Facility: ANO-1 Date of Examination: 9-12-05

Examination Level (circle one): (RO) / SRO Operating Test Number: 1

Administrative Topic (see note)	Type Code*	Describe activity to be performed
Conduct of Operations 2.1.19 (Imp 3.0)	M/S	Ability to use plant computer to obtain and evaluate parametric information on system or component status. A1JPM-RO-PMS1 Rev. 2
Conduct of Operations 2.1.23 (Imp 3.9)	D/S	Ability to perform specific and integrated plant procedures during all modes of operation. A1JPM-RO-RBAL3 Rev. 1
Equipment Control 2.2.26 (Imp 2.5)	N/S	Knowledge of refueling administration requirements. A1JPM-RO-REFUL1 Rev. 0
Radiation Control 2.3.11 (Imp 2.7)	D/P/S	Ability to control radiation releases. A1JPM-RO-RAD1 Rev. 2
Emergency Plan		

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
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs)
(N)ew or (M)odified from bank (≥ 1
(P)revious (≥ 1; randomly selected)
(S)imulator

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-RO-PMS1

UNIT: 1 REV # 2 DATE: _____

TUOI NUMBER: A1JPM-RO-PMS1

SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – CONDUCT OF OPERATIONS

TASK: OPERATE THE PLANT COMPUTER

JTA#: ANO1-RO-PMS-NORM-4

KA VALUE RO: 3.0 SRO: 3.0 KA REFERENCE: 2.1.19

APPROVED FOR ADMINISTRATION TO: RO: X SRO: _____

TASK 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: X

APPROXIMATE COMPLETION TIME IN MINUTES: 10 MINUTES

REFERENCE(S): 1105.010, 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: _____

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: The plant is at 100% power operations. The Makeup Tank level is at 60 inches. RCS boron concentration is 1000 ppm. BAAT boron concentration is 12,000 ppm.

TASK STANDARD: The examinee uses the plant computer "BORON" program to calculate a total addition to the Makeup Tank of approximately 600 to 630 gallons consisting of 50 to 52.5 gallons boric acid and 550 to 577.5 gallons of DI water.

TASK PERFORMANCE AIDS: 1105.010, Plant Monitoring System

NOTE: 1105.010 provides instructions for the Plant Monitoring System but the exact manipulations of this task are within the "skill of the craft." Therefore, procedure in hand is not required.

INITIATING CUE:

The CRS directs you to use the plant computer to calculate a "No Concentration Change" to raise the Makeup Tank level to ~80 inches.

CRITICAL ELEMENTS (C) 2, 3, 4, 5

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Select NASP on PMS screen or keyboard.	Selected NASP on PMS.	_____	_____	_____
(C)	2. Select BORON program.	Selected BORON program on PMS.	_____	_____	_____
(C)	3. Select option No. 5, No Concentration Change.	Typed "5" and pressed ENTER key on PMS keyboard.	_____	_____	_____
(C)	4. Select option 0, boric acid and DI water addition.	Typed "0" and pressed ENTER key on PMS keyboard.	_____	_____	_____
(C)	5. Enter values requested by BORON program.	Examinee entered the following values: • Makeup volume required (gallons) = 600 to 630 (trainee should calculate the value needed using 20 inches x 30.86 gallons/in.) • Makeup boron concentration required (ppm) = 1000 • Available feed solution Boron concentration (ppm) = 12,000 The PMS displayed the following values after entry of final value: • Feed volume DI H2O – 550 to 577.5 gallons • Feed volume boric acid – 50 to 52.5 gallons	_____	_____	_____

END

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- The plant is at 100% power operations.
- The Makeup Tank level is at 60 inches.
- RCS boron concentration = 1000 ppm
- BAAT boron concentration = 12,000 ppm

INITIATING CUE:

The CRS directs you to use the plant computer to calculate a "No Concentration Change" to raise the Makeup Tank level to ~80 inches.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-RO-RBAL3

UNIT: 1 REV # 1 DATE: _____

TUOI NUMBER: A1JPM-RO-RBAL3

SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – CONDUCT OF OPERATIONS

TASK: ESTIMATE BORON CONCENTRATION REQUIRED TO MAINTAIN SHUTDOWN MARGIN DURING HEATUP USING RHOBAL PROGRAM

JTA#: ANO1-RO-OPROC-NORM-70

KA VALUE RO: 3.9 SRO: 4.0 KA REFERENCE: 2.1.23

APPROVED FOR ADMINISTRATION TO: RO: x SRO: X

TASK 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: _____ PLANT SITE: _____ LAB: _____

TESTING METHOD: SIMULATE: _____ PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 MINUTES

REFERENCE(S): N/A

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: The plant is preparing for startup after a reactor trip. The plant had operated continuously at 100% power since the refueling outage EFPD = 0. RCS Tave = 185°F. Desired final RCS Tave = 532° Heatup is scheduled to commence later today.

TASK STANDARD: The examinee has calculated the required Boron concentration to maintain shutdown margin during heatup using RHOBAL and determined the value to be 1574 to 1600 ppm.

