32A, P-32B, P-32C, & P-32D.	_____	_____	_____
(C)	<p>7. Isolate Alternate Seal Bleed off flow path to the Quench Tank.</p> <p><u>POSITIVE CUE:</u> Green lights on for SV-1270 thru SV-1273, on C13</p>	On C13, placed SV-1270 thru SV-1273 hand switches in closed position.	_____	_____	_____
(C)	<p>8. Isolate Normal Seal Bleed off flow path.</p> <p><u>POSITIVE CUE:</u> Green lights on for CV-1274 on C16 OR Green lights on for CV-1270 thru CV-1273 on C18</p>	On C16, close CV-1274 or on C18 close CV-1270 thru CV-1273.	_____	_____	_____
<p align="center">EXAMINEER NOTE</p> <p>When Normal Seal Bleed Off is isolated inform the candidate the JPM is over.</p>					

END

TUOI NUMBER: A1JPM-RO-AOP28

JPM INITIAL TASK CONDITIONS:

- Instrument Air pressure dropping due to unisolable leak on IA main line.
- ICW RB isolation valves inadvertently closed and will not reopen.
- Plant Shutdown commenced at >10% per minute per Rapid Plant Shutdown 1203.045.
- PZR Level 285" and trending up.

INITATING CUE:

The SM/CRS directs you to perform 1203.024 Section 2 Lo-Lo Instrument Air Pressure step 3.6 through step 3.6.6.

JPM

h.

A1JPM-RO-AOP19
Loss of Decay Heat Removal

Simulator

RO

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 2 Date: _____JPM ID: A1JPM-RO-AOP19System/Duty Area: Emergency and Abnormal OperationsTask: Loss of Decay Heat Removal: Makeup using LPI Pump from BWSTJTA# ANO1-RO-AOP-OFFNORM-253KA Value RO 3.8 SRO 3.9 KA Reference: 025 AA1.02Approved For Administration To: RO X SRO XTask Location: Inside CR X Outside CR _____ Both _____

Suggested Testing Environment and Method (Perform or Simulate):

Plant Site: _____ Simulator: Perform Lab: _____

Position Evaluated: RO: _____ SRO: _____

Actual Testing Environment: Plant Site _____ Simulator X Lab _____

Testing Method: Perform _____ X _____ Simulate _____

Approximate Completion Time in Minutes: 5 MinutesReference(s): 1203.028 Loss of Decay Heat Removal Attachment B: LPI Pump from BWST

Examinee's Name: _____ SSN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time _____ Stop Time _____ Total Time _____

*Signed _____ Date _____

*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

JPM ID: A1JPM-RO-AOP19

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee (NOTE: If desired, the operators/examinees may have been briefed as a group prior to the start of this walkthrough examination per 1064.023 Attachment 6 ,Walkthrough Process, step 1.C.).

JPM INITIAL TASK CONDITIONS:

- P34A was the operating Decay Heat Removal Pump.
- P34A has been stopped and DH Suction valve CV-1050 has been closed.
- A very large RCS leak has developed inside the Reactor Building

TASK STANDARD:

P-34B LPI pump started with suction from the BWST and injecting water into the RCS at 700 – 1300 gpm.

TASK PERFORMANCE AIDS:

1203.028 Loss of Decay Heat Removal, Attachment B LPI Pump from BWST.

JPM ID: A1JPM-RO-AOP19

INITIATING CUE: The CRS/SM directs you to inject ~1000 gpm borated water into the RCS using P34B LPI Pump per Attachment B of 1203.028 (Loss of Decay Heat Removal).

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	1. Read note "LPI is effective only for RCS press <200 psig." <u>POSITIVE CUE:</u> RCS press <200 psig.	Verify RCS pressure <200 psig on C03, C04, SPDS, or ICCMDS.	—	—	—
(C)	2. Open BWST Outlet CV-1408 to LPI Pump P34B. <u>POSITIVE CUE:</u> Red light ON, green light OFF for CV-1408.	On panel C16, opened CV-1408, observed red light ON and green light OFF.	—	—	—
	3. Verify either LPI Block CV-1400 closed <u>OR</u> Decay Heat Cooler Outlet CV-1429 and Cooler Bypass CV-1432 closed. <u>POSITIVE CUE:</u> Green light ON, red light OFF for CV-1400 <u>OR</u> Green light ON, red light OFF for CV-1429 and CV-1432 demand is at zero.	Verified either LPI Block CV-1400 closed on panel C16 <u>OR</u> Decay Heat Cooler Outlet CV-1429 on C16 and Cooler Bypass CV-1432 closed on panel C14.	—	—	—
(C)	4. Start the LPI pump. EXAMINER NOTE Candidate may verify CV-1429, CV-3821, and CV-3841 position. <u>POSITIVE CUE:</u> Red light ON, green light OFF for P34B.	On panel C16, started LPI Pump P-34B.	—	—	—
(C)	5. Throttle open, as necessary, Decay Heat Cooler Outlet CV-1429 <u>or</u> LPI Block CV-1400 to achieve ~1000 gpm flow into the RCS. <u>POSITIVE CUE:</u> 1000 gpm flow indicated on LPI flow indicator FIS-1402 on C16. <u>NEGATIVE CUE:</u> No flow indicated on LPI flow indicator FIS-1402 on C16.	On panel C16, throttled open Decay Heat Cooler Outlet CV-1429 <u>or</u> LPI Block CV-1400 to achieve 700-1300 gpm flow into the RCS as indicated on FIS-1402 (C16) or FIRS-1500 (C14) or SPDS.	—	—	—
EXAMINER NOTE When LPI flow is ~1000 gpm inform candidate, "This JPM is complete."					

END

JPM ID:

A1JPM-RO-AOP19

INITIAL CONDITIONS:

- **P34A was the operating Decay Heat Removal Pump.**
- **P34A has been stopped and DH Suction valve CV-1050 has been closed.**
- **A very large RCS leak has developed inside the Reactor Building.**

INITIATING CUE:

The CRS/SM directs you to inject ~1000 gpm borated water into the RCS using P34B LPI Pump per Attachment B of 1203.028 (Loss of Decay Heat Removal).

JPM

i.

A1JPM-RO-EFW01

Reset EFW pump after overspeed
trip

In-Plant

RO / SROI / SROU

Unit: 1 Rev # 0 Date: 01/12/2004

System/Duty Area: Emergency Feedwater and EFIC

Task: Reset the Steam Driven Emergency Feedwater Pump after an over speed trip

KA Value RO	3.4	SRO	3.8	KA Reference	061 A2.04
-------------	-----	-----	-----	--------------	-----------

Approved For Administration To: RO ☒ SRO ☒

Task Location: Inside CR: ☐ Outside CR: ☒ Both: ☐

Suggested Testing Environment And Method (Perform Or Simulate): Simulate

Plant Site: Perform Simulator _____ Lab: _____

Position Evaluated: RO: X SRO: X

Actual Testing Environment: Simulator: _____ Plant Site: X Lab _____

Testing Method: Simulate: X Perform: _____

Approximate Completion Time In Minutes: 15 Minutes

Reference(S) 1106.006 Exhibit A, and Exhibit B change 078.
:

Examinee's Name: _____ SSN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time	Stop Time	Total Time
------------	-----------	------------

Signed _____ Date: _____

Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

P7A Emergency Feedwater Pump has tripped on over speed during an EFIC actuation.

TASK STANDARD:

P7A turbine has been reset per 1106.006 Exhibit A.

TASK PERFORMANCE AIDS:

OP 1106.006 Exhibit A and Exhibit B

SIMULATOR SETUP:

N/A

INITIATING CUE: The SM/CRS directs you to reset P7A overspeed trip per 1106.006, Exhibit A.

CRITICAL ELEMENTS (c): 2, 3, and 8

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EXAMINER'S NOTE: Simulate communications with the Control Room.					
	<p>1. Verify the following valves are closed. If EFW initiate signal is present, manual control is required.</p> <ul style="list-style-type: none"> • EFW Pump Turbine K3 Steam Admission Valves (CV-2613 and CV-2663) • EFW Pump Turbine K3 Steam Admission Valve Bypasses (CV-2615 and CV-2665) <p><u>POSITIVE CUE:</u> CV-2613, CV-2663, CV-2615, CV-2665 have valve stems full out with hand wheel's full CW.</p>	Called control room to verify CV-2613, CV-2663, CV-2615, CV-2665 are closed.	_____	_____	_____
C	<p>2. Turn EFW Turbine K3 Trip-Throttle Valve (CV-6601A) hand wheel clockwise. Observe rotation of screw raises sliding nut and latch lever to where it will engage the trip hook.</p> <p><u>POSITIVE CUE:</u> Trip/ Throttle valve (CV-6601A) sliding nut raised and latch lever has engaged the trip hook.</p>	Trip/ Throttle valve (CV-6601A) hand wheel turned clockwise until sliding nut rises and latch lever engages the trip hook.	_____	_____	_____
EXAMINER'S NOTE: The following steps will reset the mechanical trip linkage. Examiner may refer to Exhibit B drawing for clarification.					
C	<p>3. Pull spring-loaded connecting rod against spring force to move head lever away from tappet and tappet nut.</p> <p><u>POSITIVE CUE:</u> Head lever moved away from tappet and tappet nut.</p>	Connecting rod pulled against spring force to move head lever away from tappet and tappet nut.	_____	_____	_____
	<p>4. Lift and release tappet assembly</p> <p><u>POSITIVE CUE:</u> Tappet assembly lifted and released.</p>	Tappet assembly lifted and released.	_____	_____	_____
	<p>5. Verify tappet nut in trip reset position.</p> <p><u>POSITIVE CUE:</u> Tappet nut in trip reset position.</p>	Verified tappet nut in trip reset position.	_____	_____	_____

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	<p>6. Observe tappet returns to reset position.</p> <p><u>POSITIVE CUE:</u> Tappet is in reset position.</p>	Observed tappet returns to reset position.	—	—	—
	<p>7. Verify the following:</p> <ul style="list-style-type: none"> • Tappet nut in trip reset position and properly aligned. • Spring tension holds connecting rod in position. <p><u>POSITIVE CUE:</u> Tappet nut in trip reset position and properly aligned. Spring tension is holding connecting rod in position.</p>	Verified tappet nut in trip reset position and properly aligned. Verified spring tension holds connecting rod in position.	—	—	—
C	<p>8. Slowly turn CV-6601A hand wheel counterclockwise until valve is fully open.</p> <p><u>POSITIVE CUE:</u> CV-6601A has valve stem full out with hand wheel in the full CW position.</p>	CV-6601A fully opened.	—	—	—
	<p>9. Close valve (CV-6601A) 3/4 turn to prevent binding on heatup.</p> <p><u>POSITIVE CUE:</u> CV-6601A as you see it.</p>	CV-6601A closed 3/4 turn.	—	—	—
EXAMINER'S NOTE: Simulate communications with the Control Room.					
	<p>10. Verify P-7A TURBINE TRIP (K12-B5) clear.</p> <p><u>POSITIVE CUE:</u> P-7A TURBINE TRIP (K12-B5) clear</p>	Call Control Room and verified that P-7A TURBINE TRIP (K12-B5) is clear.	—	—	—
	<p>11. Notify Control Room that P-7A is ready for restart.</p> <p><u>POSITIVE CUE:</u> Control Room notified that P-7A is ready for restart.</p>	Control Room notified that P-7A is ready for restart.	—	—	—
EXAMINER'S CUE: This concludes the JPM.					

END

EXAMINEE'S COPY

INITIAL CONDITIONS:

P7A Emergency Feedwater Pump has tripped on over speed during an EFIC actuation.

INITIATING CUE:

The SM/CRS directs you to reset P7A over speed trip per 1106.006, Exhibit A.

**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

TITLE: EMERGENCY FEEDWATER PUMP OPERATION SET #	DOCUMENT NO. 1106.006	CHANGE NO. 078
	WORK PLAN EXP. DATE N/A	
	SAFETY-RELATED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	IPTE <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
	TEMP MOD <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	LEVEL OF USE <input checked="" type="checkbox"/> CONTINUOUS <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

When you see these TRAPS

Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)

Get these TOOLS

Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover

VERIFIED BY	DATE	TIME
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

FORM TITLE: VERIFICATION COVER SHEET	FORM NO. 1000.006A	CHANGE NO. 054
--	-----------------------	-------------------

PROC./WORK PLAN NO. 1106.006	PROCEDURE/WORK PLAN TITLE: EMERGENCY FEEDWATER PUMP OPERATION	PAGE: 83 of 217 CHANGE: 078
--	---	--

1106.006

04/25/07

EXHIBIT A

Page 1 of 2

EMERGENCY FEEDWATER PUMP P-7A OVERSPEED TRIP RESET

1.0 Verify the following valves are closed:

1.1 IF EFW initiate signal is present,
THEN manual control is required:

- EFW Pump Turbine K3 Steam Admission Valve (CV-2613)
- EFW Pump Turbine K3 Steam Admission Valve (CV-2663)
- EFW Pump Turbine K3 Steam Admission Valve Bypass (CV-2615)
- EFW Pump Turbine K3 Steam Admission Valve Bypass (CV-2665)

2.0 Turn EFW Turbine K3 Trip/Throttle Valve (CV-6601A) handwheel clockwise.

2.1 Observe rotation of screw raises sliding nut and latch lever to where it will engage the trip hook.

3.0 Manually reset mechanical trip linkage as follows:

3.1 Pull spring-loaded connecting rod against spring force to move head lever away from tappet and tappet nut.

3.2 Lift and release tappet assembly.

3.2.1 Observe tappet returns to reset position.

CAUTION

If necessary to manually push tappet down into position, force must be applied straight downward to prevent bending aluminum tappet.

3.2.2 IF tappet spring force did not move tappet into proper position,
THEN manually press tappet straight downward into position.

3.2.3 IF it was necessary to manually reposition tappet,
THEN notify CRS,
AND upon completion verify Condition Report initiated.

PROC./WORK PLAN NO. 1106.006	PROCEDURE/WORK PLAN TITLE: EMERGENCY FEEDWATER PUMP OPERATION	PAGE: 84 of 217 CHANGE: 078
--	---	--

1106.006

04/25/07

EXHIBIT A

Page 2 of 2

EMERGENCY FEEDWATER PUMP P-7A OVERSPEED TRIP RESET

NOTE

Flat side of tappet nut must be aligned to the flat of the head lever (parallel to shaft). Otherwise latch lever and trip hook can disengage when CV-6601A is opened.

3.3 Verify the following:

- A. Tappet nut in trip reset position AND properly aligned.
- B. Spring tension holds connecting rod in position.

NOTE

- Steam pressure trapped between Steam Admission Valves and CV-6601A will be admitted to turbine when CV-6601A is opened and may result in turbine rotation.
- CV-6601A must indicate open to clear overspeed trip alarm.

3.4 Slowly turn CV-6601A handwheel counterclockwise until valve is fully open.

3.4.1 Close valve 3/4 turn to prevent binding on heatup.

3.4.2 Verify P-7A TURBINE TRIP (K12-B5) clear.

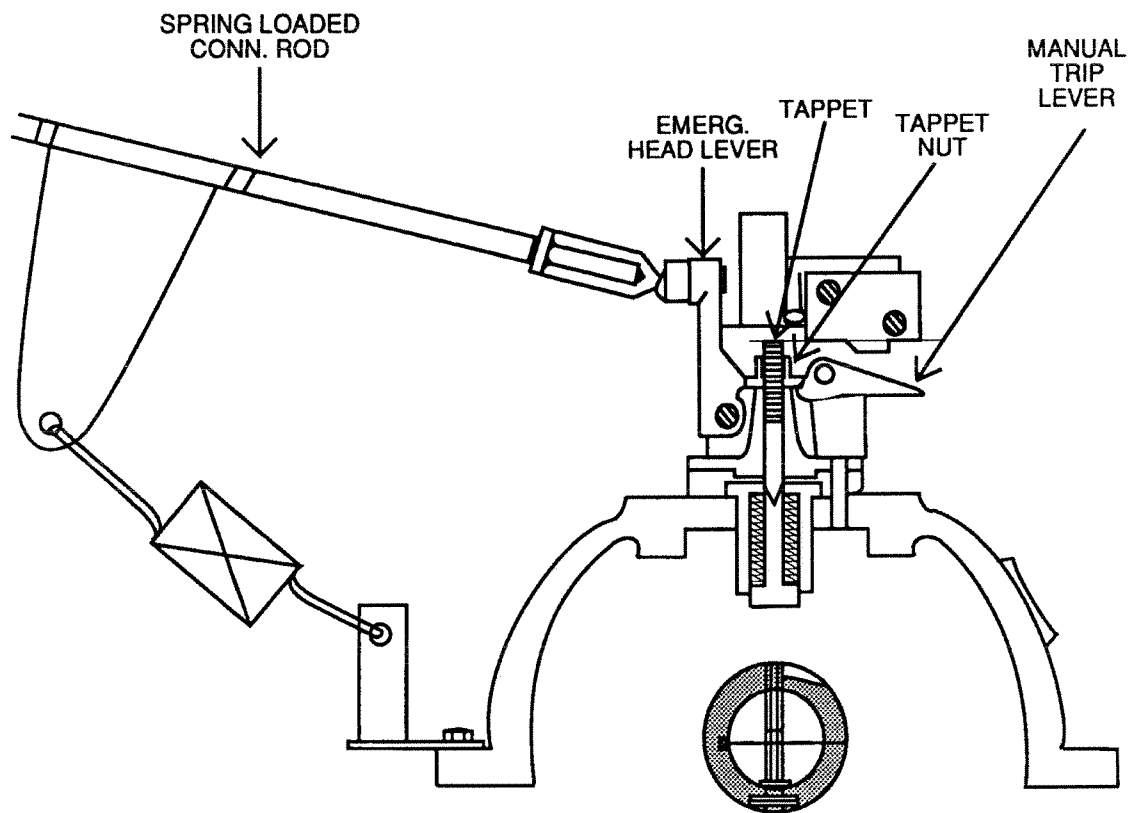
4.0 Notify Control Room that P-7A is ready for restart.

PROC./WORK PLAN NO. 1106.006	PROCEDURE/WORK PLAN TITLE: EMERGENCY FEEDWATER PUMP OPERATION	PAGE: 85 of 217 CHANGE: 078
---------------------------------	--	--------------------------------

07/18/00

**1106.006
EXHIBIT B**

**EMERGENCY FEEDWATER PUMP P-7A
OVERSPEED TRIP MECHANISM**



JPM

j.

A1JPM-RO-EDO30

**Place battery charger D-03B in
service**

In-Plant

RO / SROI / SROU

JOB PERFORMANCE MEASURE

Page 1 of 6

TUOI: A1JPM-RO-ED030

UNIT: 1 REV # 2 DATE: _____

TUOI NUMBER: A1JPM-RO-ED030

SYSTEM/DUTY AREA: BATTERY AND 125V DC DISTRIBUTION

TASK: PLACE BATTERY CHARGER D-03B IN SERVICE

JTA#: ANO1-AO-125DC-NORM-12

KA VALUE RO: 4.4 SRO: 4.0 KA REFERENCE: 2.1.30

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: _____ OUTSIDE CR: X BOTH: _____

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: X SIMULATOR: _____ LAB: _____

POSITION EVALUATED: RO: X SRO: X

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: X LAB: _____

TESTING METHOD: SIMULATE: X PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 20 MINUTES

REFERENCE(S): 1107.004, Chg. 016

EXAMINEE'S NAME: _____ SSN _____ - _____ - _____

EVALUATOR'S NAME: _____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS
CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____ UNSATISFACTORY: _____

PERFORMANCE CHECKLIST COMMENTS:

_____ Start Time _____ Stop Time _____ Total Time

SIGNED _____ DATE: _____

SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY A
QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

JOB PERFORMANCE MEASURE

Page 2 of 6

TUOI: A1JPM-RO-ED030

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

Battery Charger D-03A is in service on Battery D01.

TASK STANDARD: IAW 1107.004, Att. B, examinee places charger D-03B in service, removes D-03A from service, and performs actions for D-03A DC output voltage drifting to zero.

THIS IS AN ALTERNATE SUCCESS PATH JPM.

TASK PERFORMANCE AIDS: 1107.0004 Attachment B

JOB PERFORMANCE MEASURE

TUOI: A1JPM-RO-ED030

Page 3 of 6

INITIATING CUE:

The Shift Manager directs you to place Battery Charger D-03B in service on Bus D01 and remove Battery Charger D-03A from service per 1107.004, Battery and 125V DC Distribution, Attachment B.

CRITICAL ELEMENTS (C) 5, 6, 8, 9, 12, 15, 17

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Verify breakers open for charger D-03B. <ul style="list-style-type: none"> AC Input breaker (B301) DC Output breaker (B302) <u>POSITIVE CUE:</u> B301 and B302 breaker handles are down	On front of charger D-03B, verified the AC Input (B301) and DC Output breakers (B302) open (OFF).	_____	_____	_____
	2. Verify AC feeder breaker to charger D-03B closed (B-5733). <u>POSITIVE CUE:</u> B-5733 breaker handle is up	Verified breaker B-5733 closed (ON).	_____	_____	_____
EXAMINER NOTE In the following step, Caution the examinee, "Do not to break plane of cubicle door."					
	3. Verify charger D-03B supply to bus breaker closed (D01-42). <u>POSITIVE CUE:</u> D-03B supply to bus breaker (D01-42) handle is up	Inside panel D01, verified breaker D01-42 closed (ON).	_____	_____	_____
	4. Verify Manual Disconnect for battery D-07 closed (D-13). <u>POSITIVE CUE:</u> Manual Disconnect for battery D-07 D-13 breaker handle is up	At D13, verified manual disconnect for battery D07 closed (ON).	_____	_____	_____
(C)	5. Close D-03B AC Input breaker.B301. <u>POSITIVE CUE:</u> D-03B AC Input breaker B301 handle is up	On front of charger D-03B, closed the AC Input breaker (ON).	_____	_____	_____
(C)	6. Close D-03B DC Output breaker.B302. <u>POSITIVE CUE:</u> D-03B DC Output breaker B302 handle is up	On front of charger D-03B, closed the DC Output breaker (ON).	_____	_____	_____

JOB PERFORMANCE MEASURE

TUOI: A1JPM-RO-ED030

Page 4 of 6

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	<p>7. Wait ~1 minute for automatic load sharing to occur.</p> <p><u>POSITIVE CUE:</u> Amps are rising on D-03B output ammeter and amps are falling on D-03A output ammeter.</p> <p>After ~5 seconds inform candidate, "Amps have stabilized."</p>	Waited ~1 minute, observed rising amps on D-03B and falling amps on D-03A. Student should point out meters he or she is watching	_____	_____	_____
(C)	<p>8. Open D-03A DC Output breaker B302.</p> <p><u>POSITIVE CUE:</u> D-03A DC Output breaker B302 handle is down</p>	On front of charger D-03A, opened the DC Output breaker (OFF).	_____	_____	_____
(C)	<p>9. Open D-03A AC Input breaker B301.</p> <p><u>POSITIVE CUE:</u> D-03A AC Input breaker B301 handle is down</p>	On front of charger D-03A, opened the AC Input breaker (OFF).	_____	_____	_____
	<p>10. Check Charger D-03B picks up load.</p> <p><u>POSITIVE CUE:</u></p> <ul style="list-style-type: none"> D-03B DC Out ~100 amps D01 bus voltage 130V 	At charger D-03B checked ammeter deflected to a nominal value, and at D01 checked bus voltage maintained at ~130 volts.	_____	_____	_____
<p align="center">EXAMINER NOTE</p> <p>If asked state, "No alarms are in on the alarm panel."</p>					
	<p>11. Reset local alarm panel for Charger D-03B. (K1651)</p> <p><u>POSITIVE CUE:</u> Alarm panel lights are off</p>	At charger D-03B, pressed "R" button on RIS panel.	_____	_____	_____
(C)	<p>12. Place D-03B alarm to control room toggle switch ON.</p> <p><u>POSITIVE CUE</u> Toggle switch in the up position</p>	At charger D-03B, placed control room alarm switch to ON (up).	_____	_____	_____

JOB PERFORMANCE MEASURE

TUOI: A1JPM-RO-ED030

Page 5 of 6

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	13. Place D-03A alarm to control room toggle switch OFF. <u>POSITIVE CUE</u> Toggle switch in the down position	At charger D-03A, placed control room alarm switch to OFF (down).	_____	_____	_____
	14. Check annunciator D01 CHARGER TROUBLE (K01-E7) clears. <u>POSITIVE CUE</u> Control Room reports K01-E7 alarm cleared	Called control room and requested check for clear annunciator K01-E7.	_____	_____	_____
EXAMER NOTE ALTERNATE PATH CUE: Inform examinee that, "D-03A DC Output Voltage drifted to zero, one minute has passed since D-03A was de-energized."					
(C)	15. Close D-03A AC Input breaker B301. <u>POSITIVE CUE</u> D-03A AC Input B301 breaker handle is up	On front of charger D-03A, closed the AC Input breaker (ON).	_____	_____	_____
	16. Check D-03A DC output voltage and AC input voltage. <u>POSITIVE CUE</u> <ul style="list-style-type: none"> DC Output Voltage ~90V AC Input Voltage ~480V 	On charger D-03A, observed DC output voltage and AC input voltage meters. Examinee stated that he would contact electrical maintenance for support.	_____	_____	_____
(C)	17. Open D-03A AC Input breaker B301. <u>POSITIVE CUE</u> D-03A AC Input B301 breaker handle is down	On front of charger D-03A, opened the AC Input breaker (OFF).	_____	_____	_____
	18. Contact Electrical for support Submit condition report and WR and Condition report initiated.	Examinee stated that he would submit a condition report and Work Request or Work Order on D-03A.	_____	_____	_____
When candidate states need to contact Electrical inform candidate, "JPM is complete."					

END

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

Battery Charger D-03A is in service on Bus D01.