TASK PERFORMANCE AIDS: Personal computer with RHOBAL program available.

INITIATING CUE:

The Control Room Supervisor directs you to calculate Boron concentration required to maintain shutdown margin during heatup using the RHOBAL program.

CRITICAL ELEMENTS (C) 1, 2, 5

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
NOTE: Examinee may start in the "Poison" menu or in the "Shutdown Margin" menu. Either way, the examinee must establish a power history.					
(C)	1. Activate "Shutdown Margin" on pull down menu.	Clicked (or Alt S via keyboard) on Shutdown Margin" in menu bar.			
(C)	2. Run program to determine Boron concentration required to maintain shutdown margin.	Performed the following actions: • Clicked on Worksheet 5, "Boron Concentration Required to Maintain SDM during Cooldown or Heatup". • Entered 0 for "Cycle Burnup in EFPD". • Entered 0 for all CRA positions, except 30.4 for APSRs. • Entered 185 for "RCS Average Temperature in degrees F". • Entered 532 for "Final Desired RCS Average Temperature in degrees F".			
NOTE: Step 3 may be performed prior to step 1 via the "Poison" menu.					
	3. Activate "Xenon and Samarium" menu.	Clicked (or Alt P via keyboard) on "Xenon and Samarium" in menu bar.			
	4. Enter power history.	Performed the following actions: • Entered 0% "Power Level" • Entered today's date. • Entered 0 for "Burnup" • Clicked on "Beginning of cycle concentrations". • Clicked on "INITIALIZE POISONS" button. • Close "Xenon and Samarium" menu.			

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
(C)	5. Determine required Boron concentration.	Noted the "required Boron conc from Table or Figure B6" to be 1574. Candidate may discuss different boron concentration requirements for the various temperature ranges during heatup. *Accept 1574 to 1600 for final minimum boron concentration at 532*°F.			

END

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- The plant is preparing for startup after a refueling outage.
- The plant had operated continuously at 100% power prior to the refueling outage.
- EFPD = 0
- RCS Tave = 185°F
- Final RCS Tave = 532°F
- Heatup is scheduled to commence later today.

INITIATING CUE:

The SM/CRS directs you to calculate Boron concentration required to maintain shutdown margin during heatup to 532°F using the RHOBAL program.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-RO-REFUL1

UNIT: 1 REV # 0 DATE: _____

TUOI NUMBER: A1JPM-RO-REFUL1

SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – EQUIPMENT CONTROL

TASK: Perform Attachment B of 1502.004, Refueling Boron, Temperature, Tritium, and Level Check

JTA#: ANO1-RO-FUELH-NORM-25

KA VALUE RO: 2.5 SRO: 3.7 KA REFERENCE: 2.2.26

APPROVED 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: PERFORM LAB:_____

POSITION EVALUATED: RO:_____ SRO:_____

ACTUAL TESTING ENVIRONMENT: SIMULATOR:_____ PLANT SITE:_____ LAB:_____

TESTING METHOD: SIMULATE:_____ PERFORM:_____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 MINUTES

REFERENCE(S): 1502.004, Chg. 034-02-0

_____

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: _____

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: A refueling outage is in progress. Fuel handling is in progress.

TASK STANDARD: The examinee has correctly identified that VEF-15 should be running and stated the requirements of note 3 of Att. B.

TASK PERFORMANCE AIDS: 1502.004 Att. B

INITIATING CUE:

The CRS asks you about the status of Att. B of 1502.004, Control of Unit 1 Refueling. A license candidate has just completed Att. B and gives it to you for review. Determine if refueling requirements have been met and what actions need to be taken if they have not been met.

CRITICAL ELEMENTS (C) 2

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Review the completed Att. B of 1502.004.	Examinee reviewed the attachment.			
(C)	2. Identify errors.	Examinee identified the following: 1. VEF-15 FAN ON box not checked. 2. N/A entered under RECORD FLOWRATE for VEF-15. 3. IAW Note 3 TRM 3.6.1Condition A should be entered. 4. IAW Note 3 fuel movement should cease OR the remaining steps in this standard should be taken: • RB purge should be isolated. • a tritium sample of refueling canal water obtained. • Shifty tritium sampling of RB atmosphere commenced.			

END

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- A refueling outage is in progress.
- Fuel handling is in progress.

INITIATING CUE:

The CRS asks you about the status of Att. B of 1502.004, Control of Unit 1 Refueling. A license candidate has just completed Att. B and gives it to you for review. Determine if refueling requirements have been met and what actions need to be taken if they have not been met.

ATTACHMENT B

REFUELING BORON, TEMPERATURE, TRITIUM, AND LEVEL CHECK

DATE 9/12/05

PARAMETER	RCS TEMP (7) T1404	LAKE TEMP (8) T3646	SFP LEVEL LI-2004 (9)	TRANSFER CANAL LEVEL (9)	VEF-14A/B (1) ✓ FAN ON	VEF-14A/B (1) RECORD FLOWRATE (2)	VEF-15 (1) ✓ FAN ON	VEF-15 (1) RECORD FLOWRATE (2)	SW PRESS RECORD PRESSURE (12)	DAILY BORON SAMPLE Enter Sample Results and Sampling Time
MAX	140°F	85°F	0 FT	400.5 FT		4.29E4 CFM				
MIN	73°F		-0.5 FT	400 FT		3.51E4 CFM			1104.028 ATT. B	
TECH SPEC/ TRM/ SAR LIMIT		MAX 85°F	-1.0 FT MIN (10)	399.5 FT MIN (10) SR 3.9.6.1	Ventilation in operation (4)		(3) (11)		TRM FIGURE 3.7.3-1	Refueling Boron Concentration (6)
0000	105	66	-.26	400.5'	✓	3.67 E4	✓	1.87 E4	N/A	SF Pool 2774 ppm
0400	106	66	-.17	400' 5¾"	✓	3.67 E4	✓	1.87 E4		time 1033
0800	103	66	-.38	400.5	✓	3.67 E4	✓	1.86 E4		RF Canal 2582 ppm
1200	103	65	-.3	400.5	✓	3.66 E4	✓	1.88 E4	N/A	time 0930
1600	104	66	-.41	400.25	✓	3.67 E4	N/A	N/A		DH Sys 2592 ppm
2000 (5)										time 0825

SHIFTLY RB ATMOSPHERE TRITIUM CHECK (3)
IF RB Purge in operation, THEN N/A.

SHIFT	TIME	SAMPLE POINT	RESULTS
DAYS	N/A	N/A	N/A
NIGHTS			

(Notes on next pages)

ATTACHMENT B

(1) Log date and time of system startup following last test in the Chronological Log. Log indicated RB Purge flow rate after system startup and each time that major flow changes occur such as opening equipment hatch, etc.
IF systems are secured, THEN log date and time in Chronological Log, and log date and time of subsequent startup.

(2) VEF-14 A/B flowrate from SPING 3. VEF-15 from SPING 1.

(3) During fuel handling, RB purge shall be operable, and should be in operation. IF RB purge is inoperable, THEN enter TRM 3.6.1 Condition A, and either cease fuel movement, or isolate the RB purge system, obtain a tritium sample of refueling canal water, and commence shiftly tritium sampling of RB atmosphere.

(4) The Fuel Handling Area Ventilation System (FHAVS) shall be operable and in operation during movement of irradiated fuel assemblies in the fuel handling area (TS 3.7.12). IF VEF-14A/B flow rate degrades to outside required band,
THEN enter TS 3.7.12 Condition A, stop irradiated fuel movement, and reset dampers per Initial Conditions of Control of Fuel and Control Rod Movement in U-1 Spent Fuel Area (1502.010).

(5) Log completion of requirements for this date in Attachment C.

(6) IF sampling indicates that the concentration is dropping unexpectedly,
OR is below the Refueling Boron Concentration, (from Reactivity Balance Calculation, 1103.015, Worksheet 5 or 6)
THEN secure all fuel movement, and initiate boration to greater than the Refueling Boron Concentration. Boration shall be from the BAAT to the suction of DH Pumps per 1104.006.

(7) Use available indication that is representative of RCS temperature. Prefer installed TI-1404 and TI-1405. Note instrument used in header.

(8) Use available indication that is representative of lake temperature from one of the following locations. Note instrument used in header.

- Unit 1 plant computer (T3640, T3642, T3644 or T3646). Ensure associated waterbox is in-service.
- Unit 2 plant computer (T1430, T1436 or T1442). Ensure associated SW pump is in-service.

ATTACHMENT B

(9) WHEN SF-45 closed, THEN obtain both SFP and Transfer Canal level.
WHEN SF-45 open, THEN obtain either SFP or Transfer Canal level and N/A the other (in this case either reading will satisfy SR 3.9.6.1).

(10) SAR minimum level is based upon maintaining 23 feet over irradiated fuel assemblies in the Spent Fuel Pool storage racks.

(11) Daily determine if purge flow rate has varied by greater than 1300 cfm. Compare logged values to values recorded in chronological log (ensure comparison is made between similar conditions, i.e. VEF-15 and VSF-2 in operation equipment hatch open would not be comparable to same conditions with equipment hatch closed. IF values vary greater than 1300 cfm from recorded values, THEN contact SYE to determine impact.

(12) IF Temporary Alteration 1104.028 Attachment B modifying Service Water Outlet of E-28C is in service, THEN SW pressure must be verified as meeting the requirements of the Temporary Alteration. This reading is required to verify limits of TRM Figure 3.7.3-1 are maintained. Reference 1104.028 Attachment B to determine which indicator (PP-3840/PI-3607/PI-3608) is required to be monitored. It may be required to valve in PP-3840 temporary pressure gauge to obtain this reading. Obtain independent verification of gauge isolation if PP-3840 was valved in.