INITIATING CUE:

The Shift Manager directs you to place Battery Charger D-03B in service on Bus D01 and remove Battery Charger D-03A from service per 1107.004, Battery and 125V DC Distribution, Attachment B.

JPM

k.

A1JPM-RO-LRW01
Liquid Radiation waste release

In-Plant

RO / SROI

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 2 Date: _____JPM ID: A1JPM-RO-LRW01System/Duty Area: Radioactivity ReleaseTask: Perform Liquid Radiation Release of T-16A TWMTJTA# ANO1-RO-CZ-NORM-11KA Value RO 3.8 SRO 4.3 KA Reference 2.3.11Approved For Administration To: RO X SRO XTask Location: Inside CR: _____ Outside CR: X Both: _____

Suggested Testing Environment And Method (Perform or Simulate):

Plant Site: X Simulator: Perform Lab: _____

Position Evaluated: RO: _____ SRO: _____

Actual Testing Environment: Simulator: _____ Plant Site: X Lab: _____Testing Method: Simulate: X Perform: _____Approximate Completion Time In Minutes: 10 MinutesReference(s): OP-1104.020 Clean Waste System Operation Change 049

Examinee's Name: _____ KCN: _____

Evaluator's Name: _____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: _____ Unsatisfactory: _____

Performance Checklist Comments:

Start Time _____ Stop Time _____ Total Time _____

*Signed _____ Date: _____

*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

JPM ID: A1JPM-RO-LRW01

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

RX 100%

Treated Waste Monitor Tank (TWMT) T-16A Liquid Release Permit completed through Step 3.6

TASK STANDARD:

Commence T-16A TWMT Release per Step 4.0

This is an Alternate Success Path JPM.

TASK PERFORMANCE AIDS: NONE

Suggested Simulator setup:

N/A

JPM ID: A1JPM-RO-LRW01

INITIATING CUE: The SM/CRS directs you to commence a T-16A TWMT release per Step 4.0 of OP-1104.020.

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	1. Verify CZ Disch to Flume Flow (CV-4642) closed. <u>POSITIVE CUE:</u> CV-4642 closed (green light On)	Verify CZ Disch to Flume Flow (CV-4642) closed.	—	—	—
	2. Verify T-16A X-fer Pump (P-47A) stopped <u>POSITIVE CUE:</u> P-47A stopped. (green light on control switch)	Verify T-16A X-fer Pump (P-47A) stopped.	—	—	—
	3. Verify Treated Waste Monitor Tank T-16A Inlet (CZ-47A) closed <u>POSITIVE CUE:</u> Valve stem fully inserted into valve body. Treated Waste Monitor Tank T-16A Inlet (CZ-47A) verified closed by holding chain and moving the valve hand wheel in the closed direction	Verify Treated Waste Monitor Tank T-16A Inlet (CZ-47A) closed.	—	—	—
	4. Verify Treated Waste Monitor Tank T-16A Inlet (CZ-47A) tagged. <u>FAULTED CUE:</u> Treated Waste Monitor Tank T-16A Inlet (CZ-47A) TAG IS MISSING.	Verify Treated Waste Monitor Tank T-16A Inlet (CZ-47A) is tagged.	—	—	—
C	5. Terminate release.	Operator recognizes requirement and does not proceed with the release.	—	—	—
<p style="text-align: center;">EXAMINER NOTE</p> <p>Once operator recognizes the release process cannot continue inform the candidate, “This JPM is complete.”</p>					

END

JPM ID: A1JPM-RO-LRW01

INITIAL CONDITIONS:

RX 100%

**Treated Waste Monitor Tank (TWMT) T-16A Liquid Release
Permit completed through Step 3.6**

INITIATING CUE:

**The SM/CRS directs you to commence a T-16A TWMT release
per Step 4.0 of OP-1104.020.**

Facility: ANO-1

Scenario No.: 1-R2

Op-Test No.: 2010-1

Examiners: _____ Operators: _____

Initial Conditions:

- Recall 30% IC
- C28A IA compressor is out of service for overhaul.
- EFIC failed (IMF FW621)
- A1/2 and H1/2 powered from Unit Aux transformer
- A2 and H1/2 SU2 handswitches in P-T-L
- Caution tag P26B, P27B, P28B, 'B' MFP turning gear

Turnover:

- 30% Power (Power reduced for TV/GV testing)
- Rod index ~182% with equilibrium Xenon
- RCS boron 680 ppm
- 'A' MFP I/S
- 'B' MFP repairs in progress
- C28A IA compressor is out of service for overhaul.
- Perform add N2 to 'B' CFT to ~585# per 1104.001 step 11.0.
- Escalate power to ~35% following N2 add and hold till 'B' MFP available per 1102.004 Power Operations step 7.5. (Procedure in progress)

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-(SRO) N-(BOP)	Add N2 to 'B' CFT to raise pressure to ~585#
2	N/A	R-(ATC) N-(SRO) N-(BOP)	Following N2 add commence raising power to ~35%
3	TR458	I-(ATC) I-(SRO)	'A' RCS Pressure transmitter PT-1021 fails low (TS)
4	SW121	C-(SRO) C-(BOP)	SW pump P4A bearing heatup and trip
5	DO_K2AA DO_K2AW K06F2	C-(SRO)	'A' MFP oil reservoir leak
6	FW074	C-(ALL)	'A' MFP loss of lube oil and trip

SCENARIO OUTLINE CONTINUED

Facility: ANO-1		Scenario No.: 1-R2		Op-Test No.: 2010-1	
Scenario Outline Continued					
Event No.	Malf. No.	Event Type*	Event Description		
7	FW621	C-(ATC) C-(SRO)	EFIC fails to actuate (TS) (ATC-CT)		
8	N/A	M-(ALL)	RX trip		
9	MS134	M-(ALL)	'B' SG steam leak in pent house up stream of the MSIV (ATC-CT) (CBO-CT)		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Scenario #1-R2 Objectives

- 1) Evaluate individual ability to add N2 to the CFT per 1104.001 step 11.0.
- 2) Evaluate individual ability to raise RX power with ICS in automatic.
- 3) Evaluate individual ability to recognize and respond to 'A' RCS Pressure transmitter PT-1021 fails low.
- 4) Evaluate individual ability to recognize and respond to a SW pump bearing heatup and trip.
- 5) Evaluate individual ability to swap operating SW pumps.
- 6) Evaluate individual ability to recognize and respond to an oil leak from the 'A' MFP oil reservoir.
- 7) Evaluate individual ability to recognize and respond to the loss of all feedwater and the need to trip the reactor.
- 8) Evaluate individual ability to recognize and respond to EFIC failing to actuate EFW.
- 9) Evaluate individual ability to recognize and respond to a main steam line rupture upstream of the MSIV and outside the reactor building.

SCENARIO #1-R2 NARRATIVE

The crew will assume responsibility for the plant at ~30% power. Power is low following TV/GV testing and awaiting thrust bearing repairs to the 'B' MFP. The MFP is expected back later today. The plant has been at 30% for 2 days and xenon is at equilibrium. C28A IA compressor is OOS for motor cleaning and is not expected back till 8pm today.

The crew will be allowed time to brief adding N2 to the 'B' CFT and raising power to ~35% prior to entering the control room. Power Operations procedure will be in progress. Rx engineering direction is to use control rods to raise power.

The CRS will direct adding N2 to the 'B' CFT as soon as they have responsibility for the plant. The CBO will perform 1104.001 Core Flood System Operating Procedure to raise CFT pressure ~10 psig.

As soon as the CFT pressure is raised the CRS should direct the power escalation. The ATC will use the ULD and raise to ~315 Mwe at $\leq 30\%/Hr$.

At ~35% power controlling RCS pressure transmitter PT-1021 will fail low resulting in a SASS mismatch and RCS low pressure alarms. All PZR heaters will fail on and the Spray Valve will remain closed. The CRS will use 1203.012F for SASS Mismatch and direct the 'Y' instrument be selected for control.

(TS) LCO 3.3.1.A Four channels of RPS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

The 'A' SW pump bearing will overheat bring in K10-C4 SW PUMP BRG WDG TEMP HI. The CRS will enter 1203.012I ANNUNCIATOR K10 CORRECTIVE ACTION and direct starting the 'B' SW pump. The 'A' SW pump may trip before the standby pump is started.

The 'A' MFP lube oil system will develop a leak on the common pump discharge piping. Alarm K06-F2 T34 A/B LEVEL HI/LO will occur and the CRS should reference 1202.012E ANNUNCIATOR K06 CORRECTIVE ACTION. The AO will report the leak is quite large. The pump will trip ~2 minutes after the initial alarm on loss of lube oil or prior to the crew manually tripping the RX. The crew may elect to manually trip the RX and the MFP.

After the RX trip the crew should recognize EFIC failure to actuate EFW upon the second MFP trip. The ATC should manually actuate EFW **(ATC-CT) (TS)**.

(CT-EFW should be actuated before RCS That reaches 580°F)

A main steam line leak will occur in the pent house upstream of the MSIV. The CRS should direct operation per the overcooling EOP. The crew should manually actuate MSLI to stop the overcooling. Once over cooling is terminated the crew should stabilize RCS temperature and pressure. **(ANY-CT)**

(CT-MSLI should be actuated before RCS temperature reaches 430°F)

(TS) LCO 3.3.11 The EFIC System instrumentation channels for each function in Table 3.3.11-1 shall be OPERABLE:

- **Loss of MFW Pumps**
- **SG Pressure - Low**

(TS) LCO 3.3.13 Trains A and B of each Logic Function shown below shall be OPERABLE:

- a. Main Steam Line Isolation; and**
- b. Emergency Feedwater (EFW) Initiation.**

The scenario can be terminated when RCS pressure and temperature are stabilized.

Simulator Instructions for Scenario 1-R2				
Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description
Recall 30% IC <ul style="list-style-type: none"> Recall 30% IC C28A IA compressor is out of service for overhaul EFIC failed (IMF FW621) A1/2 and H1/2 powered from Unit Aux transformer A2 and H1/2 SU2 handswitches in P-T-L Caution tag P26B, P27B, P28B, 'B' MFP turning gear 				
1	0	IRF N2_5 (T1)	0.08	Add N2 to 'B' CFT per 1104.001
2	T~10	N/A	N/A	Following N2 add commence raising power to ~35%
3	T~20	IMF TR458 (T2)	1700 20	'A' RCS Pressure transmitter PT-1021 fails low (TS)
4	T~30	IMF SW121 (T3)	N/A	SW pump bearing heatup and trip (TS)
5	T~40	IOR DO_K2AR (T4) IOR DO_K2AW (T4) IRF K06F2 (T4)	ON OFF ON	'A' MFP oil reservoir leak
6	T~42 OR Prior to Man RX trip	IMF FW074 (T5)	N/A	'A' MFP loss of lube oil and trip
7	IC	IMF FW621	N/A	EFIC fails to actuate (TS) (ATC-CT)
8	N/A	N/A	N/A	RX trip
9	50	MS134 (T6)	.7	Main steam line break (ATC-CT)

Op-Test No.: 2010-1			Scenario No.: 1-R2			Event No.: 1		
Event Description: Add N2 to 'B' CFT per 1104.001								
Time / Comments		Position		Applicant's Actions or Behavior				
0		CBOT		Verify both Core Flood Tanks (T-2A and T-2B) are filled and borated as required for operation.				
		CBOT		Check CFTs at or below normal operating pressure.				
		ANY		Verify Core Flood system aligned per System Alignment Verification section of 1015.001, Conduct of Operations. (Completed already)				
		ANY		Verify High Pressure Nitrogen aligned per Exhibit A "Nitrogen Manifold Preparations" of 1104.009. (Completed already)				
		CBOT		Direct AO to open High Pressure Nitrogen Supply Header Isol (N2-2).				
EXAMINER NOTE								
AO will report, "N2-2 High Pressure nitrogen supply header isolation is open"								
		ANY		Station a dedicated individual at N2-5 (or low-dose area 354' elevation U1 Aux Bldg) with direct communication with the Control Room, to remain in area while N2-5 is open.				
		CRS		Make appropriate entry in Category E/Locked Component Log (E-DOC 1015.001H).				
		CBOT		Direct WCO to unlock AND open High Pressure Nitrogen Supply to CFT T-2B (N2-5). Trigger 1				
		CBOT		WHEN T-2B is between 580 and 620 psig, THEN close AND lock N2-5. A. Secure dedicated individual.				
		CBOT		Direct AO to Close N2-2.				
		ANY		Direct performance of independent verification AND make appropriate entries in Category E/Locked Component Log (E-DOC 1015.001H).				
		CBOT		Direct AO to secure High Pressure Nitrogen per Exhibit A "Nitrogen Manifold Operations" of 1104.009.				
EXAMINER NOTE								
This event is complete when 'B' CFT pressure is raised and procedure is complete OR as directed by the Lead Evaluator.								

Op-Test No.: 2010-1

Scenario No.: 1-R2

Event No.: 2

Event Description: **Raise power to ~35%**

Time / Comments	Position	Applicant's Actions or Behavior
EXAMINER NOTE If crew delays power escalation then call as SM and state, "Dispatcher is in need of the power so commence the power escalation."		
10	CRS	Direct Power Escalation per 1102.004 Power Operations commencing at step 7.5.
	CRS	Determine maximum rate of escalation and required power level hold points per Attachment L, "Reactor Maneuvering Limits". Determine $\leq 30\%/Hr$ is the maximum rate.
	ATC	CBOR compare rod index with a copy of the applicable page of the COLR Regulating Rod Insertion Limits ~ every 15 minutes to verify limits are not exceeded.
	CRS	Provide the control board operator a copy of the applicable page of the COLR Axial Power Imbalance Setpoints For Full In-Core Conditions to verify limits are not exceeded.
	ATC	Observe Reactor Maneuvering limits of Attachment L.
	ANY	Reference Attachments D through J as needed for information concerning expected plant parameters.
	CBOT	Maintain generator H2 pressure and reactive loading within OPS Log Posting AB (CBO Turbine Generator Checks).
	ATC	Monitor both Gamma Metrics Linear Power indications on SPDS (NI1LP and NI2LP). A. Verify MFW flow is $>0.90 \times 10^6$ lbm/hr prior to Gamma Metrics Linear Power rising above 45% power.
	ATC	Monitor Heat Balance power on plant computer point XPP. • Compare Heat Balance power with nuclear instrumentation.
EXAMINERS NOTE If asked Chemistry will report, "SG chemistry meets the requirements of Steam Generator Water Chemistry Monitoring -- Unit One (1000.042)." Some steps may be performed after the plant is stable based upon time consideration.		
	ATC	Stop power escalation at ~35%.
EXAMINER NOTE This event is complete when ~5% power change is observed OR as directed by the Lead Evaluator.		

Op-Test No.: 2010-1

Scenario No.: 1-R2

Event No.: 3

Event Description: 'A' RCS Pressure transmitter PT-1021 fails low

Time / Comments	Position	Applicant's Actions or Behavior
20	ANY	Recognize and report SASS mismatch and RCS Low Pressure alarm.
	CRS	Direct operations per 1203.012F K07-B4 SASS Mismatch ACA and/or 1203.012H K09-C1 RCS Pressure Hi/Lo.
	ATC	Observe SASS indicating lights on C03, C04, and C13 and determine that a transfer has not occurred.
	CBO	Observe the non-selected input on the plant computer for mismatch indication.
	ANY	Perform the following to select another signal: A. Signal to be selected should be verified as a usable signal. B. Signal to be selected should be compared with existing controlling signal. C. IF signal transfer will NOT cause a system transient, THEN make selection.
	CRS	Initiate corrective action for repair.
	CRS	Direct the Mismatch Alarm Bypass switch in C47-2 for the failed component in ON.
	CRS	CRS may reference TS 3.3.1.A Four channels of RPS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.
EXAMINER NOTE This event is complete when the 'Y' instrument is selected and RCS pressure is under control OR As directed by the Lead Evaluator		

Op-Test No.: 2010-1		Scenario No.: 1-R2	Event No.: 4
Event Description: SW pump P4A bearing heatup and trip			
Time / Comments	Position	Applicant's Actions or Behavior	
30	ANY	Recognize and report K10-B4 SW PUMP BRG WDG TEMP HI	
	CBO	Determine which point is in alarm from Heater Drain, Condensate, Circulating and Service Water Pumps Motor Bearing Temperatures (TR-3651).	
	CRS	Direct operation per 1203.012I ANNUNCIATOR K10 CORRECTIVE ACTION	
	ANY	Direct AO to visually inspect affected pump.	
<p align="center">EXAMINER NOTE</p> <p>2 minutes after being dispatched; the AO will report, "P4A SW pump motor is very hot to the touch."</p> <p>The SW P4A pump may trip before the standby pump is started. If this occurs the crew should continue and start P4B SW pump.</p>			
	CBO	IF P4A is the affected pump AND CRS/SM directs securing P4A AND P4B is the standby pump, THEN perform the following to start P4B: A. Verify P4B Bus Select MOD Control switch is selected to Bus A3. B. Verify P4B MOD closed on bus A3. C. Verify P4A to P4B Crossties (CV-3644 and CV-3646) are open. D. Start P4B from C18.	
	ANY	E. Communicate with AO to verify P-4A stopped.	
	CBO	Crew may choose to green flag P4A SW pump to allow SW pump trip alarm to function.	
<p align="center">EXAMINER NOTE</p> <p>AO will report, "P4A is stopped"</p>			
<p align="center">EXAMINER NOTE</p> <p align="center">This event is complete when the standby SW pump is started OR As directed by the Lead Evaluator</p>			

Op-Test No.: 2010-1

Scenario No.: 1-R2

Event No.: 5

Event Description: 'A' MFP oil reservoir leak

EXAMINEER NOTE

The 'A' MFP must be tripped by the simulator operator within two minutes OR prior to the crew tripping the reactor.

Time / Comments	Position	Applicant's Actions or Behavior
40	ANY	Recognize and report K06-F2 T34 A/B LEVEL HI/LO.
	CRS	Direct operations per 1203.012E ANNUNCIATOR K06 CORRECTIVE ACTION.
	ANY	Determine the 'A' MFP lube oil reservoir is in alarm by checking indicating lights on C02 OR checking one of the following indicators locally at the tank.
	ANY	Dispatch AO to 'A' MFP lube oil reservoir.
EXAMINERS NOTE 1 minute after being dispatched the AO will report "The leak is on the flange of the lube oil supply header to the 'A' MFW pump. The leak is about 5 gallons a minute and cannot be isolated. T-34A level is 5.25" and lowering slowly."		
	CRS	Direct AO to add oil from Lube Oil Storage Tank (T-26) per Turbine Lube Oil Transfer and Conditioning (1106.001). A. Initiate steps to determine cause of low level.
EXAMINERS NOTE The crew may decide to trip the reactor and the 'A' MFP.		
EXAMINER NOTE This event is complete when the crew trips the reactor or the next event is initiated. OR As directed by the Lead Evaluator		

Op-Test No.: 2010-1			Scenario No.: 1-R2			Event No.: 6, 7 & 8		
Event Description: 'A' MFP loss of lube oil and trip EFIC fails to actuate EFW RX trip								
Time / Comments		Position	Applicant's Actions or Behavior					
42 OR Before crew trips RX		ANY	Recognize 'A' MFP trip and RX trip					
		CRS	Direct operations per 1202.001 RX Trip EOP. Direct Operators to perform their IA actions.					
		ATC	Manually Trip Rx. A. Verify all rods inserted AND Reactor power dropping.					
		CBO	Manually trip Turbine. A. Verify Turbine throttle and governor valves closed.					
		ANY	Check adequate SCM.					
		CRS	Advise Shift Manager to implement Emergency Action Level Classification (1903.010).					
		ATC	Reduce Letdown by closing Orifice Bypass (CV-1223).					
		CBO	Open BWST Outlet to OP HPI pump (CV-1407 or 1408).					
		ANY	Adjust Pressurizer Level Control setpoint to 100".					
		ATC	IF PZR level drops below 55", THEN verify Pressurizer Heaters off.					
		CBO	IF PZR level drops below 30", THEN initiate HPI (RT 2). (CT-CBO)					
		CBO	Check for proper electrical response.					
		ANY	Check OP HPI pump supplying normal Makeup and Seal Injection.					
		ANY	Recognize and report EFIC failed to automatically actuate.					
		ATC	Manually Actuate EFW and perform RT-5. (CT-ATC)					
		ANY	Check both SG levels remain ≤ 410 ".					

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 1-R2

Event No.: 6, 7 & 8
CONTINUEDEvent Description: **'A' MFP loss of lube oil and trip**
EFIC fails to actuate EFW
RX trip

Time / Comments	Position	Applicant's Actions or Behavior
	ANY	Check Instrument Air Header press > 75 psig.
	ANY	Check all NNI power available
	ANY	Check all ICS power available.
	ANY	Check SG press \geq 900 psig.
	ANY	Crew may place 'A' MFP lube oil pumps in P-T-L. P26A, P27A, P28A.
EXAMINER NOTE This event is complete when RCS temperature and pressure are under control OR As directed by the Lead Evaluator		

Op-Test No.: 2010-1

Scenario No.: 1-R2

Event No.: 9

Event Description: **Steam leak from 'B' SG in pent house upstream of the MSIV**

Time / Comments	Position	Applicant's Actions or Behavior
50	ANY	Recognize and report 'B' SG pressure lowering.
EXAMINER NOTE If AO is dispatched to pent House to look for a steam leak wait 1 minute and report, "Steam is blowing out around the door to the pent house and it is too dangerous to enter."		
	CRS	Direct operations per 1202.003, OVERCOOLING" procedure.
	ANY	Check adequate SCM.
	CBO	Open BWST Outlet to OP HPI pump (CV-1407 or 1408). (May already be open)
	ATC	Check Pressurizer Level Control valve operates AND maintains PZR level $\geq 55"$ (CV-1235).
	CBO	Isolate Letdown by closing Letdown Coolers Outlet (CV-1221).
	ATC	IF PZR level drops below $55"$, THEN verify Pressurizer Heaters off.
	CBO	IF PZR level drops below $30"$, THEN initiate HPI (RT 2). (CT-CBO)
	ATC	Check RCS press remains ≥ 1700 psig.
	ATC	Check RCS T-cold $\geq 430^{\circ}\text{F}$.
	ATC	Control RCS press within limits of Figure 3 (RT 14).
	ANY	Check ESAS actuation alarms clear on K11.
	ANY	Check MSSV OPEN alarm clear (K07-C5).
	ANY	IF MSSV fails to reseal AND overcooling is still in progress, THEN isolate bad SG and allow to boil dry as follows: Place bad SG EFW ISOL valves in MANUAL AND verify closed (modulating valves): CV-2620 and CV-2626.
	ANY	Actuate MSLI for bad SG AND verify proper actuation and control (RT 6). (ANY-CT)
	CRS	IF overcooling is terminated, THEN GO TO step 25.
	ATC	WHEN overcooling is terminated, THEN perform the following for each SG: A. IF MSIV is open, THEN operate TURB BYP valves as necessary to prevent RCS heatup.

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 1-R2

Event No.: 9
CONTINUEDEvent Description: **Steam leak from 'B' SG in pent house upstream of the MSIV**

Time / Comments	Position	Applicant's Actions or Behavior
	ANY	Place TURB BYP valve for SG(s) with closed MSIV in HAND AND close to prevent loss of condenser vacuum.
	ANY	Check either EFW, AFW or MFW aligned for each SG.
	ANY	Check adequate SCM.
	CBO	Check SG tube integrity
	ATC	WHEN PZR level is $\geq 55"$ and rising, THEN perform the following: A. Verify Pressurizer Level Control Setpoint at 100" and CV-1235 in AUTO.
	ANY	B. Check adequate SCM.
	ANY	C. Verify both RCS Makeup Blocks open (CV-1233 and 1234).
	CBO	IF HPI is no longer needed to maintain RCS inventory, THEN secure HPI.
	ANY	Check RCS T-cold $\geq 430^{\circ}\text{F}$.
	ATC	Stabilize RCS temp AND adjust RCS press to within limits of Figure 3 (RT-14).
EXAMINER NOTE This event is complete when RCS temperature and pressure are under control OR As directed by the Lead Evaluator		

Facility: ANO-1

Scenario No.: 2-R2

Op-Test No.: 2010-1

Examiners: _____ Operators: _____

Initial Conditions:

- Recall 80% IC
- C28A IA compressor is out of service for overhaul
- A1/2 and H1/2 powered from Unit Aux transformer
- A2 and H1/2 SU2 handswitches in P-T-L
- C03 Rx trip P/B is failed
- P7B fails to auto start
- EFW Flow control valve CV-2645 failed open

Turnover:

- 80% Power due to grid disturbances
- RCS Boron 680 ppm, PZR 685 ppm
- C28A IA compressor is out of service for overhaul.
- Engineering requests operations perform Generator Field Ground Test per Power Operations 1102.004 step 8.11
- Zinc injection system is secured

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-(SRO) N-(BOP)	Perform Generator Field Ground test
2	CO_264A K04C6	C-(SRO) C-(BOP)	Generator Field Ground alarm
3	B5148 B5122	R-(ATC) N-(SRO)	Loss of 500Kv line and Dispatcher directs power reduction to 600Mw net
4	CO_C5A	C-(BOP) C-(SRO)	C5A Vacuum Pump Trip
5	TR592	I-(SRO) I-(ATC)	'A' EFIC pressure transmitter for 'A' SG fails low. (TS)
6	K02C4 CO_P32A	C-(ALL)	H1 Neg Seq Overvoltage alarm 'A' RCP Trip
7	RC466 DI_ICC0020	M-(ALL) C-(ATC)	Reverse Rotation Reactor Trip Shunt trip P/B (TS) (ATC-CT)
8	FW617 CV2645	C-(ATC) C-(SRO)	Manual control of CV2627 (P7A to feed of 'A' SG) (ATC-CT)
9	N/A	N-(ATC) N-(SRO)	Natural Circulation Cooling
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario #2-R2 Objectives

- 1) Evaluate individual ability to perform Generator Field Ground Test per Power Operations 1102.004 step 8.11.
- 2) Evaluate individual ability to recognize and respond to Generator Field Ground alarm.
- 3) Evaluate individual ability to perform a controlled power reduction.
- 4) Evaluate individual ability to recognize and respond to a condenser vacuum pump trip.
- 5) Evaluate individual ability to recognize and respond to a 'A' EFIC pressure transmitter to 'A' SG fails low.
- 6) Evaluate individual ability to recognize and respond to an H1 Neg Seq Overvoltage alarm and 'A' RCP Trip.
- 7) Evaluate individual ability to recognize and respond to RCP reverse rotation.
- 8) Evaluate individual ability to recognize the failure of the RX trip P/B.
- 9) Evaluate individual ability to perform a manual RX trip.
- 10) Evaluate individual ability to recognize the need to manually feed 'A' SG.
- 11) Evaluate individual ability to perform a natural circulation cool down.