Performed by Joe White

Reviewed by _____ Date _____ Time _____
SRO in Charge of Fuel Handling,
CRS, or SM

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-RO-RAD1

UNIT: _____1_____ REV # ____2_____ DATE: _____

TUOI NUMBER: A1JPM-RO-RAD1

SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC-RADIATION CONTROL

TASK: ABILITY TO CONTROL RADIATION RELEASES.

JTA#: ANO1-WCO-CZ-NORM-11

KA VALUE RO: 2.7 SRO: 3.2 KA REFERENCE: 2.3.11

APPROVED FOR ADMINISTRATION TO: RO: X SRO: _____

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

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: PERFORM LAB: _____

POSITION EVALUATED: RO: X SRO: N/A

ACTUAL TESTING ENVIRONMENT: SIMULATOR: X PLANT SITE: _____ LAB: _____

TESTING METHOD: SIMULATE: X PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 MINUTES

REFERENCE(S): 1104.020, Chg. 042-00-0, P-47B Pump Differential Pressure versus Flow Rate graph

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 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS: Plant is shutdown for a Refueling Outage. Circulating Water Pump P-3A in service. ALL other Circ Water Pumps are OOS for maintenance. Discharge flow to flume indicator (FI-4642) is INOPERABLE and OOS. T-16B TWMT release is in progress. Maximum allowable flow rate for the release from Preliminary Report is 90 gpm. WCO reports CV-4642, CZ Discharge to Flume Flow Control Valve, is throttled open. WCO reports that P-47B, Treated Waste Monitoring Pump, parameters after establishing flow through CV-4642: Suction Pressure = 10 psig, Discharge Pressure = 38 psig.

TASK STANDARD: Candidate estimates release flow rate between 75 to 85 gpm and is within the allowable flow rate specified in the Preliminary Report.

TASK PERFORMANCE AIDS: 1104.020, Att. “B2”, Offsite Dose Calculation Manual (ODCM) and P-47B Pump Differential Pressure versus Flow Rate graph.

INITIATING CUE:

The CRS directs you to perform step 4.15.1 of 1104.020 Att. "B2" Treated Waste Monitor Tank (TWMT) T-16B Liquid Release Permit and report if the release flow rate is within the allowable limit.

CRITICAL ELEMENTS (C): 3, 5

(c)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
Examiner Cue: Provide Candidate with copy of partially completed 1104.020, ATT "B2".					
	1. Candidate performs a review of ATT "B" TWMT Release Permit.	Performed review of T-16B Liquid Release Permit.	____	____	____
	2. Perform step 4.15.1.A FI-4642 inoperable actions.	Recognized actions for inoperable flow indicator contained in ODCM App. 1 Table 2.1-1.	____	____	____
C	3. Determine required actions for conducting release with FI-4642 inoperable.	Utilized procedure to ensure compliance with ODCM App. 1 Table 2.1-1 Action 2. Determined release flow rate required to be estimated at least once every four hours utilizing pump curves.	____	____	____
Note: Candidate should discuss options available to obtain pump curve data which may include any of the following: 1) Contacting System Engineer 2) Reference Pump Technical Manual. *Examiner Cue: Provide Candidate with copy of P-47B Pump Curve upon request.*					
	4. Obtain pump curve data to estimate release flow rate.	Candidate obtained pump curve data.	____	____	____
Note: Pump Suction and Discharge pressure are given in Initial Task Conditions.					
C	5. Determine pump flow rate based on pump differential pressure.	Candidate calculated pump differential pressure and estimates a flow rate of 70 to 80 gpm using pump curve.	____	____	____
	6. Report that flow is within allowable limit.	Candidate reported to CRS that flow is within allowable limit.	____	____	____

END

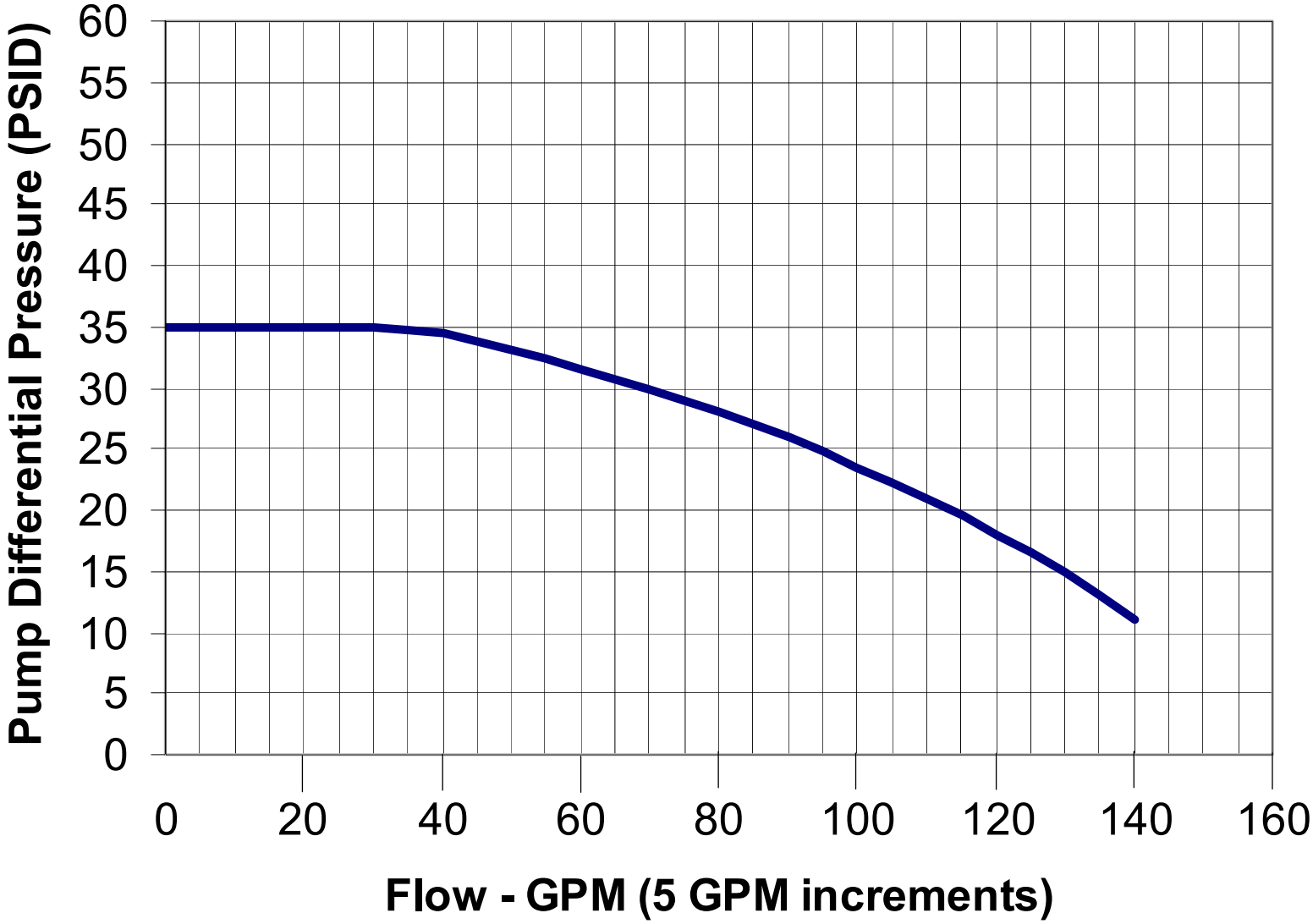
JPM INITIAL TASK CONDITIONS:

- Plant is shutdown for a Refueling Outage.
- Circulating Water Pump P-3A in service. ALL other Circ Water Pumps are OOS for maintenance.
- Discharge flow to flume indicator (FI-4642) is INOPERABLE and OOS.
- T-16B TWMT release is in progress.
- Maximum allowable flow rate for the release from Preliminary Report is 90 gpm.
- WCO reports CV-4642, CZ Discharge to Flume Flow Control Valve, is throttled open.
- WCO reports that P-47B, Treated Waste Monitoring Pump, parameters after establishing flow through CV-4642:
  - Suction Pressure = 10 psig
  - Discharge Pressure = 38 psig

INITIATING CUE:

The CRS directs you to perform step 4.15.1 of 1104.020 Att. “B2” Treated Waste Monitor Tank (TWMT) T-16B Liquid Release Permit and report if the release flow rate is within the allowable limit.

Treated Waste Monitor Pump P-47B



ATTACHMENT B2

TREATED WASTE MONITOR TANK (TWMT)
T-16B LIQUID RELEASE PERMIT

PERMIT # 1-LR-2005-0100 (Assigned by Chemistry) 09/12/2005 Date

INITIALS

1.0 REQUEST (Operations)

1.1 T-16B taken out of service and placed on recirc for sampling and release:

Date 09/12/2005 Time 0010 . SRP

NOTE

Tag contains information to remind personnel that tank is isolated for chemistry sample.

1.2 Verify Treated Waste Monitor T-16B Inlet (CZ-47B) is closed and tag is installed on handwheel or chain operator. SRP

1.3 Initial T-16B level 92 %. Record local or remote level indication. (Circle one) SRP

1.4 IF Liquid Radwaste Process Monitor (RI-4642) is available, THEN perform the following:

1.4.1 Verify RI-4642 operable by performing one of the following::

A IF monitor count rate is ≤ 1000 cpm, THEN perform the following:

1. Verify no Liquid Release in progress using FI-4642. N/A

2. Select "Check Source" on RI-4642 and verify that the monitor responds to check source with a count rate rise >100 cpm. N/A

B. IF monitor count rate >1000 cpm, THEN verify that count rate is <4.22E6 cpm. SRP

1.4.2 IF RI-4642 is operable, THEN record Rad Monitor RI-4642 background counts and continue. 1.0 E4 cpm SRP

1.4.3 IF RI-4642 is inoperable, THEN notify Chemistry and continue. N/A

ATTACHMENT B2

1.5 Record the following: SRP

1.5.1 # of CW Pumps running 1

and CW pump Disch Press 1.1 psig

1.6 IF adjustments are made to CW flow, THEN terminate release.

1.7 Submitted to Chemistry for Analysis, Section 2.0. SRP
Date 9/12/2005 Time 0120

Section 1.0 Performed By Steven R. Pullin

2.0 Analysis (Chemistry)

2.1 Tank T-16B sample obtained for release analysis. JB

Date/Time 09/12/05 / 0200

Performed by John Brown .