SCENARIO #2-R2 NARRATIVE

The crew will assume responsibility for the plant at ~80% power due to dispatcher ordered power reduction as a result of grid disturbances caused by severe weather in Tennessee. RX Engineering directs allowing rods to withdraw to compensate for Xenon addition.

The crew will be allowed to brief performing a Generator Field Ground Test prior to entering the control room.

The CRS will direct the CBO to perform 1102.004 step 8.11 Generator Field Ground Test per the request of system engineering. The initial test will bring in a generator ground alarm and associated light on C02. The CRS will enter 1203.012 C Annunciator Corrective Actions for the ground alarm and direct the alarm be reset and a second test conducted. The second test will produce an alarm. The crew will check for other ground indications and inform relay and Operations Manager of the alarm. The CRS may direct resetting the alarm.

After the Generator Field Ground Test two switchyard breakers will open resulting in a loss of the Mablevale 500Kv line. The dispatcher should be called and he will direct a power reduction to 600Mw net in 10 minutes. Power should be lowered using the ULD in manual per 1203.045 Rapid Plant Shutdown. The crew may decide to leave the Heater Drain Pumps in service.

During the power reduction the operating condenser vacuum pump will trip due to a motor fault. Vacuum will begin to lower. The CRS should enter 1203.012 Annunciator Corrective Actions for Vacuum Pump Trip and 1203.016 Loss of Condenser Vacuum AOP if vacuum continues to lower. The standby vacuum pump should be started and vacuum monitored for recovery. Plant power should be stabilized at ~600Mwe or when vacuum recovers.

The 'A' EFIC Pressure transmitter to 'A' SG (PT-2618A) will fail low resulting in a half trip of EFW and MSLI for the 'A' SG. The crew should recognize the half trip is due to an instrument failure. The CRS should enter 1203.012K ANNUNCIATOR CORRECTIVE ACTION for EFIC System Trouble. The crew may reference 1105.005 Emergency Feedwater Initiation and Control.

(TS) LCO 3.3.11 The EFIC System instrumentation channels for each Function in Table 3.3.11-1 shall be OPERABLE.

An alarm will be received on the H1 bus for Neg Seq Overvoltage. The CRS should direct operations per 1203.012B ANNUNCIATOR CORRECTIVE ACTION and direct an AO to the H1 bus. The AO will report RCP amps to the CRS and the crew should determine the need to secure the 'A' RCP.

The 'A' RCP will experience a reverse rotation as indicated on PMS. The CRS should direct operations per 1203.031 Reactor Coolant Pump and Motor Emergencies "Reverse Rotation Section". The crew should trip the reactor and trip the remaining running RCP's. The ATC should recognize a failure of the RX trip push button and trip the reactor using the shunt trip push buttons. The CRS will enter 1202.001 Reactor Trip EOP.

(CT- Recognize a failure of the RX trip push button and trip the reactor using the shunt trip push buttons.)

(TS) LCO 3.3.2.A The RPS Manual Reactor Trip Function shall be OPERABLE.

CONTINUED

The ATC should use 1202.012 Repetitive Task 5 to control EFW system. The crew should recognize P7B failed to auto start and attempt to start P7B. The EFW flow control valve for P7B to 'A' SG CV-2646 will be Vector Closed as a result of the EFIC SG Pressure Instrument failure. CV-2645 P7A to 'A' SG is failed open requiring the crew to manually control EFW flow to the 'A' SG by throttling CV-2627 in manual.

(CT-Manual control of EFW with CV-2627 in hand before SG level reaches 410".)

The scenario is complete when the crew establishes natural circulation core cooling and stabilizes RCS temperature and pressure.

Simulator Instructions for Scenario 2-R2				
Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description
Recall 80% IC IMF FW617 (P7B fails to auto start) IMF CV2645 1 (P7A to 'A' SG) IOR DI_ICC0020 false (RX trip P/B)				
1	0	N/A	N/A	Perform Generator Field Ground test
2	HS to test +10 secs	IOR CO_264A (T1) IRF K04C6 (T1)	True On	Generator Field Ground alarm
	HS to reset	DOR CO_264A IRF K04C6	False Off	Clear Generator Field Ground alarm
	HS to test +10 secs	IOR CO_264A (T1) IRF K04C6 (T1)	True On	Generator Field Ground alarm
	If reset after 2 nd alarm	DOR CO_264A IRF K04C6	False Off	Clear Generator Field Ground alarm
3	T~15	IRF B5148 (T2) IRF B5122 (T2)	Open Open	Loss of 500Kv line and Dispatcher directs power reduction to 600Mw net
4	T~20	IMF CO_C5A (T3)	Off	C5A Vacuum Pump Trip
5	T~28	IMF TR592 (T4)	0 20	'A' EFIC pressure transmitter to 'A' SG fails low. (TS)
6	T~35	IOR K02C4 (T5)	On	H1 Neg Seq Overvoltage alarm
7	RX Trip	IMF RC466 (T6) IOR DI_ICC0020	N/A False	Reverse Rotation Reactor Trip Shunt trip P/B (TS) (ATC-CT)
8	N/A	N/A	N/A	Manual feed of 'A' SG (ATC-CT)
9	N/A	N/A	N/A	Natural Circulation Cooling

Op-Test No.: 2010-1			Scenario No.: 2-R2			Event No.: 1 & 2		
Event Description: Perform Generator Field Ground test Generator Field Ground alarm								
Time Comments		Position		Applicant's Actions or Behavior				
0		CBO		Direct performance of the generator field ground test per 1102.004 Step 8.11.				
		CBO		Momentarily place Gen Field Ground Test Switch in Test and release.				
		CBO		Verify the following: <ul style="list-style-type: none"> • Test Brush Solenoid Actuated Lamp illuminates. • Generator Field Ground (K04-C6) does not alarm. 				
		ANY		Recognize and report K04-C6.				
		CRS		Direct operations per 1203.012C ANNUNCIATOR K04 CORRECTIVE ACTION.				
		CRS		Notify Shift Manager of conditions. Contact System Engineering for immediate evaluation.				
		CBO		Validate Generator Field Ground alarm by performing the following: <ul style="list-style-type: none"> A. Clear alarm by placing Gen Field Ground Test handswitch to RESET and release. 				
EXAMINER NOTE								
When HS is taken to reset clear ground light and annunciator.								
		CBO		<ul style="list-style-type: none"> B. Test for Generator Field Ground by placing Gen Field Ground Test handswitch in TEST and release. C. Check GENERATOR FIELD GROUND alarm returns. 				
		ANY		Determine if multiple grounds exist by checking whether 2 or more of the following unexpected or unexplained conditions exist: <ul style="list-style-type: none"> A. A rise in generator bearing 7 or 8 vibration, available at any of the following: <ul style="list-style-type: none"> • Main Turbine TSIS or • PMS points VB6640X, VB6640Y for Bearing #7 • PMS points VB6650X, VB6650Y for Bearing #8 B. Rise in exciter current or voltage. C. Reduction in MVARs. D. Rise in Hydrogen Hot Gas or Cold Gas Temperatures. E. Generator Condition Monitor alarm. F. Radio Frequency Monitor alarm. 				
EXAMINER NOTE								
If AO is dispatched to Condition Monitor or Radio Frequency Monitor wait 2 minutes and report, "No alarm indications exist."								

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 2-R2

Event No.: 1 & 2

Continued

Event Description: **Perform Generator Field Ground test**
Generator Field Ground alarm

Time / Comments	Position	Applicant's Actions or Behavior
	CRS	Contact Relay Department to determine if excessive ground current (>4.6 mA DC) exists.
	CRS	IF it is determined a single ground exists, THEN contact Ops Manager and System Engineering for further guidance.
	CRS	Crew may reset the ground alarm by placing Gen Field Ground Test handswitch to RESET and release.
EXAMINER NOTE If contacted the operations manager will direct, "Continue at power while the results are evaluated."		
EXAMINER NOTE This event is complete when the second ground test is performed OR as directed by the Lead Evaluator.		

Op-Test No.: 2010-1		Scenario No.: 2-R2	Event No.: 3
Event Description: Loss of Mablevale 500Kv line and Dispatcher directs power reduction to 600Mw net			
Time / Comments	Position	Applicant's Actions or Behavior	
15	ANY	Recognize and report loss of 500KV line.	
EXAMINER NOTE At T=16 call as dispatcher (or if called by the crew) and report, "We have lost the Mablevale 500KV line and I need U1 to be at 600Mwe net in 10 minutes."			
	CRS	Direct operations per 1203.045 Rapid Plant Shutdown.	
	ATC	Commence a plant shutdown at 0.5 to 10% per minute.	
	ANY	Monitor ICS and EHC subsystems for proper integrated response.	
	CRS	Instruct At The Controls Operator to refer to "Contingency Reactivity Plans" AND Exhibit A (Operation of APSR Group) of Power Operation (1102.004) both of which are located in the Plant Data Book.	
	CRS	IF reducing power below Heater Drain Pump operation, THEN as time permits, perform "Removing MSR DI From Service" section of MSR Drain Demineralizer Operation (1106.031). (The CRS may decide to leave the P-8's in service)	
	CBO	At $\leq 75\%$, stop Heater Drain Pumps (P8A and P8B). A. Verify Hi Lvl Dump Isolations open: • CV-3041A (at B-3252) • CV-3037A (at B-4252) B. Verify Low Level Condenser Spray CV-2907 and CV-2868 (HS-2907 on C02) open. (The CRS may decide to leave the P-8's in service)	
	ATC	Stabilize plant power at ~600 Mwe net. (630 Mwe gross)	
EXAMINER NOTE This event is complete when power reduction is completed OR as directed by the Lead Evaluator.			

Op-Test No.: 2010-1	Scenario No.: 2-R2	Event No.: 4
Event Description: C5A Vacuum Pump Trip		
Time / Comments	Position	Applicant's Actions or Behavior
20	ANY	Recognize K05-A3 VACUUM PUMP TRIP alarm and report C5A vacuum pump trip.
<p align="center">EXAMINER NOTE</p> <p>If AO is sent to check vacuum pump, wait 1 minute and report, "C5B Vacuum pump is ready to start" Or "C5B Vacuum pump is running normally."</p> <p>If asked, AO will report, "C5A vacuum pump motor is hot to the touch."</p>		
	CRS	Direct Operations per 1203.012D Annunciator Corrective Actions for Vacuum Pump Trip and 1203.016 Loss of Condenser Vacuum AOP if vacuum continues to lower.
	CBO	Manually start standby Vacuum Pump C-5B
	CRS	Initiate steps to determine cause of vacuum pump trip.
	ANY	Monitor condenser vacuum for return to normal.
	N/A	IF condenser vacuum continues to lower, THEN GO TO Loss of Condenser Vacuum (1203.016). (Condenser vacuum will recover)
	CBO	To clear alarm, place hand switch for tripped pump to normal-after-stop or PULL-TO-LOCK.
<p align="center">EXAMINER NOTE</p> <p align="center">This event is complete when C5B Vacuum pump is started OR as directed by the Lead Evaluator.</p>		

Op-Test No.: 2010-1	Scenario No.: 2-R2	Event No.: 5
Event Description: 'A' EFIC Pressure transmitter to 'A' SG (PT-2618A) fails low		
Time / Comments	Position	Applicant's Actions or Behavior
25	ANY	Recognize and report K12-C7 EFIC System Trouble Alarm
	CRS	Direct operations per 1203.012K ANNUNCIATOR K12 CORRECTIVE ACTION.
	ANY	Recognize and report EFIC half trip EFW and MSLI due to 'A' EFIC pressure transmitter to 'A' SG fails low.
	ANY	IF due to half-trip of EFW or MSLI, THEN determine validity.
	N/A	IF actuation signal invalid, THEN perform the following: 2) Re-arm EFIC per Emergency Feedwater Initiation and Control (1105.005). (System cannot be re-armed due to transmitter failure)
	CRS	Refer to Technical Specifications AND the "Operability" section of Emergency Feedwater Initiation and Control (1105.005).
	CRS	Determine EFIC System Instrumentation (TS 3.3.11) applies.
	CRS	CRS may decide to bypass 'A' EFIC channel as follows: Obtain EFIC Maintenance Bypass key from SM/CRS.
	CRS	Enter the following Tech Spec Conditions: • 3.3.11 Condition A
	CRS	Enter EFIC status in Station Log.
<p align="center">EXAMINER NOTE</p> <p>If CRS directs bypassing the 'A' EFIC cabinet then call as SM and state, "Do not bypass EFIC at this time."</p>		
<p align="center">EXAMINER NOTE</p> <p align="center">This event is complete when the failed instrument is recognized and TS identified OR as directed by the Lead Evaluator.</p>		

Op-Test No.: 2010-1		Scenario No.: 2-R2	Event No.: 6
Event Description: H1 Neg Seq Overvoltage alarm 'A' RCP Trip			
Time / Comments	Position	Applicant's Actions or Behavior	
35	ANY	Recognize and report H1 NEG SEQ OVERVOLTAGE.	
	CRS	Direct operations per 1203.012B K02-C4 H1 NEG SEQ OVERVOLTAGE.	
	CRS	Direct AO at bus H1, read all three phase currents on each RC pump.	
<p align="center">EXAMINER NOTE</p> <p>After being directed wait 1 minute and report the following P32A (H11) C-531, A-561, B-503 AMPS P32C (H12) C-526, A-520, B-530 AMPS</p> <p>Bus voltage readings on H14. A-6930, B-6960, C-6990 VOLTS</p>			
	CRS	Recognize requirement to secure 'A' RCP.	
	ANY	Recognize power is below limit for three RCP operation.	
	CBO	Trip P-32A	
	CRS	Direct operation per 1203.022 Reactor Coolant Pump Trip or 1203.012G RCP Trip Annunciator Corrective Action.	
	ATC	Verify main feedwater loop flow ratio responding to match RCS loop flow ratio.	
	ATC	Verify ICS establishes and maintains proper steady state conditions: A. IF 3 RCPs in operation, THEN unit load at ~675 MWe (75% of 902 MWe).	
	ATC	C. Proper feed flow ratio with ΔT -cold near zero. D. T-ave selected to loop with highest flow. E. IF 3 RCPs in operation, THEN maximum feedwater flow to a steam generator of 5.7 x 106 lbm/hr.	
	ANY	Monitor affected RCP for reverse rotation (PMS/PDS/RCS Flow).	
		For P32A, P32C and P32D, verify the following oil pumps start on tripped RCP(s): • Both HP Oil Lift Pumps (P-63 and P-80). • Both Backstop Lube Oil Pumps (P-81 and P-82).	
<p align="center">EXAMINER NOTE</p> <p align="center">This event is complete when 'A' RCP is tripped OR as directed by the Lead Evaluator.</p>			

Op-Test No.: 2010-1		Scenario No.: 2-R2	Event No.: 7
Event Description: Reverse Rotation Reactor Trip Shunt trip P/B			
Time / Comments	Position	Applicant's Actions or Behavior	
'A' RCP trip	ANY	Recognize 'A' RCP rotating backwards	
	CRS	Direct operations per Reactor Coolant Pump and Motor Emergency (1203.031), "RCP Reverse Rotation" section.	
	ATC	Trip reactor. Recognize RX trip P/B failed to trip the reactor. Depress shunt trip P/B.	
	CBO	Trip running RCP(s). (May be performed after IA's)	
	CRS	Refer to Emergency Operating Procedure (1202.001).	
	CRS	Direct operations per 1202.001 RX Trip EOP. Direct Operators to perform their IA actions.	
	ATC	Manually Trip Rx. (Using Shunt trip P/B) (CT-ATC) A. Verify all rods inserted AND Reactor power dropping.	
	CBO	Manually trip Turbine. A. Verify Turbine throttle and governor valves closed.	
	ANY	Check adequate SCM.	
	CBO	Trip running RCP(s).	
	CRS	Advise Shift Manager to implement Emergency Action Level Classification (1903.010).	
	ATC	Reduce Letdown by closing Orifice Bypass (CV-1223).	
	CBO	Open BWST Outlet to OP HPI pump (CV-1407 or 1408).	
	ATC	Adjust Pressurizer Level Control setpoint to 100".	
	ATC	Check PZR level remains >55".	
	CBO	Check for proper electrical response.	
	ANY	Check OP HPI pump supplying normal Makeup and Seal Injection.	
	ATC	Recognize and report EFW actuated and perform RT-5.	
	ATC	Recognize and report P7B EFW pump failed to auto start.	
EXAMINER NOTE			
If AO is sent to P7B EFW Pump breaker wait 2 minutes and report, "A311 breaker has no trip flags and no abnormal indications."			

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 2-R2

Event No.: 7
CONTINUEDEvent Description: **Reverse Rotation
Reactor Trip
Shunt trip P/B**

Time / Comments	Position	Applicant's Actions or Behavior
	ATC	Attempt to manually Start P7B EFW pump. (P7B will not start)
	ANY	Check both SG levels remain ≤ 410 ".
	ANY	Check Instrument Air Header press > 75 psig.
	ANY	Check all NNI power available.
	ANY	Check all ICS power available.
	ANY	Check SG press ≥ 900 psig.
	ANY	Check MSSV OPEN alarm clear (K07-C5).
	ANY	Check MSIVs open.
	ANY	Check Turb BYP valves operate to maintain SG press 950 to 1020 psig.
	ANY	Place both Feedwater Demands in HAND AND verify demand at zero.
	ANY	Check Main Block valves closed (CV-2625 and 2675).
	ANY	Check Low Load Block valves closed (CV-2624 and 2674).
	N/A	Check Startup valves maintain SG levels 20 to 40". (EFW is actuated)
	ANY	Verify MFW pumps run back and then operate to maintain ≥ 70 psid across Startup valves.
	CBO	Check the following in service: A. Two Service Water pumps (P4A, B, or C). B. ICW pump supplying Nuclear loop (P33C or B). C. ICW pump supplying Non-nuclear loop (P33A or B). D. RB Cooling Fans (VSF1A, B, C, D, and E) E. Previously running Main Chiller(s) (VCH1A, B)
	ANY	Check ESAS Actuation alarms clear on K11.
	ANY	Check RCS press > 1700 psig.
	ANY	Check Pressurizer Level Control valve (CV-1235) maintains PZR level > 55 ".
	ANY	Check PZR steam space integrity.

CONTINUED

Op-Test No.: 2010-1		Scenario No.: 2-R2	Event No.: 7 CONTINUED
Event Description: Reverse Rotation Reactor Trip Shunt trip P/B			
Time / Comments	Position	Applicant's Actions or Behavior	
	ATC	Verify ERV, Pressurizer Spray, and Pressurizer Heaters operate to control RCS press 2050 to 2250 psig.	
	N/A	Check at least one RCP running. (Recognize RCP cannot be started due to reverse rotation)	
	ATC	Check RCS T-cold remains $\geq 540^{\circ}\text{F}$.	
CRS may go to Overcooling EOP	CRS	CRS may enter 1202.003 Overcooling based upon RCS temperature.	
	ANY	The following actions may be complete per 1202.001: <ul style="list-style-type: none"> • Check adequate SCM. • Open BWST Outlet to OP HPI pump (CV-1407). • Check Pressurizer Level Control valve operates AND maintains PZR level $\geq 55"$ (CV-1235). • Check RCS press remains ≥ 1700 psig. • Check MSSV OPEN alarm clear (K07-C5). 	
	ATC	Check RCS T-cold $\geq 430^{\circ}\text{ F}$.	
	ATC	Control RCS press within limits of Figure 3 (RT 14).	
	ANY	Check ESAS actuation alarms clear on K11.	
	ANY	Check RB press < 17 psia and stable.	
	ANY	Check MSLI alarms clear on K12 AND SG press > 600 psig.	
	ANY	Check EFW off. <ul style="list-style-type: none"> • Verify proper EFW actuation and control per RT 5. • Trip both MFW pumps. 	
	CRS	IF overcooling is terminated, THEN GO TO step 25.	
ATC	Operate ATM Dump Control System as necessary to prevent RCS heatup.		
	ANY	Check adequate SCM.	

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 2-R2

Event No.: 7
CONTINUEDEvent Description: **Reverse Rotation
Reactor Trip
Shunt trip P/B**

Time / Comments	Position	Applicant's Actions or Behavior
	ATC	Check RCS temp.
	CBO	Check SG tube integrity.
	ANY	Check RCS integrity.
	CRS	Unless cooldown is in progress OR directed otherwise by Operations Manager, GO TO Reactor Trip/Outage Recovery (1102.006) "Establishing Mode 3, >525°F Conditions" section.
EXAMINER NOTE This event is complete when RCS temperature and pressure are under control OR as directed by the Lead Evaluator.		

Op-Test No.: 2010-1

Scenario No.: 2-R2

Event No.: 8 & 9

Event Description: **Manual feed of 'A' SG**

Time / Comments	Position	Applicant's Actions or Behavior
N/A	ANY	Recognize and report over feed of the 'A' SG.
	CRS	Direct operation per RT5.
	ATC	Verify EFW actuation indicated on Bus 1 and 2 of both Trains A and B on C09.
	ATC	Verify at least one EFW pump (P7A or B) running with flow to SG(s) through applicable EFW CNTRL valve(s).
	ATC	Verify EFW CNTRL valves operate to establish and maintain applicable SG level band. IF EFW flow is excessive, THEN control EFW to applicable SG in HAND as necessary.
	ATC	Manual control of EFW with CV-2627 in hand before SG level reaches 410". (CT-ATC)
	ATC	Verify Natural circulation cooling per RT-5 <ul style="list-style-type: none"> • T-cold tracking associated SG T-sat (Fig. 2) • T-hot tracking CET temps • T-hot/T-cold ΔT stable or dropping
EXAMINER NOTE This scenario is complete when EFW flow is controlled in manual and Natural Circulation Cooling is established and stable OR as directed by the Lead Evaluator.		

Facility: ANO-1

Scenario No.: 3-R3

Op-Test No.: 2010-1

Examiners: _____ Operators: _____

Initial Conditions:

- Recall 100% IC 110
- C28A IA compressor is out of service for overhaul
- #2 EDG OOS for starting air motor replacement

Turnover:

- 100% power
- C28A IA compressor is out of service for overhaul
- #2 EDG OOS for starting air motor replacement

Event No.	Malf. No.	Event Type*	Event Description
1a	IMF CO_P6A IRF K12C1	N-(BOP) N-(SRO)	Place Electric Fire Pump (P-6A) into service to support fire brigade training.
1b	IMF TR 622	TS-(SRO)	BWST Level Transmitter LT-1411 fails to ~10 feet indicated level
2	IMF TR631	I-(ATC) I-(SRO)	RCP total seal injection flow transmitter (PDT-1239) fails to full scale.
3	IA170	R-(ATC)	IA Leak will occur resulting in IA pressure lowering to between 45# and 60# requiring a power reduction.
4	Delete IA170	N-(SRO, ATC)	At ~70% the IA leak will be patched. IA pressure will recover and plant power should be stabilized.
5	RD304 RD279	M-(ALL)	Two group 7 rods will drop into the core requiring a manual reactor trip. (ATC-CT) (TS)
6	ED183	M-(ALL)	A loss of off site power will occur resulting in a blackout with #1 EDG running with its output breaker not auto closing. (Possible BOP-CT)
7	DI_A308C	C-(BOP) C-(SRO)	#1 EDG auto start with output breaker not auto closing.
8 & 9	N/A	N-(BOP) N-(SRO) C-(ATC) C-(SRO)	U2 will report the AAC Generator is available. The WCO will report an oil leak on P7A EFW pump and is expected to lose oil in ~10 minutes. (Possible BOP-CT) (TS)
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario #3-R3 Objectives

- 1) Evaluate individual ability to Place Electric Fire Pump (P6A) into Service.
- 2) Evaluate individual ability to recognize and respond to an electrical fault on P6A.
- 3) Evaluate individual ability to recognize and respond to an IA Leak requiring a power reduction.
- 4) Evaluate individual ability to stop the power reduction and stabilize the plant.
- 5) Evaluate individual ability to recognize and respond to two group 7 rods dropping into the core requiring a manual reactor trip.
- 6) Evaluate individual ability to recognize and respond to a loss of off site power resulting in a blackout condition with #1 EDG running but not tied on.
- 7) Evaluate individual ability to recognize and respond to an oil leak on P7A EFW pump.
- 8) Evaluate individual ability to recognize and respond to a failure of an EDG output breaker to close.
- 9) Evaluate individual ability to recognize and respond to input signal failures to the pressurizer level control system.
- 10) Evaluate individual ability to perform a rapid power reduction in accordance with plant abnormal operating procedures.
- 11) Evaluate individual ability to recognize and respond to abnormal conditions associated a loss of oil to P7A Turbine Driven EFW pump and to regain power to A3 for P7B Motor Driven EFW pump.
- 12) Evaluate individual ability to energize the vital A4 bus from the Alternate AC Generator.
- 13) Evaluate individual ability to start P7B EFW pump and secure P7A EFW pump.

SCENARIO #3-R3 NARRATIVE

The crew will assume responsibility for the plant at 100% power and ICS in full automatic. The #2 EDG is OOS for air start motor replacement. C28A IA compressor is OOS for overhaul. The crew will place Electric Fire Pump (P6A) Into service per 1104.032 Fire Protection System step 7.5. When the pump is started its supply breaker will trip on over current.

After the Electric fire pump trips a BWST level transmitter LT-1411 will fail to ~10 feet indicated level due to an internal failure and a small leak (~1 drop per minute). The Crew should recognize and report K09-B6 BWST LEVEL HI/LO alarm. The CRS should refer dispatch an operator to inspect the level transmitter and refer to 1202.012H ANNUNCIATOR K09 CORRECTIVE ACTION. The WCO will report a small ~1 drop per minute leak on the transmitter.

(TS 3.3.15 The PAM instrumentation for each Function in Table 3.3.15-1 shall be OPERABLE)

The RCP total seal injection flow transmitter PDT1239 will fail upward full scale. This will cause seal injection control valve CV-1207 to go closed. Annunciator K08-A7 Seal Injection Flow LO alarm will come into alarm. The CRS should direct operations per 1203.012G Annunciator K08 Corrective actions and direct manual control of CV-1207 to restore seal injection flow.

An Instrument Air (IA) header leak will develop on the main IA header in the turbine building basement. The leak will result in a lowering IA pressure to between 45# – 60#. The operators should enter 1203.024 Loss of Instrument Air and commence a rapid plant shutdown. At ~70% power the field operators and/or maintenance will be successful in temporarily patching the leak resulting in IA pressure recovering to normal. The crew should stop the power reduction and stabilize plant power.

Two control rods will drop. The crew should recognize two dropped control rods and the ATC operator should trip the reactor **(CT – Reactor should be tripped before Tcold reaches 540°F)**.

(TS 3.1.4.C More than one CONTROL ROD inoperable, or not aligned within 6.5% of its group average height, or both.)

~10 minutes after the trip a grid disturbance created by the trip will result in a loss of offsite power. The #1 EDG will automatically start but with its output breaker failing to close. The CBO should manually close the A308 EDG output breaker by taking the HS to P-T-L to clear the breaker anti-pump feature to energize the A3. **(Possible CT-Energize A3 with EDG#1)**

Unit 2 should be contacted to start the AACG and supply the Unit1 vital bus. The crew should power A4 from the AACG. Emergency Feedwater (EFW) using the turbine driven EFW will supply both SGs and provide decay heat removal capability until A3 is energized.

(TS Possible 3.0.3 for both EDG's inoperable.)

~15 minutes post trip the WCO will call the control room and report EFW pump P7A has an oil leak on its inboard pump bearing and is expected to run out of oil in ~10 minutes.

The AACG will be available to supply the U1 cross tie bus. The CBO should energize A3 (if #1 EDG output breaker is open) or A4 (if #1 EDG supplying A3) from the AACG. **(Possible CT-Energize A3 with the AAC Generator)**

P7B should be started or allowed to start and P7A secured.

(TS LCO 3.7.5.B Two EFW trains shall be OPERABLE)

The scenario can be terminated after P7B is supplying both SGs and P7A is secured or as directed by the lead evaluator.

Simulator Instructions for Scenario 3-R3				
Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description
Recall 100% IC 110 IOR DI_A308T				
1a	0	IOR DI_HS3602T IRF K12C1	T ON	Place Electric Fire Pump (P-6A) into service to support fire brigade training.
1b	10	IMF TR 622	10 5	BWST Level Transmitter LT-1411 fails to ~10 feet indicated level.
2	15	IMF TR631 (T2)	80 20	RCP total seal injection flow transmitter (PDT-1239) fails to full scale.
3	25	IMF IA170 (T3)	1	IA Leak will occur resulting in IA pressure lowering to between 45# and 60# requiring a power reduction.
4	~70%	DMF IA170	N/A	At ~70% the IA leak will be patched. IA pressure will recover and plant power should be stabilized.
5	35	IMF RD304 (T4) IMF RD279 (T4)	0 0	Two group 7 rods will drop into the core requiring a manual reactor trip.
6	45	IMF ED183 (T5)		A loss of off site power will occur resulting in a blackout with #1 EDG running with its output breaker not auto closing.
	After ED183	DOR DI_A308T	N/A	
7 & 8	55	IRF A901	T	AAC Generator is available for loading The WCO will report an oil leak on P7A EFW pump and is expected to lose oil in ~10 minutes. P7B should be started.
N/A	10 min after P7A call	IMF FW076	N/A	P7A Trip.

Op-Test No.: 2010-1		Scenario No.: 3-R3	Event No.: 1a & b
Event Description: Place Electric Fire Pump (P-6A) Into Service to support fire brigade training.			
BWST Level Transmitter LT-1411 fails low			
Time/Comments	Position	Applicant's Actions or Behavior	
0	CBO	IF needed for firefighting, firewater system surveillance, fire brigade training, etc., OR to prevent unneeded autostarts, THEN start the desired Firewater Pump from C19 as follows: IF desired to start P-6A from C19, THEN place P-6A handswitch (HS-3603) to start.	
EXAMINER'S NOTE			
When pump starts trip P6A supply breaker A114			
	ANY	Dispatch an operator to A114	
	BOP	Place power for P6A handswitch on C19 in CLOSE, and verify A114 closed.	
EXAMINER NOTE			
1 minute after being dispatched call as AO and report, "The over current relay is tripped."			
	CRS	Direct Operations per 1203.009 FIRE PROTECTION SYSTEM ANNUNCIATOR CORRECTIVE ACTION.	
	CRS	IF trip was due to fault, THEN refer to "Reclosing Tripped Individual Load Supply Breakers" section of Electrical System Operations (1107.001). (The supply breaker should not be reclosed)	
	N/A	IF pressure drops to <90 psig, THEN verify that Diesel Fire Pump (P-6B) starts. (Pressure will be normal)	
EXAMINEER NOTE			
If AO is asked about fire header pressure wait 1 minute and report, "Jockey Fire Pump P11 is operating normally to keep header pressurized."			
	CRS	IF P-6A is determined to be inoperable, THEN refer to applicable Unit 1 TRM Fire Protection specifications for limiting conditions for operation, AND inform Unit 2. TRM 3.7.8	
EXAMINER NOTE			
The following actions are for the BWST level transmitter failure.			
	ANY	Recognize and report K09-B6 BWST Level HI/LO	
	CRS	Direct operations per 1202.012H ANNUNCIATOR K09 CORRECTIVE ACTION.	

CONTINUED

Op-Test No.: 2010-1	Scenario No.: 3-R3	Event No.: 1a & b Continued
Event Description: Place Electric Fire Pump (P-6A) Into Service to support fire brigade training. BWST Level Transmitter LT-1411 fails low		
Time/Comments	Position	Applicant's Actions or Behavior
	ANY	The WCO should be dispatched to the BWST Level transmitter.
EXAMINER NOTE 2 minutes after the WCO is dispatched report, "There is a small leak ~1 drop per minute coming from LT-1411. The leakage is being contained and RP has been notified."		
	BOP	Check BWST (T-3) Level gauges on C16 and C18 AND SPDS L1411 and L1421.
	ANY	Determine other instrument is indicating normally.
	CRS	Refer to TS 3.5.4 for BWST (T-3) requirements.
	CRS	Determine alarm is caused by a level instrument failure, and refer to Tech Spec 3.3.15, Post Accident Monitoring (PAM) Instrumentation.
EXAMINER NOTE This event is complete when Crew determines BWST level instrument is failed and TS referenced, OR as directed by the Lead Evaluator.		

Op-Test No.: 2010-1	Scenario No.: 3-R3	Event No.: 2
Event Description: RCP total seal injection flow transmitter (PDT-1239) fails to full scale		
Time/Comments	Position	Applicant's Actions or Behavior
15	ATC	Recognize and report K08-A7 RCP SEAL INJ FLOW LO in Alarm.
	SRO	Direct operations per 1203.012G Annunciator K08 Corrective Action.
	ATC	Check RCP P-32A thru D Seal Injection Flow indications on C04 to determine which pump is in alarm.
	ATC	IF RCP SEAL COOLING FLOW LO (K08-E7) is not alarmed, THEN Verify normal total flow to RCP Seals Total INJ Flow recorder on C04 and RC Pump seals Total INJ Flow (CV-1207). (Alarm will NOT be in)
	ATC	CV-1207 in manual and opened to establish ~8 gpm per RCP.
	ATC	If directed take CV-1206 Seal Injection Block Valve to OVRD.
<p align="center">EXAMINER NOTE</p> <p align="center">This event is complete when RCP seal flow is restored OR as directed by the Lead Evaluator.</p>		

Op-Test No.: 2010-1	Scenario No.: 3-R3	Event No.: 3 & 4
<p>Event Description: IA Leak will occur resulting in IA pressure lowering to between 45# and 60# requiring a power reduction.</p> <p>At ~70% the IA leak will be patched. IA pressure will recover and plant power should be stabilized.</p>		
Time/Comments	Position	Applicant's Actions or Behavior
25	ANY	Acknowledge and report lowering IA header pressure or low IA header pressure alarm.
	SRO	Direct operations per: 1203.012K K12-C3 IA Compressor Trouble 1203.012K K12-B3 Instrument Air Header Pressure LO 1203.024 Loss of Instrument Air Section 2 1203.045 Rapid Plant Shutdown
	ATC	Commence plant shutdown at $\leq 10\%$ per minute <ul style="list-style-type: none"> On C03 Place ULD in Manual Lower on ULD toggle
<p align="center">EXAMINER NOTE</p> <p>When U2 is informed of leak report U2 IA pressure ~85#</p> <p>If AO is sent to look for a leak wait 1 minute and report, "Leak is on a straight leg pipe union in the north turbine building basement. I will attempt to seal the leak but request mechanics to assist."</p> <p>If AO is sent to check the operation of C28B wait 1 minute and report, "C28B IA compressor is running normally but with a high air flow."</p>		
	ATC	On C04, place RCP Seal INJ Block (CV-1206) pushbutton in OVRD.
	SRO	Continue with efforts to return IA pressure to normal as directed by Section 1, "Low Instrument Air Pressure (≤ 75 PSIG)".
	ATC	Continue with power reduction for IA leak.
<p align="center">EXAMINER NOTE</p> <p>EVENT 4 At ~70% IA leak will be patched, IA pressure will recover and plant power should be stabilized.</p>		
<p align="center">EXAMINER NOTE</p> <p>T=70% power the AO will call the control room and report, "A temporary patch has stopped the leak from the main header in the basement where a branch pipe had come unsoldered."</p>		
	ATC	WHEN instrument air pressure recovers (>60 psig), THEN stop plant shutdown.
	ATC	Stabilize plant power. SG/RX master may be placed in hand to stop power reduction or the ULD setpoint raised.
	CRS	Direct Chemistry Department to secure ZINC Injection.
<p align="center">EXAMINER NOTE</p> <p align="center">This event is complete when Rx power ~70% OR as directed by the Lead Evaluator.</p>		

Op-Test No.: 2010-1

Scenario No.: 3-R3

Event No.: 5

Event Description: **Two group 7 rods will drop into the core requiring a manual reactor trip.**

Time/Comments	Position	Applicant's Actions or Behavior
35	ANY	Acknowledge and report two rods dropped into core.
	SRO	Direct manual reactor trip per 1203.003 Control Rod Drive Malfunction, Section 1.
	ATC	Manually trip the reactor trip. (CT-ATC)
	SRO	Direct operations per 1202.001 Reactor Trip.
	ATC	Verify All Rods Inserted and Rx Power lowering.
	BOP	Manually trip Turbine, Verify Turbine throttle and governor valves closed.
	ATC	Check adequate SCM.
	SRO	Advise Shift Manager to implement Emergency Action Level Classification (1903.010). (No criteria for EAL is met at this time)
	BOP	On C12, close gland seal spill over bypass valve.
	ATC	On C04, reduce Letdown by closing Orifice Bypass (CV-1223).
	BOP	Open BWST Outlet to OP HPI pump (CV-1407 or 1408).
	ATC	Adjust Pressurizer Level Control set point to 100".
	BOP	Check for proper electrical response
	ATC/BOP	Check OP HPI pump supplying normal Makeup and Seal Injection.
	ATC	Check both SG levels remain $\leq 410"$.
	ATC	Check IA pressure $>75\#$.
	ATC	Check NNI & ICS power available.
	ATC	Check SG press ≥ 900 psig.
	ATC	Check MSSV OPEN alarm clear (K07-C5).
	ATC	Check MSIVs open.
	ATC	Check Turb BYP valves operate to maintain SG press 950 to 1020#.
	ATC	Place both Feedwater Demands in HAND AND verify demand at zero.

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 3-R3

Event No.: 5

Continued

Event Description: **Two group 7 rods will drop into the core requiring a manual reactor trip.**

Time/Comments	Position	Applicant's Actions or Behavior
	ATC	Check Main Block valves closed (CV-2625 and 2675).
	ATC	Check Low Load Block valves closed (CV-2624 and 2674).
	ATC	Check Startup valves maintain SG levels 20 to 40".
	ATC	Verify MFW pumps run back and then operate to maintain ≥ 70 psid across Startup valves.
	CBO	Check the following in service: A. Two Service Water pumps B. ICW pump supplying Nuclear loop C. ICW pump supplying Non-nuclear loop D. RB Cooling Fans E. Previously running Main Chiller(s)
	ANY	Check ESAS Actuation alarms clear on K11.
	ATC	Check RCS press > 1700 psig.
	ATC	Check Pressurizer Level Control valve (CV-1235) maintains PZR level > 55".
EXAMINER NOTE This event is complete when Rx power is stabilized OR as directed by the Lead Evaluator.		

Op-Test No.: 2010-1		Scenario No.: 3-R3	Event No.: 6
Event Description: A loss of off site power will occur resulting in a blackout with #1 EDG running with its output breaker not auto closing.			
Time/Comments	Position	Applicant's Actions or Behavior	
45	ANY	Acknowledge and report the loss of offsite power.	
	SRO	Direct operations from 1202.008 Blackout.	
	BOP	Acknowledge and report #1 EDG running with its output breaker open.	
	BOP	Manually close #1 EDG output breaker by going to P-T-L and release hand switch. (Possible CT-BOP)	
	SRO	Transition to and direct operations from 1202.007 Degraded Power. (If A3 is energized)	
	SRO	Advise Shift Manager of the loss of offsite power and to implement Emergency Action Level Classification (1903.010). NUE, EAL 4.1 Degraded Power	
	BOP	On C10, verify B55/56 powered from B5	
	BOP	On C16, isolate idle SW loop: <ul style="list-style-type: none"> • Close ACW Isolation (CV-3643) • Close the SW Crosstie necessary to isolate the idle SW Loop: CV-3644 or CV-3640 • Close available Service Water to ICW Coolers Supply: CV-3820 	
	SRO	Request U2 start the AACG.	
	BOP	Verify SW to DG1 CLRs open to operating EDGs (CV-3806).	
	BOP	Verify a Service Water pump on DG1, after 15-second time delay (P4A).	
	ATC	Actuate MSLI for both SGs <u>AND</u> verify proper actuation and control of EFW and MSLI (RT 6).	
EXAMINER NOTE			
T~50 Report a WCO, "There is an oil leak on P7A EFW pump from the inboard turbine bearing. Estimate ~10 minutes of pump availability remaining."			
	ANY	Operate ATM Dump CNTRL valves in HAND to minimize cycling and conserve Instrument Air.	
EXAMINER NOTE			
If directed open the ADV block as follows: IMF CV2676 1			
	BOP	Isolate Letdown by closing Letdown Coolers Outlet (CV-1221) or on C18 (CV-1214/1216).	
EXAMINER NOTE			
This event is complete when RCS temperature and pressure are under control OR as directed by the Lead Evaluator.			

Op-Test No.: 2010-1		Scenario No.: 3-R3	Event No.: 7 & 8
Event Description: U2 will report the AAC Generator is available for (CBO-CT) The WCO will report an oil leak on P7A EFW pump and is expected to lose oil in ~10 minutes.			
Time/Comments	Position	Applicant's Actions or Behavior	
EXAMINER NOTE			
T~55	Report as U2, "AACG is running. 2A901 is closed and an operator is monitoring AACG operation."		
EXAMINER NOTE			
T~59 or 9 minutes after initial P7A call as WCO and report, "I cannot find any additional oil for P7A EFW pump. There is no oil in the sight glass and the pump bearings are getting hot."			
This section dependent upon #1 EDG supplying A3 bus.	SRO	Direct BOP to energize A4 from AACG.	
	BOP	If #1 EDG is supplying A3 then energize A4 from AACG: (Possible CT-BOP) <ul style="list-style-type: none"> • Place DG2 Output Breaker (A-408) in PULL-TO-LOCK. • Verify A2 to A4 Supply Breaker (A-409) open. • Unless 2K9 is already supplying bus A3, verify A3-A4 Tie Breakers open (A-310 and A-410). • Verify no bus A4 Lockout. • Turn Synchronize switch on for A3-A4 Tie Breakers (A-310 and A-410). • WHEN Unit 2 reports 2K9 is ready for loading, THEN close A4-A3 Crosstie (A-410). • Turn Synchronize switch off. • Coordinate with Unit 2 to ensure 2K9 is NOT overloaded when starting loads on bus A4. • IF desired, THEN start Service Water Pump P-4B or P-4C per Service Water and Auxiliary Cooling System (1104.029) OR applicable Emergency Operating Procedure. 	

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 3-R3

Event No.: 7 & 8

Continued

Event Description: **U2 will report the AAC Generator is available for (CBO-CT)
The WCO will report an oil leak on P7A EFW pump and is
expected to lose oil in ~10 minutes.**

Time/Comments	Position	Applicant's Actions or Behavior
This section dependent upon #1 EDG NOT supplying A3 bus.	SRO	Direct BOP to energize A3 from AACG.
	BOP	<p>If #1 EDG is NOT supplying A3 then energize A3 from AACG: (Possible CT-BOP)</p> <ul style="list-style-type: none"> Place DG1 Output Breaker (A-308) in PULL-TO-LOCK. Verify A1 to A3 Supply Breaker (A-309) open. Unless 2K9 is already supplying bus A3, verify A3-A4 Tie Breakers open (A-310 and A-410). Verify no bus A3 Lockout. Turn Synchronize switch on for A3-A4 Tie Breakers (A-310 and A-410). WHEN Unit 2 reports 2K9 is ready for loading, THEN close A4-A3 Crosstie (A-310). Turn Synchronize switch off. Coordinate with Unit 2 to ensure 2K9 is NOT overloaded when starting loads on bus A3. IF desired, THEN start Service Water Pump P-4A or P-4B per Service Water and Auxiliary Cooling System (1104.029) OR applicable Emergency Operating Procedure.
	ATC	Verify P7B EFW pump running.
	ATC	Secure P7A EFW pump.
	BOP	Place RCP Seals Bleedoff (Alternate Path to Quench Tank) controls in CLOSE (SV-1270, 1271, 1272 and 1273).
	BOP	Isolate RCP Seal Bleedoff (Normal) by closing CV-1274.
	BOP	Place the following handswitches in PULL-TO-LOCK: A1, A2, H1, and H2 feeder breakers.
	ATC	<p>Place the following handswitches in PULL-TO-LOCK:</p> <ul style="list-style-type: none"> Condensate pumps (P2A, B and C) ICW pumps (P33A, B and C)
<p align="center">EXAMINER NOTE</p> <p align="center">This scenario is complete when the AAC Generator is supplying A3 or A4 and P7B is running OR as directed by the Lead Evaluator.</p>		

Facility: ANO-1

Scenario No.: 4-R2-Spare

Op-Test No.: 2010-1

Examiners: _____ Operators: _____

Initial Conditions:

- Recall 100% IC
- C28A IA compressor is out of service for overhaul.
- RPS is failed

Turnover:

- 100% power
- C28A IA compressor is out of service for overhaul.
- Swap operating EH oil pumps following maintenance on the standby pump for a 30 min run PMT. The AO has been briefed and is standing by the EH pump.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP, SRO)	Swap the operating EH oil pumps (P14A on, P14B off)
2 & 3	FW086	C (SRO, BOP)	P8A heater drain pump winding failure and trip
	N/A	N (SRO) R (ATC)	Power reduction
4	TR580	I (ALL)	Controlling Turbine Header Pressure Instrument (PT-2683) Fails Low
	N/A	N (ATC, BOP)	Return ICS to automatic
5	CO_P14B CO_P14A DI_PB9201	C (BOP)	Operating EH oil pump will trip Turbine trip >43%
6	RP246,7,8,9	C (SRO, ATC) M (ALL)	RPS is failed (TS) Manual reactor trip (ATC-CT)
7 & 8	RC002	M (ALL)	~210 GPM tube rupture in the 'B' SG (TS) (Possible BOP-CT)
	N/A	N (ATC)	Plant cooldown and depressurization
9	IMF CV061	C (ALL)	Operating HPI pump trip (BOP-CT)
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario #4-R2 Objectives

- 1) Evaluate individual ability to swap running EH oil pumps.
- 2) Evaluate individual ability to recognize and respond to a heater drain pump trip.
- 3) Evaluate individual ability to perform a rapid plant power reduction.
- 4) Evaluate individual ability to recognize and respond to a turbine header pressure instrument failing low.
- 5) Evaluate individual ability to recognize and respond to the loss of the operating EH oil pump and resultant turbine trip.
- 6) Evaluate individual ability to recognize and respond to a reactor protection system failure to complete an automatic trip.
- 7) Evaluate individual ability to recognize and respond to a steam generator tube rupture.
- 8) Evaluate individual ability to commence a reactor coolant system cool down and depressurization.
- 9) Evaluate individual ability to recognize and respond to the operating HPI pump trip.

SCENARIO #4-R2 NARRATIVE

The crew will assume the watch with the plant at 100% power. C28A IA compressor is out of service for overhaul.

The turn over sheet will direct the crew to swap to P14A operating turbine electro-hydraulic pump per 1106.012 Electro-Hydraulic Oil System Operation Section 14 for a 30 minute run PMT. **(SRO-N) (BOP-N)**.

P8A heater drain pump will experience a winding failure causing a high temperature alarm and P8A trip **(SRO-C) (BOP-C)**. The CRS should reference 1203.012E Annunciator Corrective Action P8A/P8B FLOW LO and/or CONDENSATE PUMP AUTOSTART.

A plant power reduction is required to maintain suction pressure. The CRS should direct the power reduction per 1203.012E Annunciator Corrective action and 1203.045 Rapid Plant Shutdown **(ATC-R) (SRO-N)**.

The Controlling Turbine Header Pressure Instrument (PT-2683) will fail low. **(ALL-I)** This will result in the turbine lowering demand to raise header pressure. The reactor and feedwater will rise as a result of the header pressure error. A SASS mismatch alarm will be received. The CRS will direct operations per 1203.012F Annunciator Corrective actions for SASS mismatch alarm and 1203.001 ICS Abnormal Operation. The crew should verify the turbine control, SG/RX master, and both turbine bypass valves in manual. Once the plant is stable the crew will verify the alternate instrument is good and select the good instrument on C03.

The crew should return ICS to automatic.

After the power reduction the operating EH oil will trip. The standby pump will not start **(BOP-C)**. The loss of both EH pumps will result in a turbine trip. (Crew may complete a manual RX trip prior to the turbine trip) The reactor will fail to trip do to a failure of RPS **(ATC-C) (SRO-C) (TS)**. The ATC should manually trip the reactor using the Rx trip push button **(ATC-CT) (ATC-M) (BOP-M) (SRO-M)**.

TS 3.3.1 Condition C**TS 3.3.2 Condition A**

(CT– The reactor should be manually tripped before the pressurizer indicates off scale high >320”).

EAL ALERT 6.2 RPS Failure to Complete an Automatic Trip

A ~210 gpm tube rupture will occur in the 'B' SG **(ATC-M) (BOP-M) (SRO-M) (TS)**. The CRS should direct operation per 1202.006 Tube Rupture. The rupture will be large enough to require HPI be initiated **(Possible BOP-CT)**. A RCS depressurization and cooldown should be started **(ATC-N)**.

TS 3.4.13 Condition B

(Possible CT– HPI should be initiated before SCM is lost.)

EAL NUE 3.2 S/G Tube Leak > Tech. Spec. Limits**EAL ALERT 2.2 RCS Leakage > Normal Makeup Capacity**

The Operating HPI pump breaker trips due to a motor fault. **(SRO-C) (ATC-C) (BOP-C)** The CRS should direct operations per 1203.026 Loss of Reactor Coolant Makeup section 1 Loss of HPI Pump or RT2 to establish HPI. The crew should diagnose the pump trip as a breaker fault and start the ES standby HPI pump. HPI should be restarted using the standby pump or by using the ES pump Using RT2. **(BOP-CT)**

(CT– HPI should be started or raised on the ES pump before SCM is lost.)

The scenario may be terminated when HPI has been restarted or at the direction of the lead evaluator.