2.2 IF required for weekly sample for oil and grease, THEN Tank T-16B sample obtained. Otherwise N/A. N/A

Performed by N/A

2.3 T-16B pH analysis performed by John Brown JB

2.3.1 T-16B pH 7.0

2.4 IF pH is not between 6.0 and 9.0, THEN adjust per Sampling the Treated Waste Monitor Tanks (T-16A/B) (1607.009). Otherwise N/A. N/A

2.4.1 Tank T-16B post neutralization pH sample, N/A

Obtained by N/A

2.4.2 T-16B post neutralization pH sample, N/A

Analysis performed by N/A

2.4.3 T-16B post neutralization pH N/A

2.4.4 IF pH is not between 6.0 and 9.0, THEN re-perform adjustment and analysis sequence until pH is between 6.0 and 9.0. Otherwise N/A. N/A

2.5 Gamma spectroscopy performed by John Brown

2.6 Gamma spectroscopy report reviewed by Jim Smith

2.7 Tritium analysis performed by John Brown

2.8 IF Liquid Radwaste Process Monitor (RI-4642) is inoperable or unavailable as identified in "Request" or "Verification of Pre-Release Requirements" sections of this permit, THEN the following ODCM App. 1, Table 2.1-1 requirements shall be met. Otherwise N/A. N/A

2.8.1 An independent sample of the tank contents shall be obtained and analyzed.

Performed by N/A

2.8.2 Computer input data shall be independently verified correct.

Performed by N/A

2.9 Sample results indicate release of total tank contents will not violate ANO radioactive effluent discharge limit. JB

2.10 Preliminary release report prepared by John Brown
IF not radioactive THEN N/A.

2.11 Preliminary release report and/or permit returned to Control Room.
By John Brown Date 09/12/05 Time 0700

3.0 Verification of Pre-Release Requirements (Operations)

3.1 Verify CW flow/configuration recorded in initial release submittal data is still valid. SRP

3.2 Verify appropriate signatures on preliminary report. SRP

3.3 CRS/SM approval to proceed with release.

CRS/SM Abel Leader

3.4 Provide copy of Setpoints section from Preliminary Report to Control Room Operators. SRP

3.5 Verify F560 in service by performing the following:

3.5.1 Verify open:

- CZ-74 (LRW Disch Filter F-560 Inlet) SRP
- CZ-77 (LRW Disch Filter F-560 Outlet) SRP

3.5.2 Verify closed CZ-83 (LRW Disch Filter F-560 Bypass) SRP

3.6 IF Liquid Radwaste Process Monitor (RI-4642) is operable and available,
THEN verify proper operation of radiation monitor and interlocks as follows. Otherwise N/A.

3.6.1 Check Liquid Radwaste Process Monitor (RI-4642) available by one of the following methods: SRP

- IF monitor count rate is ≤ 1000 cpm, THEN select CHECK SOURCE on RI-4642 and verify that the monitor responds to check source with a count rate rise >100 cpm.
- IF monitor count rate >1000 cpm, THEN verify that count rate is <4.22E6.

3.6.2 Verify the following valves closed:

- FWMT Disch to CW Flumes (DZ-25) SRP
- LZ Drain Pump P-45 Discharge to Flume (LZ-5) SRP
- Treated Waste Discharge to Circ Water Flume (CZ-58) SRP

3.6.3 Place CZ Disch to Flume Flow Control Valve (CV-4642) hand switch to OPEN. SRP

A. Verify FIC-4642 in Manual and fully open CV-4642 using the Manual Adjustment Knob. SRP

3.6.4 Lower RI-4642 alarm setpoint until HIGH RAD alarm actuates. SRP

3.6.5 Verify from CV-4642 indicating lights that CV-4642 trips closed. SRP

3.6.6 Place CV-4642 HS to CLOSED position. SRP

A. Turn Man. Adj. Knob to fully Closed Position (fully counterclockwise). SRP

3.6.7 Adjust RI-4642 setpoint to the value listed in the Preliminary Report for total Circ Water flow. SRP

3.6.8 Verify a Licensed Operator, other than individual who initially set RI-4642 setpoint, has independently verified that RI-4642 setpoint is correct for total circ water flow. SRP

3.6.9 Reset RI-4642 HIGH RAD alarm. SRP

3.7 IF RI-4642 is inoperable or unavailable,
THEN verify requirements specified in "Analysis" section of this permit for RI-4642 inoperable or unavailable have been performed. Otherwise N/A. N/A

Section 3.0 Performed By Steve Pullim

4.0 Release (Operations)

CAUTION

Unauthorized discharge to Lake Dardanelle via the flume shall be avoided.