Simulator Instructions for Scenario 4-R2				
Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description
Recall IC IMF RP246,7,8,9 RPS is failed IRF CO_C28A off C28A IA compressor OOS IOR DO_C28ASLG C28A IA compressor OOS				
1	0	N/A	N/A	Swap the operating EH oil pumps
2 & 3	7	IMF FW086 (T1)	N/A	P8A heater drain pump will experience a winding failure causing it to heat up and eventually trip requiring a power reduction to ~70%.
4	20	IMF TR580 (T2)	600 240	Controlling Turbine Header Pressure Instrument (PT-2683) Fails Low over 4 minutes.
		N/A	N/A	Return ICS to automatic.
5 & 6	35	IRF CO_P14B (T3) IRF CO_P14A (T3)	OFF OFF	P14A operating EH pump will trip causing a loss of EH oil pressure.
	35.5	IOR DI_PB9201 (T4)	True	Main turbine trip >43% power (Crew may complete a manual RX trip prior to the turbine trip).
	Initial	IMF RP246,7,8,9	N/A	RPS is failed and will not cause an automatic trip.
7 & 8	Check MSIV open	IMF RC002 (T5)	.5 120	A ~210 GPM tube rupture will develop in the 'B' SG requiring initiation of HPI.
	N/A	N/A	N/A	A plant cooldown is required to allow for isolation of the bad SG.
9	55	IMF CV061 (T6)	N/A	Operating HPI pump breaker trips due to a motor fault

Op-Test No.: 2010-1

Scenario No.: 4-R2

Event No.: 1

Event Description: **Swap the operating EH oil pumps**

Time / Comments	Position	Applicant's Actions or Behavior
0	CRS	Direct performance of 1106.012 Section 14
	CRS, BOP	Dispatch operator to EH oil pumps to monitor for proper operation.
	BOP	Start P14A by placing HS-9201 in START.
EXAMINER NOTE AO at the EH pumps will report, "EH pump is normal after start and EH pressure on PI-8534 is reading ~1850 psi."		
	ANY	Recognize P14A Pressure is normal.
	BOP	Stop P14B.
EXAMINERS NOTE If asked report, "P14B shutdown is complete per the local exhibit AA."		
EXAMINER NOTE This event is complete when P14B is secured OR as directed by the Lead Evaluator.		

Op-Test No.: 2010-1	Scenario No.: 4-R2	Event No.: 2 & 3
Event Description: <ul style="list-style-type: none"> • P8A heater drain pump will experience a winding failure causing it to heat up and eventually trip. • A power reduction is required to maintain feedwater suction pressure. 		
Time / Comments	Position	Applicant's Actions or Behavior
7	ANY	Recognize and report P8A winding temperature is going up. (Crew may elect to stop P8A prior to the pump tripping.)
	CRS	Direct operations per 1203.012E Annunciator K06-E8 Corrective action.
	CRS	Initiate steps to determine cause of high temperature alarm
EXAMINER NOTE		
If asked the AO will report, "Nothing abnormal at P8A."		
AO will report, "T40A High Level Dump control valve controlling level properly."		
	ATC	Commence reducing power at ~ 10%/minute per 1203.012E and Rapid Plant Shutdown (1203.045) to within the capacity of T40A high level dump (~ 630 MW or ~70% power) and secure affected pump. (The pump may trip before a power reduction can be started.)
	ATC, BOP	Monitor ICS and EHC subsystems for proper integrated response. May receive a Condensate pump auto start.
	CRS	As time permits instruct ATC to refer to "Contingency Reactivity Plans" AND Exhibit A (Operation of APSR Group) of Power Operation (1102.004).
	CRS	Direct securing Zinc Injection.
	ANY	Contact AO to verify Htr Drn Tk T40A Hi Lvl Dump Isol (CV-3041A) is open at breaker (B-3252).
EXAMINER NOTE		
When asked report as AO, "P8A is not rotating."		
	ANY	Direct AO to check the tripped Heater Drain Pump for reverse rotation.
	ATC, BOP	Place Low Level Condenser Spray CV-2907 AND CV-2868 in service by placing HS-2907 on C02 in OPEN.
EXAMINER NOTE		
This event is complete when plant power is stabilized at ~70% OR as directed by the Lead Evaluator.		

Op-Test No.: 2010-1		Scenario No.: 4-R2		Event No.: 4	
Event Description:		Controlling Turbine Header Pressure Instrument (PT-2683) Fails Low			
Time / Comments		Position	Applicant's Actions or Behavior		
20		ANY	Recognize and report turbine header pressure instrument failing low.		
		CRS	Direct operations per 1203.001 ICS Abnormal Operation.		
		BOP	If Turbine in OPER AUTO then perform the following to raise header pressure <ul style="list-style-type: none">While monitoring SG pressure, raise SETTER as necessary to raise turbine load to stabilize RCS Pressure.Depress GO pushbutton AND release.Verify REFERENCE matches SETTER.		
		BOP	If Turbine in MANUAL then perform the following to raise header pressure. <ul style="list-style-type: none">While monitoring SG pressure operate GV Raise pushbuttons as necessary on C01		
		ATC	Verify SG/RX Demand H/A station in HAND.		
		ATC	Place BOTH TURB BYP Valve H/A stations in HAND.		
		ANY	Select the good Turbine Header Pressure instrument for indication. (PT-2633 the 'Y' position for the SASS selector switch)		
		ATC	Adjust SG/RX Demand H/A station as necessary to stabilize power < 100%.		
		CRS	Direct returning ICS to automatic per 1105.004 Integrated Control System.		
		ATC	Verify initial conditions: <ul style="list-style-type: none">Rod Controller (Diamond Panel) in Manual, if applicableReactor Demand in HANDFW Demand Loop A in HANDFW Demand Loop B in HANDLoad Ratio ÄT-cold in HANDSG/RX Demand in HANDULD Unit Master Station in HAND		

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 4-R2

Event No.: 4

Continued

Event Description: **Controlling Turbine Header Pressure Instrument (PT-2683) Fails Low**

Time / Comments	Position	Applicant's Actions or Behavior
	ATC	Verify Turbine in INTEG CONTROL, controlling Turbine Header pressure at setpoint.
	BOP	Place Turbine in integrated control as follows: <ul style="list-style-type: none"> • Verify main steam header pressure is at the setpoint selected on Header Pressure Controlling substation. • Monitor Governor Valve demand and the following PMS/PDS points for stable conditions • When turbine header pressure is at setpoint (± 5 PSI) AND stable (rate of change < 10 PSI/minute), Then place turbine in INTEG CONTROL. • Verify turbine control is steady
	ATC	Check MEAS VAR on both FW Loop Demand stations on the caret.
	ATC	Check T-ave is at setpoint.
	ATC	Check Reactor Demand MEAS VAR on the caret.
	ATC	Check SG/RX H/A station that POS and MEAS VAR are approximately equal.
	ATC	With the above stations aligned, place them in AUTO in the following sequence: <ol style="list-style-type: none"> A. Rod Controller (Diamond Panel), if applicable. B. Reactor Demand C. Feedwater Loop Demands: <ul style="list-style-type: none"> • Loop A FW Loop Demand • Loop B FW Loop Demand D. Load Ratio ΔT-cold E. SG/RX Demand
EXAMINER NOTE This event is complete when the ICS is in automatic OR as directed by the Lead Evaluator.		

Op-Test No.: 2010-1		Scenario No.: 4-R2	Event No.: 5 & 6
Event Description:			
<ul style="list-style-type: none">• The operating EH pump breaker will trip causing a loss of EH fluid and a main turbine trip >43% power.• RPS is failed and will not cause an automatic trip. (TS) The operators are required to manually trip the reactor.			
Time / Comments		Position	Applicant's Actions or Behavior
35		ANY	Recognize and report P14A tripped and P14B failed to start.
		CRS	Dispatch operator to reset P14A breaker (B-3225). (Crew may not have time to dispatch this operator before the turbine trips)
		ANY	Recognize turbine valves closing.
35.5		ANY	Recognize turbine tripped >43% power.
		ANY	Recognize RPS failed to automatically trip the reactor. TS 3.3.1 Condition C
		ATC	Trip the reactor using the reactor trip push button. CT criteria – The reactor should be manually tripped before the pressurizer indication goes off scale >320”.
		CRS	Direct operations per 1202.001 Reactor Trip.
		ATC	Manually Trip Rx, Verify all rods inserted and Reactor power dropping.
		BOP	Manually trip Turbine, Verify Turbine throttle and governor valves closed
		ANY	Check adequate SCM.
		CRS	Advise Shift Manager to implement Emergency Action Level Classification EAL ALERT 6.2 RPS Failure to Complete an Automatic Trip
		ATC	Reduce Letdown by closing Orifice Bypass.
		BOP	Open BWST Outlet to OP HPI pump CV-1407.

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 4-R2

Event No.: 5 & 6
Continued

Event Description:

- **The operating EH pump breaker will trip causing a loss of EH fluid and a main turbine trip >43% power.**
- **RPS is failed and will not cause an automatic trip.**

Time / Comments	Position	Applicant's Actions or Behavior
	ATC	Adjust Pressurizer Level Control setpoint to 100".
	BOP	Check for proper electrical response.
	ANY	Check OP HPI pump supplying normal Makeup and Seal Injection.
	ATC	Check both SG levels remain ≤ 410 ".
	ANY	Check Instrument Air Header press ≥ 75 psi.
	ATC	Check all NNI power available.
	ATC	Check all ICS power available.
	ATC	Check SG press ≥ 900 psig.
	ATC	Check MSSV OPEN alarm clear (K07-C5).
	ATC	Check MSIVs open.
EXAMINER NOTE This event is complete when the MSIVs are checked open OR as directed by the Lead Evaluator		

Op-Test No.: 2010-1		Scenario No.: 4-R2		Event No.: 7 & 8	
Event Description: A ~210 GPM tube rupture will develop in the ‘B’ SG requiring initiation of HPI.					
Time / Comments		Position	Applicant’s Actions or Behavior		
Crew checks MSIV open		ANY	Recognize SG tube rupture on the ‘B’ SG. TS 3.4.13 Condition B		
		CRS	Transition to 1202.006 Tube Rupture.		
		CRS	Direct operations per 1202.006 Tube Rupture step 25.		
		ATC	Manually Trip Rx, Verify all rods inserted and Reactor power dropping. (Already performed in RX Trip EOP)		
		BOP	Manually trip Turbine, Verify Turbine throttle and governor valves closed. (Already performed in RX Trip EOP)		
		ANY	Check adequate SCM (Already performed in RX Trip EOP)		
		CRS	Advise Shift Manager to Notify Nuclear Chemistry to begin off-site dose projections and Implement Emergency Action Level Classification (1903.010). EAL NUE 3.2 S/G Tube Rupture > Tech. Spec. Limits EAL ALERT 2.2 RCS Leakage > Normal Makeup Capacity (50 gpm)		
		BOP	Open BWST Outlet to OP HPI pump CV-1407. (Already performed)		
		ATC	Reduce Letdown by closing Orifice Bypass. (Already performed)		
		BOP	Adjust Header Pressure Controller setpoint to 45%.		
		ATC	Check TURB BYP valves controlling SG press 950 to 990 psig.		
		ATC	Operate Pressurizer Heaters AND Pressurizer Spray valve (CV-1008) to maintain RCS press low within limits of Figure 3.		
		ATC, BOP	WHEN RCS press is <1700 psig, THEN bypass ESAS.		
		BOP	Verify OTSG N-16 monitors selected to Gross. (Pull N16 drawer out and verify toggle switch on back side of card in Gross position)		

CONTINUED

Op-Test No.: 2010-1	Scenario No.: 4-R2	Event No.: 7 & 8 Continued
Event Description: A ~210 GPM tube rupture will develop in the 'B' SG requiring initiation of HPI.		
Time / Comments	Position	Applicant's Actions or Behavior
	ANY	Recognize Lowering PZR level
	BOP	Initiate RT2 HPI CT criteria – HPI should be initiated before SCM is lost. (This step may not be reached depending upon crew response)
	ANY	Determine 'B' as bad SG.
	CRS	Direct AO to perform Control of Secondary System Contamination (1203.014) in conjunction with this procedure.
	ATC	Select 'B' SG to indicate on Header press recorder.
	ATC	Verify EFW pump Turbine (K3) Steam Supply CV-2617 from 'B' SG in MANUAL closed.
	ANY	Check adequate SCM.
	ANY	Check ESAS Actuation alarms clear on K11.
	ANY	Check at least one RCP per loop running.
	BOP	Trip P32B.
	ATC	Establish RCS cooldown rate of $\leq 100^{\circ}\text{F/hr}$ on 'A' SG, <ul style="list-style-type: none"> Place 'A' SG TBV's in hand and open to establish cooldown.
	ATC	Control RCS press low within limits of Figure 3 (RT 14).
	ATC	Bypass ESAS at ~1700#
EXAMINER NOTE If asked report, "Radiation levels at the site boundary are <Alert criteria."		
EXAMINER NOTE This event is complete when an RCS cooldown and depressurization have been started OR as directed by the Lead Evaluator		

Op-Test No.: 2010-1	Scenario No.: 4-R2	Event No.: 9
Event Description: Operating HPI pump breaker trips due to a motor fault		
Time / Comments	Position	Applicant's Actions or Behavior
EXAMINER NOTE		
Crew can start either the Standby or the ES HPI pump.		
55 Steps to restart HPI using the ES standby pump	ANY	Recognize and report P36A HPI pump trip.
	BOP	Establish HPI on the ES pump using 1202.012 RT-2 HPI.
	BOP	Open BWST Outlet to ES HPI pump (CV-1408).
	BOP	Verify both HPI RECIRC valves open (CV-1300 and 1301)
	BOP	Start P64C AUX Lube Oil pump for ES HPI pump.
	BOP	Verify RCP Seal INJ Block (CV-1206) closed.
	BOP	When BWST Outlet is open, Then start ES HPI pump.
	BOP	Stop P64C AUX Lube Oil pump
	BOP	Open HPI Block valve associated with ES HPI pump (CV-1285) to maintain PZR level and RCS press (modulating valves).
	BOP	If PZR level or RCS press continues to drop, Then open additional HPI Block valves associated with ES HPI pump: CV-1227, CV-1228, CV-1284.
ATC	Monitor MUT level and control per step 2.J as necessary. Close HPI pump recirculation valve CV-1300 or CV-1301.	
EXAMINER NOTE		
When asked report as AO, “‘A’ HPI pump breaker A306 has an instantaneous overcurrent relay tripped.”		
When asked report as WCO, “‘A’ HPI pump motor is very hot.”		

CONTINUED

Op-Test No.: 2010-1		Scenario No.: 4-R2	Event No.: 9 CONTINUED
Event Description: Operating HPI pump breaker trips due to a motor fault			
Time / Comments	Position	Applicant's Actions or Behavior	
EXAMINER NOTE			
Crew can start either the Standby or the ES HPI pump.			
Steps to start STBY HPI pump per RT2.	BOP	Establish HPI on the STBY HPI pump using 1202.012 RT-2 HPI.	
	BOP	Open BWST Outlet to STBY HPI pump (CV-1407).	
	BOP	Verify RCP Seal Inj Block (CV-1206) closed.	
	BOP	Close RCS Makeup Block valve (CV-1233 or CV-1234)	
	BOP	Verify both HPI RECIRC valves open (CV-1300 and 1301)	
		Verify the following selected to A3: <ul style="list-style-type: none">• P36B Bus Select MOD• P64B Transfer Switch	
	BOP	Start P64B AUX Lube Oil pump for STBY HPI pump.	
	BOP	Start STBY HPI pump.	
	BOP	Stop P64B AUX Lube Oil pump	
	BOP	When BWST outlet is open, then open HPI Block valve associated with STBY HPI pump.	
	BOP	If PZR level or RCS press continues to drop, Then open additional HPI Block valves associated with STBY HPI pump.	
EXAMINER NOTE			
When asked report as AO, “A’ HPI pump breaker A306 has an instantaneous overcurrent relay tripped.”			
When asked report as WCO, “A’ HPI pump motor is very hot.”			

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 4-R2

Event No.: 9

CONTINUED

Event Description: **Operating HPI pump breaker trips due to a motor fault**

Time / Comments	Position	Applicant's Actions or Behavior
Steps to start STBY HPI pump per 1203.026 Section 1	BOP	Place Standby HPI pump in service per 1203.026 Section 1 or 1202.012 RT-2 HPI
	BOP	Isolate letdown by performing either of the following: <ul style="list-style-type: none"> • Close Letdown Coolers Outlet (CV-1221), • Close Letdown Cooler Outlets (RCS) (CV-1214 AND CV-1216).
	BOP	Verify RC pump seals are being cooled by ICW.
	BOP	Prepare to restart an HPI pump as follows: <ul style="list-style-type: none"> Place the following valves in HAND AND close: <ul style="list-style-type: none"> • RC Pumps Total INJ Flow (CV-1207) • Pressurizer Level Control (CV-1235) Verify RCP Seal Injection Block (CV-1206) closes.
	BOP	Select Safety System Diagnostic Inst display on SPDS for OP HPI pump AND evaluate suction pressure and flow stability prior to event. (HPI pump did not loose suction)
	BOP	Start Aux lube oil pump for STBY HPI pump.
	BOP	If necessary, Then vent pump as follows (HPI pump venting is not required)
	BOP	Verify HPI pump suction pressure >10 psig. (Suction pressure will be >10 psig)
	ATC	Verify the following valves in HAND AND closed: <ul style="list-style-type: none"> • CV-1207 • CV-1235
	BOP	When Aux lube oil pump has run for >1 minute, Then start HPI pump.
	BOP	Stop Aux lube oil pump for HPI pump.
	EXAMINER NOTE When called report as WCO, "HPI pump not rotating."	
	BOP	Check stopped HPI pump for reverse rotation. (HPI pump is not rotating in reverse)
	ATC	Place CV-1206 pushbutton in OVRD (OVRD light on).
	ATC	Open CV-1206.

CONTINUED

Op-Test No.: 2010-1

Scenario No.: 4-R2

Event No.: 9

CONTINUED

Event Description: **Operating HPI pump breaker trips due to a motor fault**

Time / Comments	Position	Applicant's Actions or Behavior
	ATC	Slowly open CV-1207 as follows: <ul style="list-style-type: none"> Adjust CV-1207 for 30-40 gpm Place CV-1207 in AUTO.
	ATC	When RCP Seals Total INJ Flow is above setpoint (CV-1206 FLOW light on), Then return CV-1206 OVRD pushbutton to normal (OVRD light off).
	ATC	Slowly open CV-1235 until makeup flow indication is on-scale
	ATC	Adjust CV-1235 setpoint to desired value
	ATC	Place CV-1235 in AUTO.
	BOP	Restore letdown per Repetitive Tasks (1202.012), Restore Letdown (RT-13).
	CRS	Initiate repairs for failed HPI pumps and components.
	CRS	Refer to TS 3.5.2 for limiting conditions for operation (LCO).

EXAMINER NOTE

This scenario is complete when an HPI pump is started and supplying HPI

OR

as directed by the Lead Evaluator

Supporting Documents in Sequential Order (Scenario 1, 2, 3, and 4-the spare), including the shift turnover sheet and supporting procedure(s) for normal evolutions.

ANO Unit 1 Initial Exam March 2010

UNIT 1 SHIFT RELIEF SHEET

Computer Generated Form (ref. 1015.015)

Page 1 of 2

Date: TODAY		Shift: Days		Crew: Yours	
Plant Power: 30%		Plant Mode: 1		Days online: 250	
Maintenance Train: Green		Risk: Minimal			
Unit 1 Reactivity Control Parameters:					
EFPD	250.1	RCS Boron 680 ppm	Reactivity Change last shift:	2	ppm
Delith	0 min	PZR Boron 685 ppm	Reactivity Change expected for next shift:	2	ppm
					Dilution
					100 gal makeup / no conc. change:
					95 gal
					Water
					5 gal
					Acid
Control Rod Index: 182.0%		APSR position: 30%		ULD setpoint: 30.0%	
				Auto	
Any unplanned power maneuvers will be using ICS in auto or manual referencing the contingency reactivity plans located in the Plant Data Book and the network.					
HuPig HOT TOPIC: Post Job Briefs: Engagement during evolution Configuration Control Critique Procedure			Component Mispositioning Alarm toggle switch on K24 Service Air Compressor Annunciator Panel found in "OFF" during rounds. Suspect component was bumped. CR-ANO-1-2010-0202.		
SPECIFICATIONS IN EFFECT: (TS/TRM/ODCM/FS etc.)					
<ul style="list-style-type: none"> None 					
Indefinite/Conditional <ul style="list-style-type: none"> None 			Post RX Trip Contingencies <ul style="list-style-type: none"> Open CA-113, BA Supply to Batch Controller (for Boration) Close CV-6640, Spillover Bypass Close CS-27, Polisher Bypass 		
			Post Accident Contingencies <ul style="list-style-type: none"> None 		
CONTROL ROOM ALARM STATUS:					
<ul style="list-style-type: none"> K10-B5 CFT 'B' Press HI/LO 					
EVOLUTIONS IN PROGRESS (List continuous action steps, parameters being monitored, frequency, and individual responsible)					
<ul style="list-style-type: none"> Plant at ~30% power for repairs to 'B' MFP thrust bearing. Power was lowered to ~30% for TV-GV testing. Plant at ~30% for past 2 days and is at equilibrium XENON. C28A IA compressor OOS for motor cleaning 'B' CFT low pressure alarm received late in previous shift 					
EVOLUTIONS COMPLETED			EVOLUTIONS SCHEDULED		
<ul style="list-style-type: none"> Washed Traveling Screens TV-GV testing 			<ul style="list-style-type: none"> Add N2 to 'B CFT to raise pressure to ~585# per 1104.001 Core Flood System Operating Procedure step 11.0. Raise power to ~35% per 1102.004 Power Operations step 7.5. RX Engineering direction is to use control rods to raise power. 		
Equipment OOS for EOOS			Protected equipment per COPD-13 Att J or Applicable Checklist		
<ul style="list-style-type: none"> CA-113 (BA Pump outlet to Batch Controller) closed for CA-74. C28A IA compressor. 			<ul style="list-style-type: none"> CRD/Computer Room C28B IA compressor 		
EQUIPMENT CONFIGURATION CONTROL CHANGES: (past 12 hours)					
<u>ESL</u>		<u>Tagging</u>		<u>Cat E</u>	
<ul style="list-style-type: none"> None 		<ul style="list-style-type: none"> None 		<ul style="list-style-type: none"> None 	
				<u>Cntmt Pent</u>	
				<ul style="list-style-type: none"> None 	
				<u>Caution Tags</u>	
				<ul style="list-style-type: none"> None 	

UNIT 1 SHIFT RELIEF SHEET

Computer Generated Form (ref. 1015.015)

Page 2 of 2

CARRYOVER ITEMS:

- 'B' MFP thrust bearing replacement maintenance
- C28A IA compressor overhaul

WMC COMMUNICATIONS:

- None

DELAYED SURVEILLANCES / EVOLUTIONS / WORK PLANS:

Procedure	Step no. / status of procedure	Location of procedure	Reason	Due Date	Late date	Owner
N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	

NEW INSTRUCTIONS/PROCEDURE CHANGES:

- None

(a)(1) SYSTEMS

- Aux Building
- 120V Vital A/C
- Chilled Water
- Reactor Building
- Decay Heat
- Control Rod Drive
- Reactor Coolant System
- Service Air
- Diverse Reactor Overpressure Protection
- 4160 V SWGR
- FW Pump Lube Oil

CHEMISTRY / RADIOLOGICAL PROTECTION

- Chemistry has changed the hydrazine target band. New hydrazine target is ≥ 6 times oxygen. 5x is the EPRI limit, 6x is the Admin limit.
- Feedwater conductivity band per Chemistry is 13-15 uMhos.

OTHER UNIT IMPACT:

- None

SIGNIFICANT LOG DEFICIENCIES:

- None

UNIT ONE OWAs (Operator Work Arouds):

- Numerous valves in the Boric Acid Supply to the Batch Controller are leaking by, resulting in piping dilution. Manual isolation using CA-113, Boric Acid to Batch Controller Isolation Valve, has been implemented as an interim measure. (2-14-09)

Watch Station	Deficiencies	Scheduled

OFF-GOING SHIFT SIGNATURE CRS/SM

Use the following list as a placekeeping tool for review of items for shift turnover. Check off the items applicable to your watch station. Review appropriate index on first day back and then use the past 12 hour section.

Temporary Modification Log (SM,CRS,STA,RO)	Status Board (ALL)
Standing orders (ALL)	Clearance/ Caution Tagout Review (ALL)
TS/TRM/ODCM/FS Review (ALL)	Annunciator OOS Log (SM,CRS,STA,RO)
Station Log Review (ALL)	Board Walk down (SM,CRS,STA,RO)
Category E Valve Log (ALL)	Maintenance Schedule (SM,CRS)
Equipment Status Log (ALL)	Key Ring (RO, NLO)
Current SWYD/Transformer Yard Impact Statements (SM, CRS)	Key Log and Key Cabinet Key (SM)
Watch stander review Out of Spec logs (RO, NLO)	

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE

**TITLE: CORE FLOOD SYSTEM OPERATING
PROCEDURE**

DOCUMENT NO.
1104.001

CHANGE NO.
039

SET #

WORK PLAN EXP. DATE
N/A

SAFETY-RELATED
☒ YES ☐ NO

IPTE
☐ YES ☒ NO

TEMP MOD
☐ YES ☒ NO

LEVEL OF USE
☒ CONTINUOUS
☐ REFERENCE
☐ INFORMATIONAL

PROGRAMMATIC EXCLUSION PER EN-LI-100
☐ YES ☒ NO

When you see these TRAPS

Get these TOOLS

Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)

Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover

VERIFIED BY

DATE

TIME

FORM TITLE:

VERIFICATION COVER SHEET

FORM NO.
1000.006A

CHANGE NO.
054

PROC./WORK PLAN NO. 1104.001	PROCEDURE/WORK PLAN TITLE: CORE FLOOD SYSTEM OPERATING PROCEDURE	PAGE: 24 of 121 CHANGE: 039
---------------------------------	---	--------------------------------

11.0 Pressurizing Core Flood Tanks

CAUTION

When RCS is opened for refueling or maintenance and either CFT is pressurized, the potential exists for hazardous high pressure release through the RCS opening in the event the core flood tank isolation valves were to open.

11.1 Initial Conditions

11.1.1 Both Core Flood Tanks (T-2A and T-2B) are filled and bled as required for operation.

11.1.2 CFTs at or below normal operating pressure
OR
Pressurizing CFTs has been called for by Plant Startup (1102.002), "Preparation for Heatup" section.

11.1.3 Core flood system aligned per System Alignment Verification section of 1015.001, Conduct of Operations.

NOTE

One (1) nitrogen tank (T-81A - L) is set aside specifically for the filling of CFTs for meeting the Tech Spec pressure requirement.

11.1.4 Align High Pressure Nitrogen per Exhibit A "Nitrogen Manifold Operations" of 1104.009.

11.1.5 Open High Pressure Nitrogen Supply Header Isol (N₂-2).

PROC./WORK PLAN NO. 1104.001	PROCEDURE/WORK PLAN TITLE: CORE FLOOD SYSTEM OPERATING PROCEDURE	PAGE: 25 of 121 CHANGE: 039
---------------------------------	---	--------------------------------

NOTE

Step 11.3 (CFT "B"), may be performed prior to step 11.2 (CFT "A").

11.2 *NA* IF pressurizing CFT T-2A,
THEN perform the following:

CAUTION

If opening High Pressure N₂ Supply to CFT T-2A/T-2B (N₂-3/N₂-5) in Mode 5—6, then Containment Closure Control, Attachment G of Decay Heat Removal and LTOP System Control (1015.002) applies. Category E/Locked Component Controls are required if in force.

11.2.1 *NA* IF in Modes 1—4,
THEN station a dedicated individual at N₂-3 (or low-dose area 354' elev U1 Aux Bldg) with direct communication with the Control Room, to remain in area while N₂-3 is open.

11.2.2 *NA* IF in Modes 5—6,
THEN perform one of the following:

- Station a dedicated individual at N₂-3 (or low dose area 354' elev U1 Aux Bldg) with direct communication with the Control Room, to remain in area while N₂-3 is open.
- Complete a Containment Closure Determination Sheet (Form 1015.002C).

11.2.3 *NA* IF Category E/Locked Component controls are in effect,
THEN make appropriate entry in Category E/Locked Component Log (E-DOC 1015.001H).

CAUTION

- Do not exceed 140 psig until tank temperature verified > 65°F.
- CFT NDTT limit will be exceeded if nitrogen temperature is > 100°F below CFT metal temperature (ambient RB temperature) and CFT pressure is > 25 psig.

11.2.4 *NA* Unlock AND open High Pressure Nitrogen Supply to CFT T-2A (N₂-3).

A. IF ESAS actuates,
THEN immediately close AND lock N₂-3. ←

11.2.5 *NA* WHEN T-2A is between 580 and 620 psig,
THEN close AND lock N₂-3.

A. Secure dedicated individual.

11.2.6 *NA* IF desired to pressurize T-2B,
THEN GO TO step 11.3.
OTHERWISE GO TO step 11.4 to secure system.

PROC./WORK PLAN NO. 1104.001	PROCEDURE/WORK PLAN TITLE: CORE FLOOD SYSTEM OPERATING PROCEDURE	PAGE: 26 of 121 CHANGE: 039
-------------------------------------	---	--------------------------------

- 11.3 IF pressurizing CFT T-2B,
 THEN perform the following:

CAUTION

If opening High Pressure N₂ Supply to CFT T-2B/T-2A (N₂-5/N₂-3) in Mode 5—6, then Containment Closure Control, Attachment G of Decay Heat Removal and LTOP System Control (1015.002) applies. Category E/Locked Component controls are required if in force.

- 11.3.1 IF in Modes 1—4,
 THEN station a dedicated individual at N₂-5 (or low-dose area 354' elev U1 Aux Bldg) with direct communication with the Control Room, to remain in area while N₂-5 is open.
- 11.3.2 IF in Modes 5—6,
 THEN perform one of the following:
- Station a dedicated individual at N₂-5 (or low dose area 354' elev U1 Aux Bldg) with direct communication with the Control Room, to remain in area while N₂-5 is open.
 - Complete a Containment Closure Determination Sheet (Form 1015.002C).
- 11.3.3 IF Category E/Locked Component controls are in effect,
 THEN make appropriate entry in Category E/Locked Component Log (E-DOC 1015.001H).

CAUTION

- Do not exceed 140 psig until tank temperature verified > 65°F.
- CFT NDTT limit will be exceeded if nitrogen temperature is > 100°F below CFT metal temperature (ambient RB temperature) and CFT pressure is > 25 psig.

- 11.3.4 Unlock AND open High Pressure Nitrogen Supply to CFT T-2B (N₂-5).
- A. IF ESAS actuates,
 THEN immediately close AND lock N₂-5.
- 11.3.5 WHEN T-2B is between 580 and 620 psig,
 THEN close AND lock N₂-5.
- A. Secure dedicated individual.
- 11.3.6 IF desired to pressurize T-2A,
 THEN GO TO step 11.2.
 OTHERWISE GO TO step 11.4 to secure system.



PROC./WORK PLAN NO. 1104.001	PROCEDURE/WORK PLAN TITLE: CORE FLOOD SYSTEM OPERATING PROCEDURE	PAGE: 27 of 121 CHANGE: 039
--	--	--

11.4 Close N₂-2.

11.5 Perform the following:

- IF applicable,
THEN update Containment Closure controls (Forms 1015.002C/D).
- IF Category E/Locked Component controls are in effect,
THEN perform independent verification AND make appropriate entries in Category E/Locked Component Log (E-DOC 1015.001H).
- Secure High Pressure Nitrogen per Exhibit A "Nitrogen Manifold Operations" of 1104.009.

12.0 Normal Operation

12.1 WHEN opening CFT isolation valves as RCS pressure goes up during startup,
THEN monitor CFTs level AND pressure to detect check valve leakage.

12.1.1 IF in-leakage from RCS prevents maintaining CFT boron concentration
OR CFT level limit
OR CFT pressure limit,
THEN close CF isolation valves AND enter applicable Tech Spec Condition.

12.1.2 Notify OPS Manager and evaluate corrective action.

12.2 Adjust CFT(s) level and pressure as necessary per applicable section of this procedure to within limits of CBO Turbine log OPS-A6.

12.3 Monthly, sample each CFT as requested by Chemistry for proper boron concentration per "Recirculation and Sampling" or "Sampling CFTs" section of this procedure.

12.3.1 Adjust CFT(s) boron concentration as necessary per applicable section of this procedure to within limits of section 5.0.

NOTE

SR 3.5.1.4 requires CFT sampling within 12 hours of CFT level addition of ≥ 0.2 feet that is not the result of addition from a borated water source of known concentration ≥ 2270 ppm.

12.4 After each CFT makeup that requires sampling, sample CFT for proper boron concentration per "Recirculation and Sampling" or "Sampling CFTs" section of this procedure.

**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

TITLE: POWER OPERATION

**DOCUMENT NO.
1102.004**

**CHANGE NO.
048**

**WORK PLAN EXP. DATE
N/A**

SET #

**SAFETY-RELATED
☒ YES ☐ NO**

**IPTE
☒ YES ☐ NO**

**TEMP MOD
☒ YES ☐ NO**

**LEVEL OF USE
☒ CONTINUOUS
☐ REFERENCE
☐ INFORMATIONAL**

**PROGRAMMATIC EXCLUSION PER EN-LI-100
☐ YES ☒ NO**

When you see these TRAPS

Get these TOOLS

**Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)**

**Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover**

VERIFIED BY

DATE

TIME

FORM TITLE:

VERIFICATION COVER SHEET

**FORM NO.
1000.006A**

**CHANGE NO.
054**

PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 10 of 65 CHANGE: 048
---------------------------------	---	-------------------------------

7.0 Power Escalation

INITIAL

7.1

Initial Conditions - May be performed in any logical order.

7.1.1

IF this power escalation is a power maneuver $\geq 30\%$ which the Operations Manager has identified as an IPTE, THEN with Senior Line Management in attendance, the Shift Manager or designee shall conduct a crew brief in accordance with Infrequently Performed Tests or Evolutions EN-OP-116, Attachments 9.4 and 9.5. Additionally, the following shall be emphasized:

Procedure review by key personnel

Assignment of procedural tasks

Possible actions that will require assistance from other plant departments and manpower availability

Specific parameters that will require monitoring

Procedural hold points

Limits at which evolution shall be terminated if reached

Impact to overall plant safety

Self and additional verification

Describe what could go wrong and actions to be taken

A. Ensure turnover sheet identifies that an IPTE brief is needed for each crew involved with either the power maneuver, or T-ave restoration.

7.1.2

Reactor power $\geq 25\%$.

7.1.3

Two (2) Condensate Pumps in-service.

P-2A

P-2B

• P-2C

PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 11 of 65 CHANGE: 048
---------------------------------	--	-------------------------------

~~7.1.4~~

Circulating Water Pumps in-service as required to maintain CW discharge temperature within limits of Exceeding Thermal Limits on Condenser Discharge Water (1203.008).

• P-3A
• P-3B

• P-3C
• P-3D

~~7.1.5~~

Unit Load Demand (ULD) HI-Load Limit set no greater than 36% (360 MWe) before second MFWP is placed into service.

~~7.1.6~~

ULD LO-Load Limit set at 20% (200 MWe).

~~7.1.7~~

Plant parameters within limits of following:

- ~~•~~ Attachment D, RCS Allowable Temp Deviation vs. Power
- ~~•~~ Attachment E, SG Outlet Press Deviation vs. Power
- ~~•~~ Attachment F, Steam Temperature vs. Power
- ~~•~~ Attachment H, SG Operate Range vs. Power
- ~~•~~ Attachment I, Total Feedwater Flow vs. Power
- ~~•~~ Attachment J, Feedwater Temperature vs. Power Level
- ~~•~~ Attachment N, Turbine Generator Capability Curve
- ~~•~~ COLR, Regulating Rod Insertion Limits
- ~~•~~ COLR, Axial Power Imbalance Setpoints For Full In-Core Conditions

NOTE

Initial conditions of Condensate, Feedwater, and Steam System Operation (1106.016), "Heater Drain Pump (P-8A and P-8B) Startup" section are not required to be met to warm Heater Drain Pumps.

~~7.2~~

IF Heater Drain Pumps (P-8A, P-8B) will be placed into service,
THEN begin warming pumps per Condensate, Feedwater, and Steam System Operation (1106.016), "Heater Drain Pump (P-8A and P-8B) Startup" section.

PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 12 of 65 CHANGE: 048
---------------------------------	---	-------------------------------

CAUTION /u

Under non-steady state operating conditions, an NI calibration is required daily (SR 3.3.1.2). A 50% power level change could cause nuclear instrumentation to be inaccurate by as much as 5% due to change in cold leg temperature.

7.3 Transfer plant auxiliaries to the Unit Auxiliary Transformer per Electrical System Operations (1107.001), "Startup Transformer Operations" section. /u

7.4 Verify morpholine injection system in-service to control FW pH per "Startup and Normal Operation" section of Secondary System Chemical Addition (1106.028). /u

NOTE

Maintaining reactor maneuvering rates of Attachment L will also ensure the less restrictive turbine maneuvering rates specified by Westinghouse are maintained.

7.5 Determine maximum rate of escalation and required power level hold points per Attachment L, "Reactor Maneuvering Limits".

7.6 While continuing power escalation, perform the following:

CAUTION

Power maneuvering requires close attention to prevent exceeding Control Rod Index Limits.

7.6.1 CBOR compare rod index with a copy of the applicable page of the COLR Regulating Rod Insertion Limits ~ every 15 minutes to verify limits are not exceeded. ←

7.6.2 Provide the control board operator a copy of the applicable page of the COLR Axial Power Imbalance Setpoints For Full In-Core Conditions to verify limits are not exceeded. —

7.6.3 IF prior to end-of-cycle APSR withdrawal, THEN adjust APSRs per the following guidance:

- During steady state conditions, adjust APSRs to maintain axial power imbalance at or as near 0 as practical at all times, unless Reactor Engineering has recommended otherwise. —
- During transient conditions, adjust APSRs to maintain axial power imbalance as recommended by Reactor Engineering. —

PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 13 of 65 CHANGE: 048
---------------------------------	--	-------------------------------

7.6.4 Observe Reactor Maneuvering limits of Attachment L. ←

7.6.5 Reference Attachments D through J as needed for information concerning expected plant parameters. ←

CAUTION

If either Unit 1 or Unit 2 diesel generator is paralleled to the grid, adjusting Main Generator reactive loading may result in significant changes in EDG reactive loading.

7.6.6 Maintain generator H₂ pressure and reactive loading within OPS Log Posting AB (CBO Turbine Generator Checks). ←

NOTE

- DROPS (AMSAC) is automatically enabled at 45% power as detected by Gamma Metrics Linear Power instruments.
- When enabled, AMSAC trips the turbine and will initiate EFW when both MFW loop flow rates are $<0.90 \times 10^6$ lbm/hr (15% of 6.0×10^6 lbm/hr).

7.6.7 Monitor both Gamma Metrics Linear Power indications on SPDS (NI1LP and NI2LP). ←

A. Verify MFW flow is $>0.90 \times 10^6$ lbm/hr prior to Gamma Metrics Linear Power rising above 45% power. —

7.6.8 IF available,
THEN perform the following:

- Monitor Heat Balance power on plant computer point XPP. ←
- Compare Heat Balance power with nuclear instrumentation. ←

A. IF difference becomes $>4\%$,
THEN notify Shift Manager to evaluate need for performing an NI calibration. ←

PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 14 of 65 CHANGE: 048
--	--	---

7.7 Prior to exceeding 30% power, notify Chemistry to ensure SG chemistry meets requirements of Steam Generator Water Chemistry Monitoring -- Unit One (1000.042). _____

7.7.1 IF SG chemistry is NOT within limits of 1000.042, THEN stabilize power ≤30% power until limits of 1000.042 are met. _____

7.8 WHEN 225 MWe (~35% power) is reached, THEN place Moisture Separator Reheaters into service per "Placing Reheaters into service" section of this procedure. _____

NOTE

- Between ~40% and ~60% power, plant response can cause oscillations in primary and secondary parameters including erratic +/-1% swings in neutron error. If oscillations become excessive then consideration should be given to placing RX Demand H/A Station in manual per 1105.004 (Ref. CR-ANO-1-2005-1421).
- Second MFW pump may be placed into service at a lower plant load, if desirable, based on previous operating characteristics.

7.9 WHEN ~350 MWe is reached
OR prior to reaching 90% open on Low Load Control Valve demand,
THEN perform the following:

7.9.1 Place second MFWP (P-1A or P-1B) into service per Condensate, Feedwater And Steam System Operation (1106.016), "Placing MFWPs Into service" section. _____

7.9.2 Set ULD HI-Load Limit to ~15 MWe greater than expected electrical generation. _____

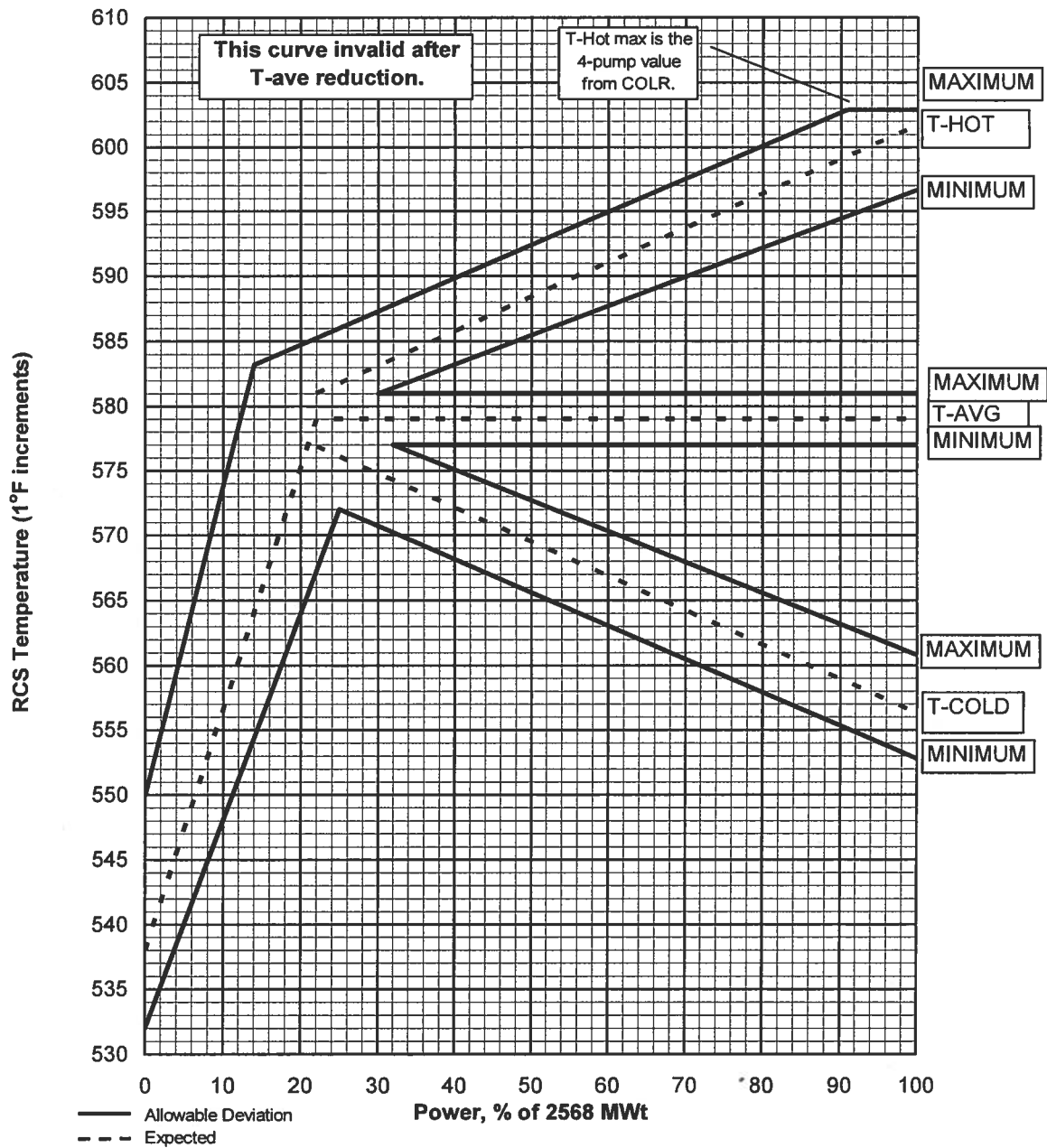
7.10 WHEN only three RCPs are operating and loop FW flow is $>1.2 \times 10^6$ lbm/hour in the loop with the idle RCP, THEN if desired, place Main Feed pump H/A station in AUTO for corresponding loop. _____

PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 39 of 65 CHANGE: 048
---------------------------------	---	-------------------------------

ATTACHMENT D

Page 1 of 1

RCS Allowable Temperature Deviation vs. Power

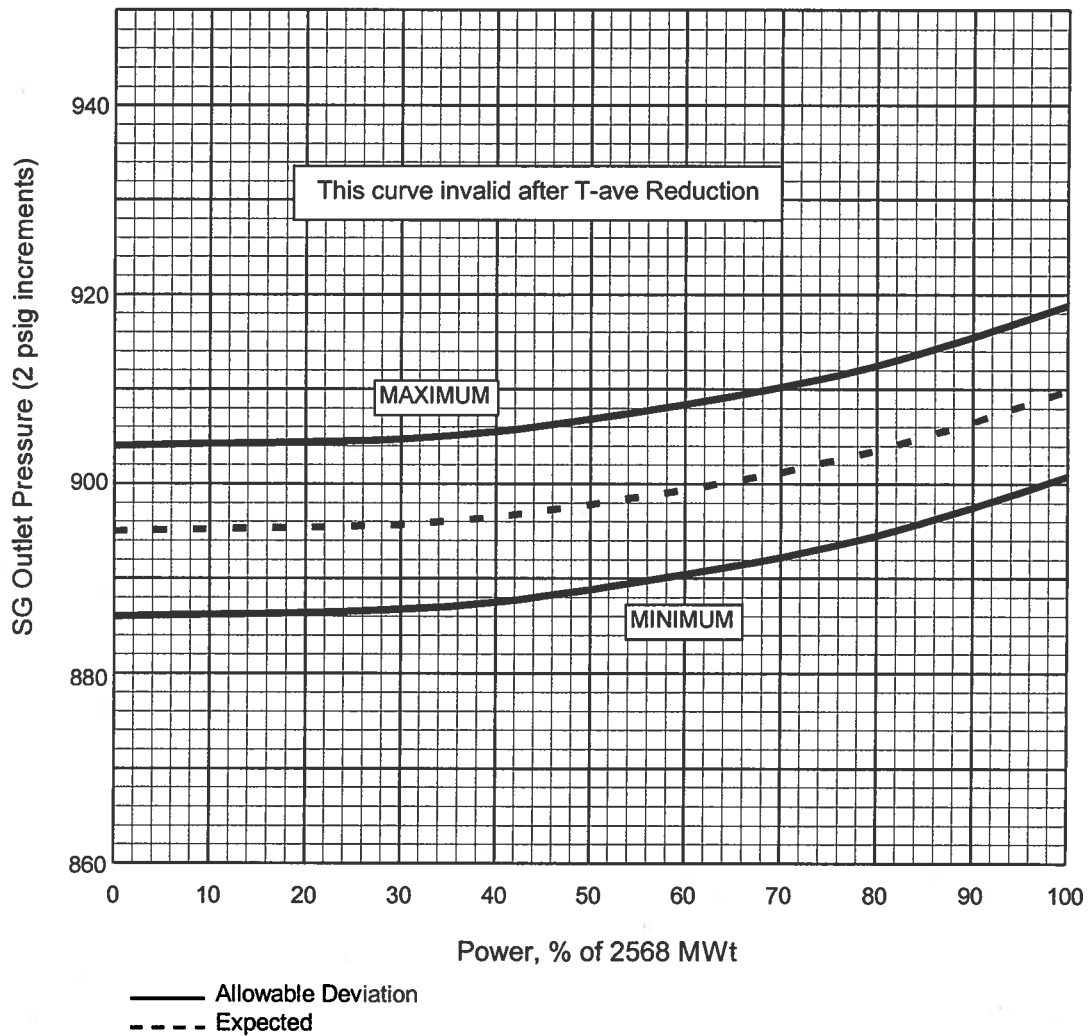


PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 40 of 65 CHANGE: 048
--	--	---

ATTACHMENT E

Page 1 of 1

Steam Generator Outlet Pressure Deviation vs. Power

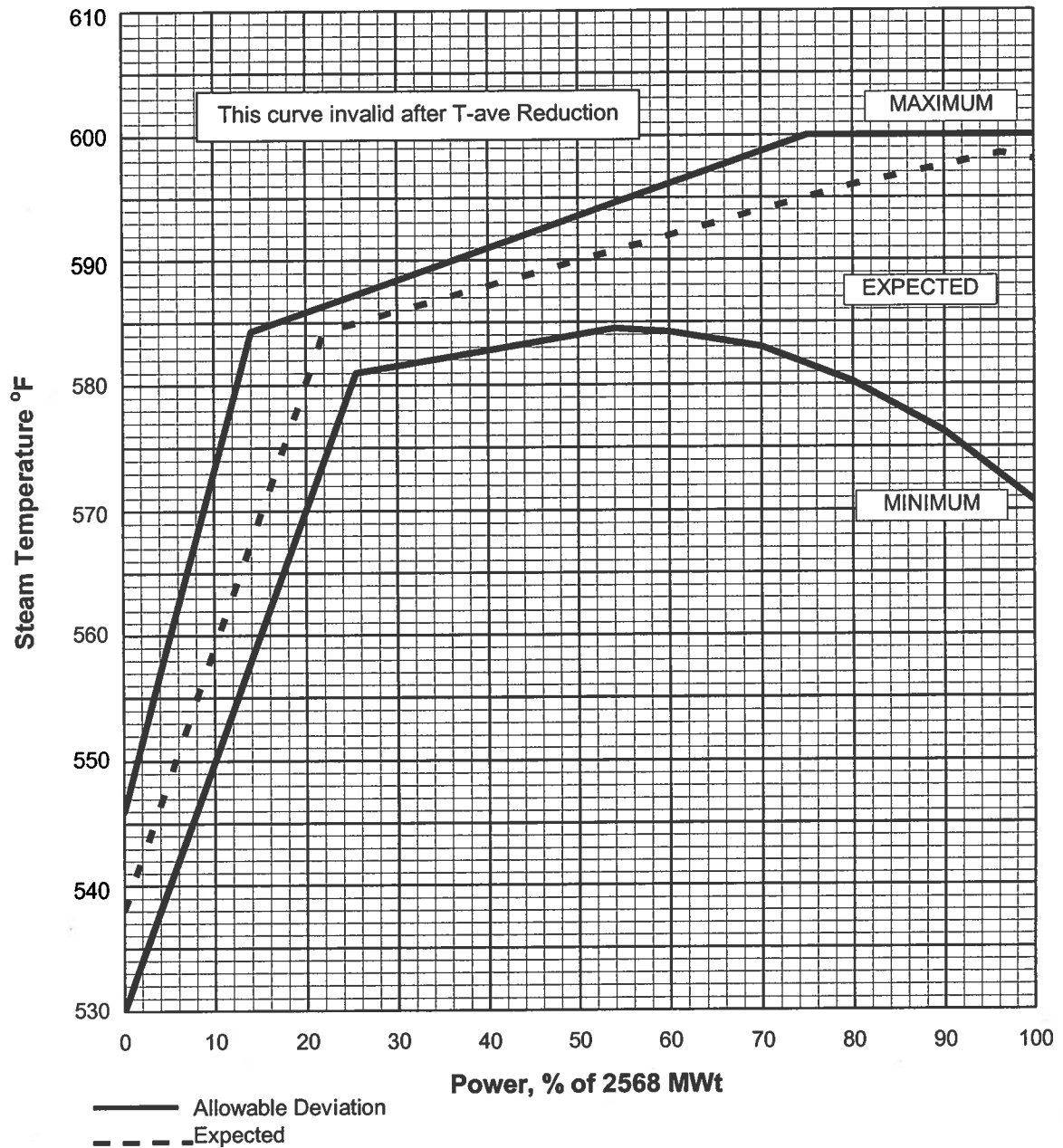


PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 41 of 65 CHANGE: 048
---------------------------------	---	-------------------------------