4.1 Verify CZ Disch to Flume Flow (CV-4642) closed. SRP

4.2 Verify T-16B X-FER PP (P-47B) stopped. SRP

NOTE

Tag contains information to remind personnel that tank is isolated for chemistry sample.

4.3 Verify Treated Waste Monitor Tank T-16B Inlet (CZ-47B) closed and tagged. SRP

4.3.1 IF tag is missing or has been removed since tank was last sampled,
THEN perform the following. Otherwise N/A.

A. Terminate this release. N/A

B. Install tag on CZ-47B. N/A

C. Submit new release permit to Chemistry. N/A

4.4 Verify Treated Waste Monitor Tank T-16B Outlet (CZ-48B) open. SRP

4.5 Verify Treated Waste Discharge Valve to Header from P-47A (CZ-55A) closed. SRP

4.6 Verify Treated Waste Monitor Tank T-16B Recirc Inlet (CZ-54B) closed. SRP

4.7 Open Treated Waste Discharge Valve to Header from P-47B (CZ-55B). SRP

4.8 Open Treated Waste Discharge to Circ. Water Flume (CZ-58). SRP

4.9 Verify Treated Waste Monitor Pump Discharge to Clean Waste Tanks (CZ-57) closed. SRP

4.10 Verify Unit 1/Unit 2 Liquid Radwaste Manifold Isol (CZ-87) closed. SRP

4.11 Verify Suction Crossover on Treated Waste Monitor Pumps (CZ-50) closed. SRP

4.12 IF Liquid Radwaste Process Monitor (RI-4642) is inoperable or unavailable,
THEN perform the following. Otherwise N/A
(ODCM App.1, L2.1.1).

4.12.1 Verify FWMT Disch to CW Flumes (DZ-25) closed. N/A

4.12.2 Verify LZ Drain Pump P-45 Discharge to Flume (LZ-5) closed. N/A

4.12.3 Person qualified as Waste Control Operator, independently verify release path valve alignment prior to release (ODCM App.1, Table 2.1-1). N/A

4.13 Notify control room of intent to begin release. SRP

4.14 Commence T-16B release as follows:

4.14.1 Start P-47B. SRP

4.14.2 Place CZ Disch to Flume Flow (CV-4642) hand switch to OPEN. SRP

CAUTION

Use of flow rate greater than allowable by the release permit may violate ODCM limits for release and may be NRC reportable.

NOTE

Allowable Release Flow Rate is Listed in the "Max Waste (GPM)" Column of the Preliminary Report.

4.14.3 Use CZ Disch to Flume (FIC-4642) to obtain flow rate ≤ allowable release flow rate for total circ water flow. N/A (1) SRP
Max Flow Rate from Preliminary Report (90 gpm)

1. **Note: FIC 4642 inoperable, cannot determine flow rate, procedure is deviated, release can continue as long as flow is estimated every 4 hours.**

ATTACHMENT B2

4.15 WHEN release has started,
THEN perform the following:

4.15.1 Control Room Personnel shall observe Discharge Flow to Flume (FI-4642). Verify release flow rate is ≤ allowable release flow rate for total circ water flow. _____

A. IF FI-4642 is inoperable, THEN estimate flow rate at least once every four hours during release (ODCM App.1, Table 2.1-1). Otherwise N/A. _____

NOTE

If a Plant Computer tabular Log (DUMP) is used instead of Process Radiation Monitoring Effluent Recorder (RR-4830), the tabular log shall contain at least points R4642, R3618 and be set at ≤ 5 minute intervals and cover the duration of the release.

4.15.2 Record the following data on RR-4830. _____
IF RR-4830 not available,
THEN verify Plant Computer tabular log is activated and record data on it.

A. Release start time _____ Date _____

B. Release permit number _____

C. Name and number of tank being released: "TWMT (T-16B)"

4.15.3 Notify RP that T-16B release has started and LRW disch filter F-560 should be periodically monitored for Rad levels. _____

4.15.4 Notify Chemistry that T-16B release has started. _____

CAUTION

Pumping radioactive liquid tanks empty can cause sediment in bottom of tank to be deposited in discharge piping. This can produce higher radiation areas in the vicinity of the discharge piping than previously existed.

4.16 Verify by tank level observation that only T-16B is being released. _____

NOTE

Liquid Radwaste Disch Filter (F-560) inlet press should not exceed 25 psig.