ATTACHMENT F

Page 1 of 1

Steam Temperature vs. Power

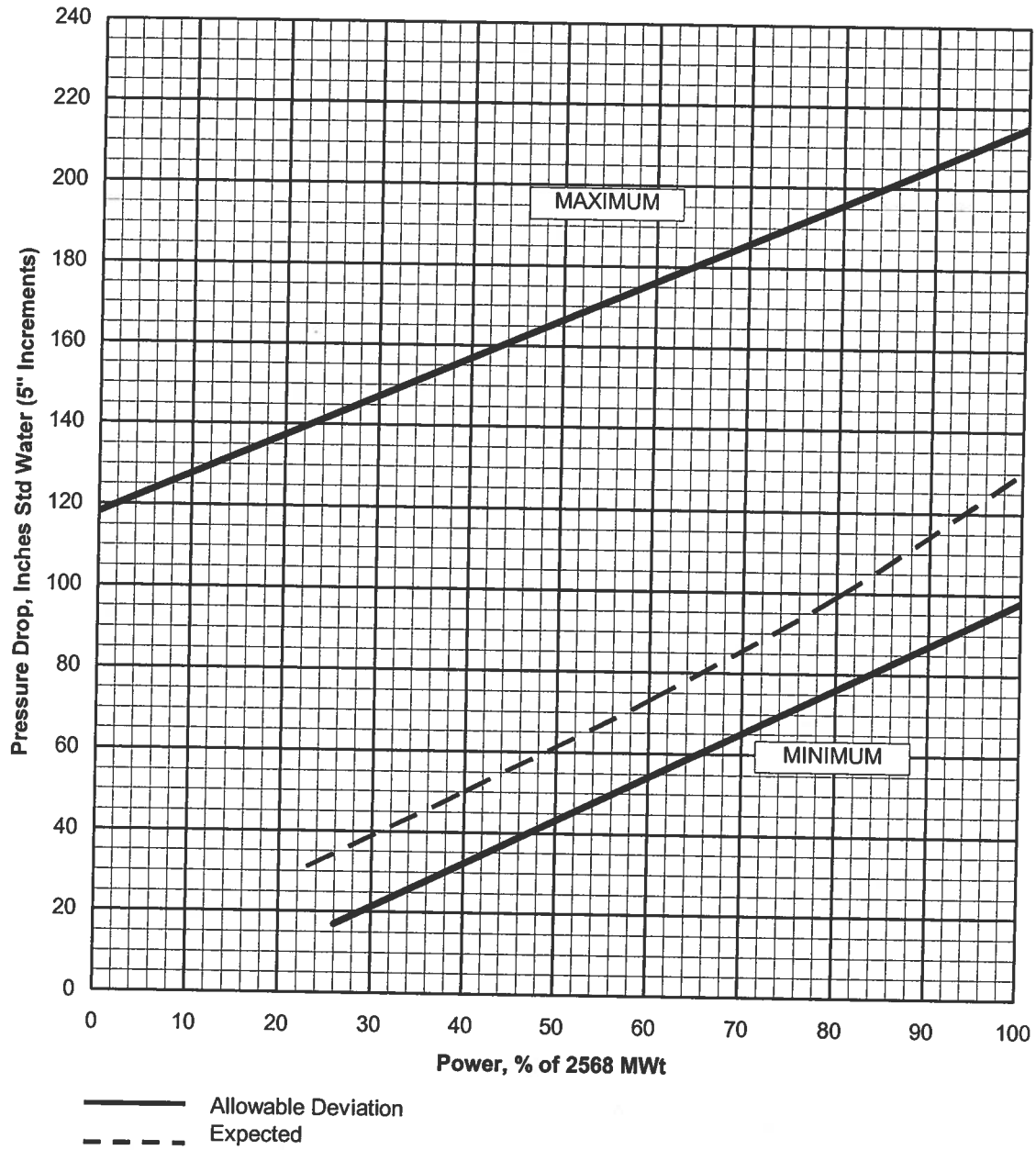


PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 42 of 65 CHANGE: 048
---------------------------------	---	-------------------------------

ATTACHMENT G

Page 1 of 1

SG Startup Range Level DP vs. Power

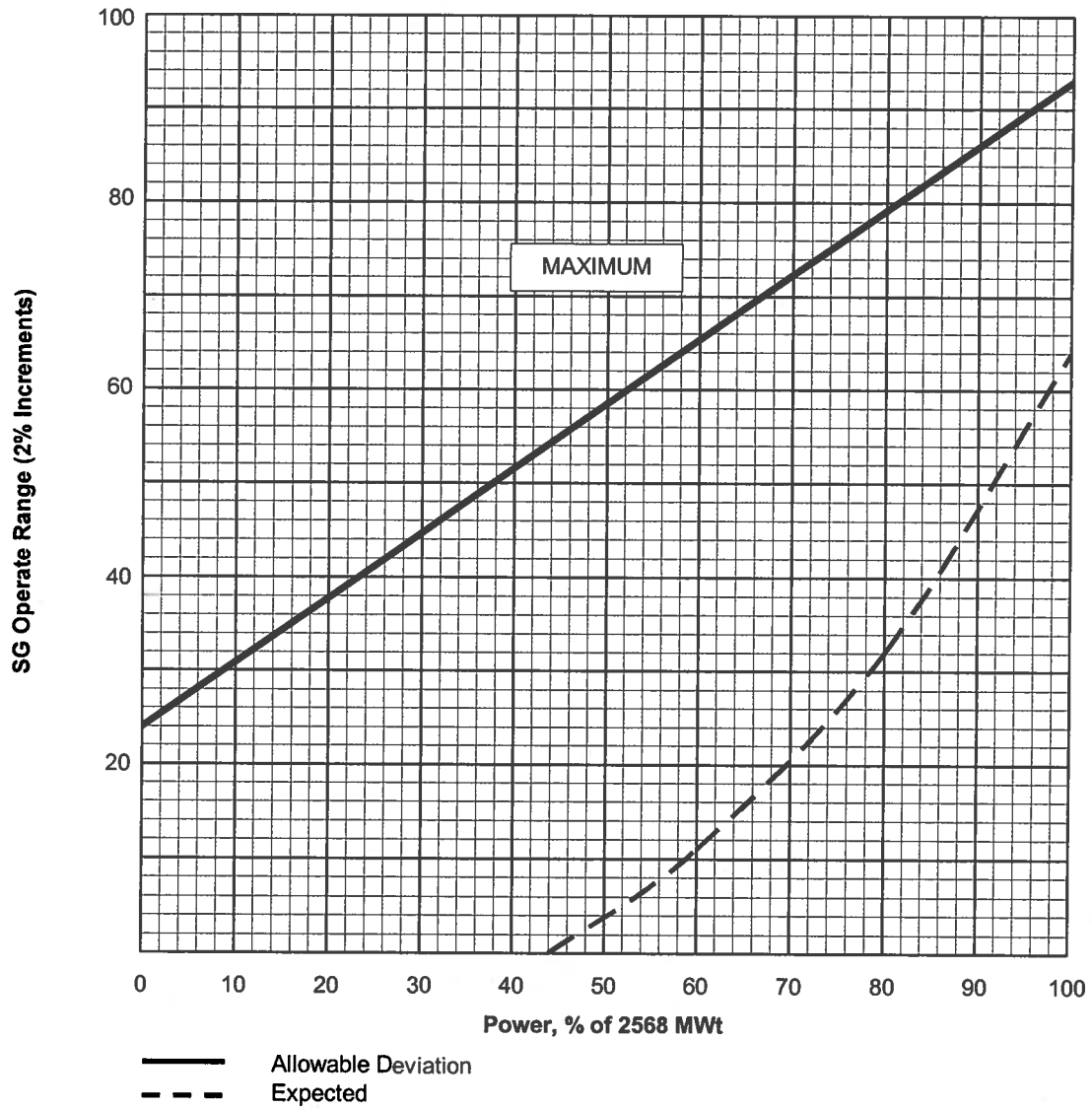


PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 43 of 65 CHANGE: 048
---------------------------------	---	-------------------------------

ATTACHMENT H

Page 1 of 1

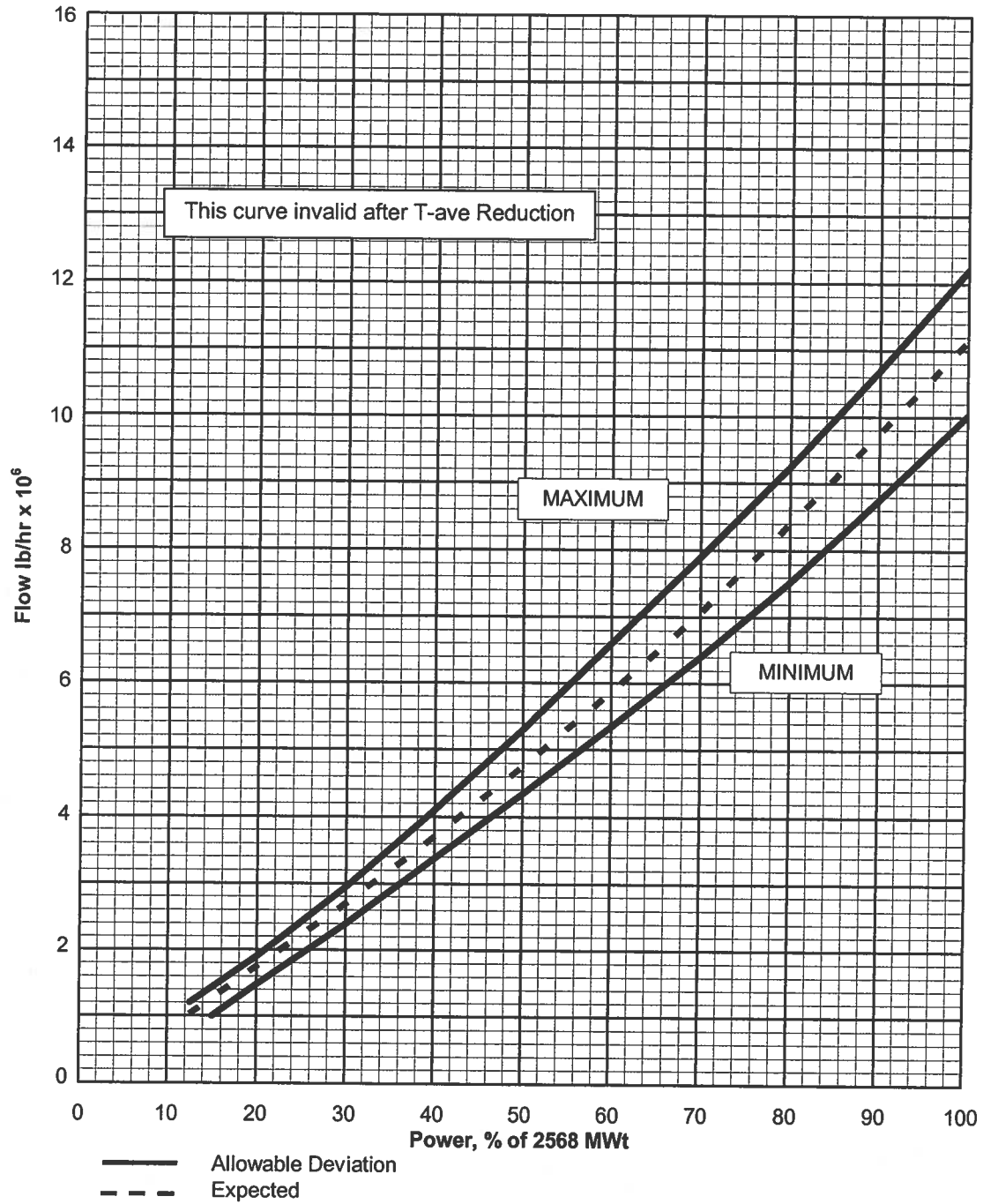
SG Operate Range Level vs. Power



ATTACHMENT I

Page 1 of 1

Total Feedwater Flow vs. Power

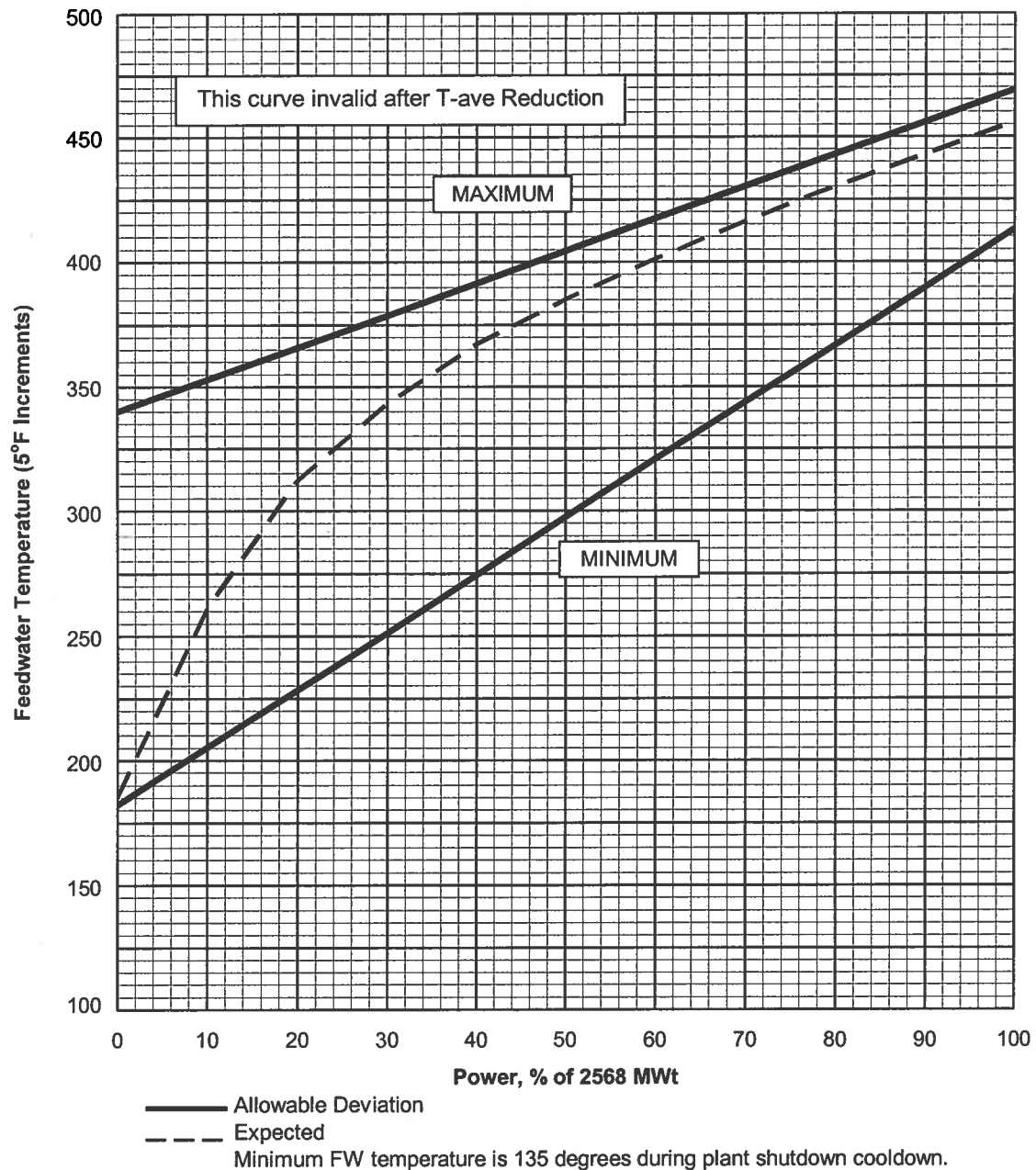


PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 45 of 65 CHANGE: 048
---------------------------------	---	-------------------------------

ATTACHMENT J

Page 1 of 1

Feedwater Temperature vs. Power Level



PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 46 of 65 CHANGE: 048
---------------------------------	--	-------------------------------

ATTACHMENT L

Page 1 of 2

REACTOR MANEUVERING RECOMMENDATIONS

Reactor Engineering personnel may be consulted as necessary for further recommendations not covered in this attachment.

Power maneuvers can be performed using rods, boration and dilution as required.

1.0 POWER ESCALATION

During a startup with a significant xenon concentration in the core, imbalance will be positive. Group 7 rods may be inserted to ~50% withdrawn during the startup to aid in imbalance control to ~40% FP.

1.1 Power Escalation Limits

- Table L1 shows the maximum rates for power escalation. Slower rates should be used as feasible.
- For power histories not listed below, the "<50% power for <96 hours" rates may be used.
- Power levels listed in the table below assume 4-RCP operation. For 3-RCP operation, use 75% of the listed power level bands (example: 0%-40% becomes 0%-30%, 40%-60% becomes 30%-45%, etc.)

TABLE L1 - POWER ESCALATION LIMITS					
Power History	0%-40% Power	40%-60% Power	60%-90% Power	90%-98% Power	98%-100% Power
<50% power for <96 hours *	≤30%/hr	≤30%/hr	≤30%/hr	≤30%/hr	≤5%/hr
<50% power for >96 hours *	≤30%/hr	≤30%/hr	≤15%/hr	≤5%/hr	≤5%/hr
Initial startup after refueling	≤30%/hr	≤5%/hr	≤5%/hr	≤3%/hr	≤3%/hr
Dropped rod recovery <8 hrs after rod drop	≤30%/hr	≤30%/hr	≤30%/hr	≤30%/hr	≤5%/hr
Dropped rod recovery 8 to 24 hrs after rod drop	≤30%/hr	≤30%/hr	≤15%/hr	≤5%/hr	≤5%/hr
Dropped rod recovery >24 hrs after rod drop	≤3%/hr	≤3%/hr	≤3%/hr	≤3%/hr	≤3%/hr
* The 96 hours applies only to time the Rx is critical and <50%. Time the Rx is subcritical shall not be applied to the 96 hours.					

PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 47 of 65 CHANGE: 048
---------------------------------	--	-------------------------------

ATTACHMENT L

Page 2 of 2

1.2 Step Changes in Power

- Although the power escalation rates of Table L1 are expressed in % full power per hour, the operator should strive to control the reactor power change at a smooth and constant rate per minute as is practical. For example, if the allowed power escalation rate is 30%FP/hr and power is to be raised 15%, the operator should strive to accomplish the power change at a constant rate over at least 30 minutes.
- Step changes in reactor power are measured in any continuous time period of five minutes or less. Step changes in power that meet the Step Change Definition of Table L2 below must be followed by a 10-minute hold at constant power level before further power escalation. Although step changes are allowed as defined, they should be minimized.

TABLE L2 - STEP CHANGE DEFINITION	
Allowable Rate of Escalation from Table L1	Step Change Requiring a 10-minute hold
30%/hour	Power escalation of >5% in ≤5 minutes
15%/hour	Power escalation of >3.75% in ≤5 minutes
5%/hour	Power escalation of >1.25% in ≤5 minutes
3%/hour	Power escalation of >0.75% in ≤5 minutes

UNIT 1 SHIFT RELIEF SHEET

Computer Generated Form (ref. 1015.015)

Page 1 of 2

Date: TODAY			Shift: Days			Crew: Yours			
Plant Power: 80%			Plant Mode: 1			Days online: 250			
Maintenance Train: Green			Risk: Minimal						
Unit 1 Reactivity Control Parameters:									
EFPD	250.1	RCS Boron 680 ppm	Reactivity Change last shift:	2	ppm	Dilution	100 gal makeup / no conc. change:	95 gal	Water
Delith	0 min	PZR Boron 685 ppm	Reactivity Change expected for next shift:	2	ppm	Dilution		5 gal	Acid
Control Rod Index: 174.0%			APSR position: 26%				ULD setpoint: 80.0%		Auto
Any unplanned power maneuvers will be using ICS in auto or manual referencing the contingency reactivity plans located in the Plant Data Book and the network.									
HuPIG HOT TOPIC: Post Job Briefs: <i>Engagement during evolution</i> <i>Configuration Control</i> <i>Critique Procedure</i>					Component Mispositioning Alarm toggle switch on K24 Service Air Compressor Annunciator Panel found in "OFF" during rounds. Suspect component was bumped. CR-ANO-1-2010-0202.				
SPECIFICATIONS IN EFFECT: (TS/TRM/ODCM/FS etc.)									
<ul style="list-style-type: none"> None 									
Indefinite/Conditional <ul style="list-style-type: none"> None 					Post RX Trip Contingencies <ul style="list-style-type: none"> Open CA-113, BA Supply to Batch Controller (for Boration) Close CV-6640, Spillover Bypass Close CS-27, Polisher Bypass 				
					Post Accident Contingencies <ul style="list-style-type: none"> None 				
CONTROL ROOM ALARM STATUS:									
<ul style="list-style-type: none"> None 									
EVOLUTIONS IN PROGRESS (List continuous action steps, parameters being monitored, frequency, and individual responsible)									
<ul style="list-style-type: none"> C28A OOS for overhaul 									
EVOLUTIONS COMPLETED					EVOLUTIONS SCHEDULED				
<ul style="list-style-type: none"> Washed Traveling Screens 					<ul style="list-style-type: none"> Engineering has requested operations to perform generator field ground test per 1102.004 Step 8.11 				
Equipment OOS for EOOS					Protected equipment per COPD-13 Att J or Applicable Checklist				
<ul style="list-style-type: none"> CA-113 (BA Pump outlet to Batch Controller) closed for CA-74. C28A IA compressor 					<ul style="list-style-type: none"> CRD/Computer Room C28B IA compressor 				
EQUIPMENT CONFIGURATION CONTROL CHANGES: (past 12 hours)									
<u>ESL</u>		<u>Tagging</u>		<u>Cat E</u>		<u>Contmt Pent</u>		<u>Caution Tags</u>	
<ul style="list-style-type: none"> None 		<ul style="list-style-type: none"> None 		<ul style="list-style-type: none"> None 		<ul style="list-style-type: none"> None 		<ul style="list-style-type: none"> None 	

UNIT 1 SHIFT RELIEF SHEET

Computer Generated Form (ref. 1015.015)

Page 2 of 2

CARRYOVER ITEMS:						
<ul style="list-style-type: none"> C28A 1A compressor overhaul 						
WMC COMMUNICATIONS:						
<ul style="list-style-type: none"> None 						
DELAYED SURVEILLANCES / EVOLUTIONS / WORK PLANS:						
Procedure	Step no. / status of procedure	Location of procedure	Reason	Due Date	Late date	Owner
N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	
NEW INSTRUCTIONS/PROCEDURE CHANGES:			(a)(1) SYSTEMS			
<ul style="list-style-type: none"> None 			<ul style="list-style-type: none"> Aux Building 120V Vital A/C Chilled Water Reactor Building Decay Heat Control Rod Drive Reactor Coolant System Service Air Diverse Reactor Overpressure Protection 4160 V SWGR FW Pump Lube Oil 			
CHEMISTRY / RADIOLOGICAL PROTECTION						
<ul style="list-style-type: none"> Chemistry has changed the hydrazine target band. New hydrazine target is ≥ 6 times oxygen. 5x is the EPRI limit, 6x is the Admin limit. Feedwater conductivity band per Chemistry is 13-15 uMhos. 						
OTHER UNIT IMPACT						
<ul style="list-style-type: none"> None 						
SIGNIFICANT LOG DEFICIENCIES:						
<ul style="list-style-type: none"> None 						
UNIT ONE OWAs (Operator Work Arouds):						
<ul style="list-style-type: none"> Numerous valves in the Boric Acid Supply to the Batch Controller are leaking by, resulting in piping dilution. Manual isolation using CA-113, Boric Acid to Batch Controller Isolation Valve, has been implemented as an interim measure. (2-14-09) 						
Watch Station	Deficiencies	Scheduled				
OFF-GOING SHIFT SIGNATURE CRS/SM						
Use the following list as a placekeeping tool for review of items for shift turnover. Check off the items applicable to your watch station. Review appropriate index on first day back and then use the past 12 hour section.						
Temporary Modification Log (SM,CRS,STA,RO)			Status Board (ALL)			
Standing orders (ALL)			Clearance/ Caution Tagout Review (ALL)			
TS/TRM/ODCM/FS Review (ALL)			Annunciator OOS Log (SM,CRS,STA,RO)			
Station Log Review (ALL)			Board Walk down (SM,CRS,STA,RO)			
Category E Valve Log (ALL)			Maintenance Schedule (SM,CRS)			
Equipment Status Log (ALL)			Key Ring (RO, NLO)			
Current SWYD/Transformer Yard Impact Statements (SM, CRS)			Key Log and Key Cabinet Key (SM)			
Watch stander review Out of Spec logs (RO, NLO)						

**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

TITLE: POWER OPERATION

SET #

DOCUMENT NO.
1102.004

CHANGE NO.
048

WORK PLAN EXP. DATE
N/A

SAFETY-RELATED
☒ YES ☐ NO

IPTE
☒ YES ☐ NO

TEMP MOD
☒ YES ☐ NO

LEVEL OF USE
☒ CONTINUOUS
☐ REFERENCE
☐ INFORMATIONAL

PROGRAMMATIC EXCLUSION PER EN-LI-100
☐ YES ☒ NO

When you see these TRAPS

Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)

Get these TOOLS

Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover

VERIFIED BY

DATE

TIME

FORM TITLE:

VERIFICATION COVER SHEET

FORM NO.
1000.006A

CHANGE NO.
054

PROC./WORK PLAN NO. 1102.004	PROCEDURE/WORK PLAN TITLE: POWER OPERATION	PAGE: 29 of 65 CHANGE: 048
--	--	---

8.11 Generator Field Ground Test

8.11.1 Momentarily place Gen Field Ground Test Switch in Test and release.

8.11.2 Verify the following:

- Test Brush Solenoid Actuated Lamp illuminates.
- Generator Field Ground (K04-C6) does not alarm.

9.0 Manual ICS Operation at Power

9.1 Manual control of ICS or EHC subsystems may be initiated whenever deemed advisable by the operator.

9.2 IF a subsystem's calculating functions have failed
OR the subsystem is to be removed for maintenance,
THEN manual control of that system shall be initiated.

9.3 Control of any subsystem or station shall be exercised in order to maintain its state, conditions, or output value compatible with plant status.

9.4 To restore automatic control to a subsystem, refer to Integrated Control System (1105.004), "Auto Manual Transfers" section.

10.0 Placing Reheaters into Service

10.1 Initial Conditions

10.1.1 ~35% power. _____

10.1.2 Reheater control system in reset. _____

10.1.3 MSR main steam supply lines warming. _____

10.2 Before proceeding, verify power raised to ~40% (270MWe).

10.3 Verify main steam lines warm downstream of MSR A&C MS Isol (CV-6864) and MSR B&D MS Isol (CV-6865) by checking the following steam traps passing steam:

- MSR 2nd Stage Steam Inlet Drain Trap A&C MSR (ST-125) _____
- MSR 2nd Stage Steam Inlet Drain Trap B&D MSR (ST-126) _____

10.4 WHEN main steam lines are verified warm,
THEN place the following handswitches to open at Polisher Regen Panel (C111):

- HS-6864 (MSR E12A/C Inlet Isol MOV [CV-6864]) _____
- HS-6865 (MSR E12B/D Inlet Isol MOV [CV-6865]) _____

UNIT 1 SHIFT RELIEF SHEET

Computer Generated Form (ref. 1015.015)

Page 1 of 2

Date: Today			Shift: Days			Crew: Yours			
Plant Power: 100%			Plant Mode: 1			Days online: 250			
Maintenance Train: Green			Risk: Minimal						
Unit 1 Reactivity Control Parameters:									
EFPD	250.1	RCS Boron 604 ppm	Reactivity Change last shift:	2	ppm	Dilution	100 gal makeup / no conc. change:	95 gal	Water
Delith	0 min	PZR Boron 610 ppm	Reactivity Change expected for next shift:	2	ppm	Dilution		5 gal	Acid
Control Rod Index: 290.0%			APSR position: 30%			ULD setpoint: 99.8%			Auto
Any unplanned power maneuvers will be using ICS in auto or manual referencing the contingency reactivity plans located in the Plant Data Book and the network.									
HuPIG HOT TOPIC: Post Job Briefs: Engagement during evolution Configuration Control Critique Procedure					Component Mispositioning Alarm toggle switch on K24 Service Air Compressor Annunciator Panel found in "OFF" during rounds. Suspect component was bumped. CR-ANO-1-2010-0202.				
SPECIFICATIONS IN EFFECT: (TS/TRM/ODCM/FS etc.)									
<ul style="list-style-type: none"> 3.8.1.B #2 EDG OOS for air start motor replacement 									
Indefinite/Conditional <ul style="list-style-type: none"> None 					Post RX Trip Contingencies <ul style="list-style-type: none"> Open CA-113, BA Supply to Batch Controller (for Boration) Close CV-6640, Spillover Bypass Close CS-27, Polisher Bypass 				
					Post Accident Contingencies <ul style="list-style-type: none"> None 				
CONTROL ROOM ALARM STATUS:									
<ul style="list-style-type: none"> K01 C4 DG2 Critical Trouble K01D3 EDG2 not available 									
EVOLUTIONS IN PROGRESS (List continuous action steps, parameters being monitored, frequency, and individual responsible)									
<ul style="list-style-type: none"> #2 EDG Outage for air start motor replacement C28A OOS for overhaul 									
EVOLUTIONS COMPLETED					EVOLUTIONS SCHEDULED				
<ul style="list-style-type: none"> Washed Traveling Screens 					<ul style="list-style-type: none"> Place electric fire pump in service for fire brigade training 				
Equipment OOS for EOOS					Protected equipment per COPD-13 Att J or Applicable Checklist				
<ul style="list-style-type: none"> CA-113 (BA Pump outlet to Batch Controller) closed for CA-74. C28A IA compressor 					<ul style="list-style-type: none"> CRD/Computer Room C28B IA compressor 				
EQUIPMENT CONFIGURATION CONTROL CHANGES: (past 12 hours)									
ESL		Tagging		Cat E		Cntmt Pent		Caution Tags	
<ul style="list-style-type: none"> None 		<ul style="list-style-type: none"> None 		<ul style="list-style-type: none"> None 		<ul style="list-style-type: none"> None 		<ul style="list-style-type: none"> None 	

UNIT 1 SHIFT RELIEF SHEET

Computer Generated Form (ref. 1015.015)

Page 2 of 2

CARRYOVER ITEMS:

- #2 EDG maintenance
C28A IA compressor overhaul

WMC COMMUNICATIONS:

- None

DELAYED SURVEILLANCES / EVOLUTIONS / WORK PLANS:

Procedure	Step no. / status of procedure	Location of procedure	Reason	Due Date	Late date	Owner
N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	

NEW INSTRUCTIONS/PROCEDURE CHANGES:

(a)(1) SYSTEMS

- None
- Aux Building
- 120V Vital A/C
- Chilled Water
- Reactor Building
- Decay Heat
- Control Rod Drive
- Reactor Coolant System
- Service Air
- Diverse Reactor Overpressure Protection
- 4160 V SWGR
- FW Pump Lube Oil

CHEMISTRY / RADIOLOGICAL PROTECTION

- Chemistry has changed the hydrazine target band. New hydrazine target is ≥ 6 times oxygen. 5x is the EPRI limit, 6x is the Admin limit.
- Feedwater conductivity band per Chemistry is 13-15 uMhos.

OTHER UNIT IMPACT

- None

SIGNIFICANT LOG DEFICIENCIES:

- None

UNIT ONE OWAs (Operator Work Arouds):

- Numerous valves in the Boric Acid Supply to the Batch Controller are leaking by, resulting in piping dilution. Manual isolation using CA-113, Boric Acid to Batch Controller Isolation Valve, has been implemented as an interim measure. (2-14-09)

Watch Station	Deficiencies	Scheduled

OFF-GOING SHIFT SIGNATURE CRS/SM

Use the following list as a placekeeping tool for review of items for shift turnover. Check off the items applicable to your watch station. Review appropriate index on first day back and then use the past 12 hour section.

Temporary Modification Log (SM,CRS,STA,RO)		Status Board (ALL)	
Standing orders (ALL)		Clearance/ Caution Tagout Review (ALL)	
TS/TRM/ODCM/FS Review (ALL)		Annunciator OOS Log (SM,CRS,STA,RO)	
Station Log Review (ALL)		Board Walk down (SM,CRS,STA,RO)	
Category E Valve Log (ALL)		Maintenance Schedule (SM,CRS)	
Equipment Status Log (ALL)		Key Ring (RO, NLO)	
Current SWYD/Transformer Yard Impact Statements (SM, CRS)		Key Log and Key Cabinet Key (SM)	
Watch stander review Out of Spec logs (RO, NLO)			

**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

TITLE: FIRE PROTECTION SYSTEMS

DOCUMENT NO.
1104.032

CHANGE NO.
062

WORK PLAN EXP. DATE
N/A

SET #

SAFETY-RELATED
☒ YES ☐ NO

IPTE
☐ YES ☒ NO

TEMP MOD
☒ YES ☐ NO

LEVEL OF USE
☒ CONTINUOUS
☐ REFERENCE
☐ INFORMATIONAL

PROGRAMMATIC EXCLUSION PER EN-LI-100
☐ YES ☒ NO

When you see these TRAPS

Get these TOOLS

Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)

Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover

VERIFIED BY

DATE

TIME

FORM TITLE:

VERIFICATION COVER SHEET

FORM NO.
1000.006A

CHANGE NO.
054

PROC./WORK PLAN NO. 1104.032	PROCEDURE/WORK PLAN TITLE: FIRE PROTECTION SYSTEMS	PAGE: 23 of 235 CHANGE: 062
---------------------------------	--	--------------------------------

CAUTION

- Rapid repressurization of any portion of the fire water and sprinkler system may result in water hammer or inadvertent sprinkler actuation.
- IF the fire water system is depressurized up to a deluge system valve (a system employing open sprinkler heads), isolate the deluge valve before filling, venting and pressurizing the system.

NOTE

- The main outer and Turbine Bldg loops for both units are now operational. Sub-section 7.4 will place the remainder of the fire water system into operation for Unit 1.
- Unit 2 OPS should be consulted to complete placing their portions of the system into operation.

7.4 Place each de-pressurized branch line into service as follows:

- 7.4.1 Slowly fill, vent, and repressurize the branch line up to the isolation valve immediately before the water flow actuation device (e.g. deluge valve).
- 7.4.2 Place the water flow actuation device into operation by following the appropriate reset section of this procedure.
- 7.4.3 IF any deluge valves tripped during system recharge, THEN reset tripped valves per appropriate section of this procedure.

NOTE

- When the Fire Water Suppression system is used for Fire Brigade training, one Fire Pump (P-6A or P-6B) must be operable and a second pump must be operating (P-6A, P-6B or Temp).
- Both Fire Pumps (P-6A and P-6B) should be operable when the Fire Water Suppression system is used for wash down or other miscellaneous activities. If only one pump (P-A or P-6B) is available, contact Fire Protection Engineering prior to using water from the system for activities other than Fire Brigade training.
- P-6A start may be performed without a procedure in hand per (EN-OP-115). P-6A start is designated as Informational use per Procedure Adherence and Level of Use (EN-AD-102).

7.5 IF needed for firefighting, firewater system surveillance, fire brigade training, etc., OR to prevent unneeded autostarts, THEN start the desired Firewater Pump from C19 as follows:

- 7.5.1 IF desired to start P-6A from C19, THEN place P-6A handswitch (HS-3603) to start.
 - A. Verify recirc flow through Discharge Relief (PSV-3602).

UNIT 1 SHIFT RELIEF SHEET

Computer Generated Form (ref. 1015.015)

Page 1 of 2

Date: Today	Shift: Days	Crew: Yours
Plant Power: 100%	Plant Mode: 1	Days online: 250
Maintenance Train: Green	Risk: Minimal	

Unit 1 Reactivity Control Parameters:

EFPD	250.1	RCS Boron 604 ppm	Reactivity Change last shift:	2	ppm	Dilution	100 gal makeup / no conc. change:	95 gal	Water
Delith	0 min	PZR Boron 610 ppm	Reactivity Change expected for next shift:	2	ppm	Dilution		5 gal	Acid

Control Rod Index: 290.0%

APSR position: 30%

ULD setpoint: 99.8%

Auto

Any unplanned power maneuvers will be using ICS in auto or manual referencing the contingency reactivity plans located in the Plant Data Book and the network.

HuPIG HOT TOPIC:

Post Job Briefs:

Engagement during evolution
Configuration Control
Critique Procedure

Component Mispositioning

Alarm toggle switch on K24 Service Air Compressor
Annunciator Panel found in "OFF" during rounds. Suspect
component was bumped. CR-ANO-1-2010-0202.

SPECIFICATIONS IN EFFECT: (TS/TRM/ODCM/WFS etc.)

- None

Indefinite/Conditional

- None

Post RX Trip Contingencies

- Open CA-113, BA Supply to Batch Controller (for Boration)
- Close CV-6640, Spillover Bypass
- Close CS-27, Polisher Bypass

Post Accident Contingencies

- None

CONTROL ROOM ALARM STATUS:

- None

EVOLUTIONS IN PROGRESS (List continuous action steps, parameters being monitored, frequency, and individual responsible)

- C28A OOS for overhaul

EVOLUTIONS COMPLETED		EVOLUTIONS SCHEDULED	
<ul style="list-style-type: none"> • Washed Traveling Screens 		<ul style="list-style-type: none"> • Place EH Oil Pump P14A in service for PMT 	
Equipment OOS for EOOS		Protected equipment per COPD-13 Att J or Applicable Checklist	
<ul style="list-style-type: none"> • CA-113 (BA Pump outlet to Batch Controller) closed for CA-74. • C28A IA compressor 		<ul style="list-style-type: none"> • CRD/Computer Room • C28B IA compressor 	
EQUIPMENT CONFIGURATION CONTROL CHANGES: (past 12 hours)			
<u>ESL</u>	<u>Tagging</u>	<u>Cat E</u>	<u>Cntmt Pent</u>
• None	• None	• None	• None
<u>Caution Tags</u>			
• None			

UNIT 1 SHIFT RELIEF SHEET

Computer Generated Form (ref. 1015.015)

Page 2 of 2

CARRYOVER ITEMS:

- C28A IA compressor overhaul

WMC COMMUNICATIONS:

- None

DELAYED SURVEILLANCES / EVOLUTIONS / WORK PLANS:

Procedure	Step no. / status of procedure	Location of procedure	Reason	Due Date	Late date	Owner
N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	

NEW INSTRUCTIONS/PROCEDURE CHANGES:

(a)(1) SYSTEMS

- None

- Aux Building
- 120V Vital A/C
- Chilled Water
- Reactor Building
- Decay Heat
- Control Rod Drive
- Reactor Coolant System
- Service Air
- Diverse Reactor Overpressure Protection
- 4160 V SWGR
- FW Pump Lube Oil

CHEMISTRY / RADIOLOGICAL PROTECTION

- Chemistry has changed the hydrazine target band. New hydrazine target is ≥ 6 times oxygen. 5x is the EPRI limit, 6x is the Admin limit.
- Feedwater conductivity band per Chemistry is 13-15 uMhos.

OTHER UNIT IMPACT

- None

SIGNIFICANT LOG DEFICIENCIES:

- None

UNIT ONE OWAs (Operator Work Arouds):

- Numerous valves in the Boric Acid Supply to the Batch Controller are leaking by, resulting in piping dilution. Manual isolation using CA-113, Boric Acid to Batch Controller Isolation Valve, has been implemented as an interim measure. (2-14-09)

Watch Station	Deficiencies	Scheduled

OFF-GOING SHIFT SIGNATURE CRS/SM

Use the following list as a placekeeping tool for review of items for shift turnover. Check off the items applicable to your watch station. Review appropriate index on first day back and then use the past 12 hour section.

Temporary Modification Log (SM,CRS,STA,RO)		Status Board (ALL)	
Standing orders (ALL)		Clearance/ Caution Tagout Review (ALL)	
TS/TRM/ODCM/FS Review (ALL)		Annunciator OOS Log (SM,CRS,STA,RO)	
Station Log Review (ALL)		Board Walk down (SM,CRS,STA,RO)	
Category E Valve Log (ALL)		Maintenance Schedule (SM,CRS)	
Equipment Status Log (ALL)		Key Ring (RO, NLO)	
Current SWYD/Transformer Yard Impact Statements (SM, CRS)		Key Log and Key Cabinet Key (SM)	
Watch stander review Out of Spec logs (RO, NLO)			

**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

**TITLE: ELECTRO-HYDRAULIC OIL SYSTEM
OPERATIONS**

**DOCUMENT NO.
1106.012**

**CHANGE NO.
018**

SET #

**WORK PLAN EXP. DATE
N/A**

**SAFETY-RELATED
☒ YES ☐ NO**

**IPTE
☐ YES ☒ NO**

**TEMP MOD
☐ YES ☒ NO**

**LEVEL OF USE
☒ CONTINUOUS
☐ REFERENCE
☐ INFORMATIONAL**

**PROGRAMMATIC EXCLUSION PER EN-LI-100
☐ YES ☒ NO**

When you see these TRAPS

Get these TOOLS

Time Pressure
Distraction/Interruption
Multiple Tasks
Over Confidence
Vague or Interpretive Guidance
First Shift/Last Shift
Peer Pressure
Change/Off Normal
Physical Environment
Mental Stress (Home or Work)

Effective Communication
Questioning Attitude
Placekeeping
Self Check
Peer Check
Knowledge
Procedures
Job Briefing
Coaching
Turnover

VERIFIED BY

DATE

TIME

FORM TITLE:

VERIFICATION COVER SHEET

**FORM NO.
1000.006A**

**CHANGE NO.
054**

PROC./WORK PLAN NO. 1106.012	PROCEDURE/WORK PLAN TITLE: ELECTRO-HYDRAULIC OIL SYSTEM OPERATIONS	PAGE: 18 of 24 CHANGE: 018
---------------------------------	---	-------------------------------

14.0 EH Oil Pump (P-14A and P-14B) Operation

14.1 Perform the following for EH oil pump rotation:

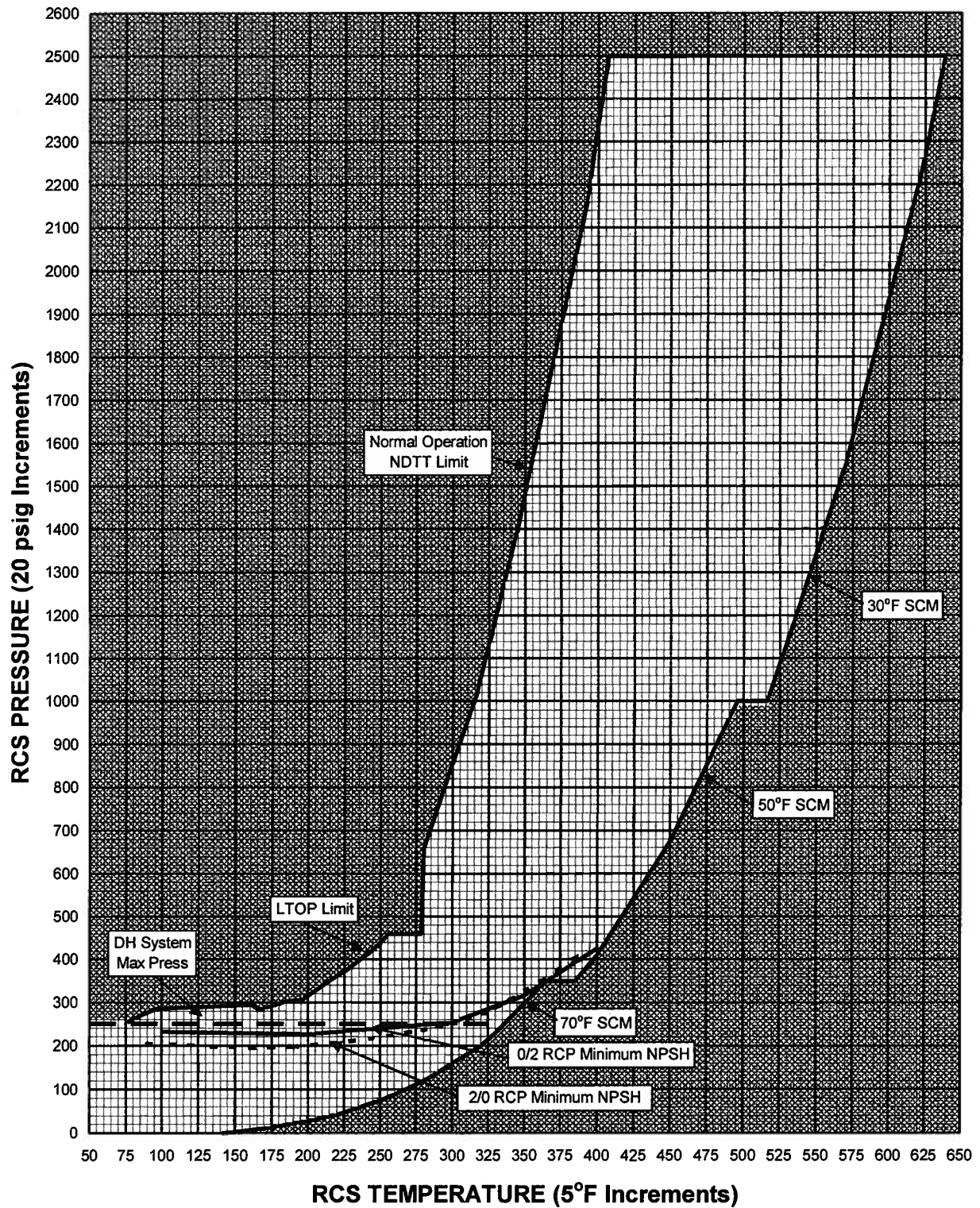
14.1.1 IF placing P-14A into service with P-14B running,
THEN perform the following:

- A. Dispatch operator to EH oil pumps to monitor for proper operation.
- B. Start P-14A by placing HS-9201 in START.
- C. WHEN operator reports that PI-8534 indicates P-14A discharge pressure ~ equal to P-14B,
THEN stop P-14B by placing HS-9202 in normal-after-stop.
- D. Contact operator stationed at the EH pumps for pump start to perform Unit 1 Ops Logs Posting AA EH Oil Inspection to verify P-14A operating properly.

14.1.2 IF placing P-14B into service with P-14A running,
THEN perform the following:

- A. Dispatch operator to EH oil pumps to monitor for proper operation.
- B. Start P-14B by placing HS-9202 in START.
- C. WHEN operator reports that PI-8546 indicates P-14B discharge pressure ~ equal to P-14A,
THEN stop P-14A by placing HS-9201 in normal-after-stop.
- D. Contact operator stationed at the EH pumps for pump start to perform Unit 1 Ops Logs Posting AA EH Oil Inspection to verify P-14B operating properly.

FIGURE 3
RCS Pressure vs Temperature Limits



Facility: ANO-1

Date of Exam: 3/8/2010

Operating Test No.: 2010-1

A P P L I C A N T	E V E N T T Y P E	Scenarios													
		1			2			3			T O T A L	M I N I M U M(*)			
		CREW POSITION			CREW POSITION			CREW POSITION							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P					
RO R2, R5, R8	RX					3						1	1	1	0
	NOR			1, 2		9						3	1	1	1
	I/C			4, 6		5, 6, 7, 8						6	4	4	2
	MAJ			8, 9		7						3	2	2	1
	TS											0	0	2	2
RO R6	RX								3			1	1	1	0
	NOR			1, 2			1		4			4	1	1	1
	I/C			4, 6		2, 4, 5, 6		2, 8, 9				9	4	4	2
	MAJ			8, 9		7		5, 6				5	2	2	1
	TS											0	0	2	2
RO R1, R7	RX		2									1	1	1	0
	NOR										1	1	1	1	1
	I/C		3, 6, 7								7	4	4	4	2
	MAJ		8, 9							5, 6		4	2	2	1
	TS											0	0	2	2
RO R3, R9	RX								3			1	1	1	0
	NOR						1		4			2	1	1	1
	I/C						2, 4, 5, 6		2, 8, 9			7	4	4	2
	MAJ						7		5, 6			3	2	2	1
	TS											0	0	2	2
RO R4	RX		2									1	1	1	0
	NOR						1				1	2	1	1	1
	I/C		3, 6, 7				2, 4, 5, 6				7	8	4	4	2
	MAJ		8, 9				7			5, 6		5	2	2	1
	TS											0	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility: ANO-1			Date of Exam: 3/8/2010			Operating Test No.: 2010-1										
A P P L I C A N T	E V E N T T Y P E	Scenarios											T O T A L	M I N I M U M(*)		
		1			2			3								
		CREW POSITION			CREW POSITION			CREW POSITION								
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P						
													R	I	U	
SRO-I I1	RX							3				1	1	1	0	
	NOR	1, 2			1, 3, 9			4				6	1	1	1	
	I/C	3, 4, 5, 6, 7			2, 4, 5, 6, 8			2, 8, 9				13	4	4	2	
	MAJ	8, 9			7			5, 6				5	2	2	1	
	TS	3, 7			5, 7							4	0	2	2	
SRO-I I2	RX					3						1	1	1	0	
	NOR	1, 2				9		1, 4, 8				6	1	1	1	
	I/C	3, 4, 5, 6, 7				5, 6, 7, 8		2, 7, 9				12	4	4	2	
	MAJ	8, 9				7		5, 6				5	2	2	1	
	TS	3, 7						1b, 6, 9				5	0	2	2	
SRO-U I3	RX		2									1	1	1	0	
	NOR				1, 3, 9							3	1	1	1	
	I/C		3, 6, 7		2, 4, 5, 6, 8							8	4	4	2	
	MAJ		8, 9		7							3	2	2	1	
	TS				5, 7							2	0	2	2	
SRO-U U1, U2	RX											0	1	1	0	
	NOR	1, 2			1, 3, 9			1, 4, 8				8	1	1	1	
	I/C	3, 4, 5, 6, 7			2, 4, 5, 6, 8			2, 7, 9				13	4	4	2	
	MAJ	8, 9			7			5, 6				5	2	2	1	
	TS	3, 7			5, 7			1b, 6, 9				7	0	2	2	

Instructions:

- Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
- Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
- Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility:	ANO-1				Date of Examination:	3/8/2010				Operating Test No.:	2010-1			
Competencies	APPLICANTS													
	RO				SRO-I				SRO-U					
	SCENARIO				SCENARIO				SCENARIO					
	1	2	3	4	1	2	3	4	1	2	3	4		
Interpret/Diagnose Events and Conditions	3, 4, 5, 6, 7, 9	2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	2, 3, 4, 5, 6, 7, 9	3, 4, 5, 6, 7, 9	2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	2, 3, 4, 5, 6, 7, 9	3, 4, 5, 6, 7, 9	2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	2, 3, 4, 5, 6, 7, 8, 9		
Comply With and Use Procedures (1)	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9		
Operate Control Boards (2)	1, 2, 3, 4, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Communicate and Interact	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9		
Demonstrate Supervisory Ability (3)	N/A	N/A	N/A	N/A	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9		
Comply With and Use Tech. Specs. (3)	N/A	N/A	N/A	N/A	3, 7	5, 7	1b, 6, 9	6, 7	3, 7	5, 7	1b, 6, 9	6, 7		
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.														

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.