4.16.1 Monitor F-560 during release for a rise in inlet pressure. ⬅

4.16.2 IF LRW Disch Filter (F-560) inlet press on PI-4606 exceeds 25 psig, THEN perform the following:

A. Stop P-47B. _____

B. Place CZ Disch to Flume Flow (CV-4642) handswitch to Close. _____

C. Perform "Backflushing the Liquid Radwaste Discharge Filter (F-560)" section of this procedure. _____

D. WHEN backflush is complete, THEN recommence release at step 4.14 of this Attachment. _____

4.17 WHEN release is complete, THEN perform the following.

4.17.1 Verify P-47B is off and hand switch is "Green Flagged". _____

4.17.2 Verify discharge flow ~zero gpm. _____

4.17.3 Notify RP that T-16B release is complete and that F-560 should be surveyed for Rad levels to determine the need to back flush F-560. _____

4.17.4 Back flush F-560 as necessary per RP survey. ⬅

4.18 Notify control room that release is complete. _____

ATTACHMENT B2

4.19 Record the following data on RR-4830. _____
IF RR-4830 was not available,
THEN record on Plant Computer tabular logsheets.

A. Release stop time _____ Date _____

B. Release permit number _____

4.20 Flush clean waste to discharge flume piping as follows:

4.20.1 Close Treated Waste Discharge Valve to Header from P-47B (CZ-55B) _____

4.20.2 Close CZ-58. _____

4.20.3 Align demineralized water to discharge piping by opening Condensate Flush Disch Hdr (CS-256). _____

4.20.4 After flushing piping for ~ 5 minutes, Close CS-256. _____

4.21 Place CV-4642 hand switch to CLOSE and verify indicating lights show valve closed. _____

4.21.1 Verify FIC-4642 in manual and turn Man. Adj. Knob to CLOSED position (fully counterclockwise) _____

4.22 Record final T-16B level _____% _____

4.23 Remove tag from Treated Waste Monitor T-16B Inlet (CZ-47B). _____

4.24 Return release permit with all attachments to CRS/SM. _____

Performed by _____ Date _____

Approved by CRS/SM _____ Date _____

4.25 Return the following to Chemistry:

- This attachment
- Release permit
- Tabular logsheets, if used.

Facility: ANO-1 Date of Examination: 9-12-05

Examination Level (circle one): RO / (SRO) Operating Test Number: 1

Administrative Topic (see note)	Type Code*	Describe activity to be performed
Conduct of Operations 2.1.12 (Imp 4.0)	N/S	Ability to apply technical specifications for a system. New admin JPM A1JPM-SRO-TS1
Conduct of Operations 2.1.34 (Imp2.9)	N/S	Ability to maintain primary and secondary plant chemistry within allowable limits. New admin JPM A1JPM-SRO-CHEM1
Equipment Control 2.2.11 (Imp 3.4)	N/S	Knowledge of the process for controlling temporary changes. New admin JPM A1JPM-SRO-TALT2
Radiation Control 2.3.10 (Imp 3.3)	M/S	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. Modified A1JPM-SRO-RC22
Emergency Plan 2.4.29 (Imp 4.0)	N/S	Knowledge of the emergency plan. New admin JPM A1JPM-SRO-EAL9.

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
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs)
(N)ew or (M)odified from bank (≥ 1
(P)revious (≥ 1; randomly selected)
(S)imulator

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-SRO-TS1

UNIT: 1 REV # 0 DATE: _____

TUOI NUMBER: A1JPM-SRO-TS1

SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – CONDUCT OF OPERATIONS

TASK: Apply technical specifications for a system.

JTA#: ANO-SRO-ADMIN-NORM-22

KA VALUE RO: 2.9 SRO: 4.0 KA REFERENCE: 2.1.12

APPROVED FOR ADMINISTRATION TO: RO: _____ SRO: X

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

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: PERFORM LAB: _____

POSITION EVALUATED: RO: N/A SRO: X

ACTUAL TESTING ENVIRONMENT: SIMULATOR: X PLANT SITE: _____ LAB: _____

TESTING METHOD: SIMULATE: _____ PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 30 MINUTES

REFERENCE(S): Unit One Technical Specifications; 1104.036

_____

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: The plant had been operating at 100% for 100 days. DH pump P-34A is tagged out to replace a leaking seal. The monthly surveillance for DG2 has begun to ensure it is completed within the requirements of the surveillance schedule.

TASK STANDARD: Examinee correctly recognizes that Tech Spec LCO SR 3.8.1.1 , 3.8.1 condition B is applicable, LCO 3.8.1 condition B.2 declare the DH pump P-34B inoperable due to inoperable emergency power supply, LCO 3.5.2 condition C applicable due to both DH pumps inoperable. 3.5.2 condition C is also applicable, and LCO 3.0.3 must be entered.

TASK PERFORMANCE AIDS: 1104.036; Technical Specifications

INITIATING CUE:

The CBOT has just performed, Supplement 2, DG2 Monthly Test, of 1104.036 through step 2.9.4, he discontinued the test per step 2.9.5, and has given you, the CRS, the supplement for review.

CRITICAL ELEMENTS (C) 4

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Review supplement.	Reviewed supplement.	____	____	____
	2. Perform step 3.2.	Performed the following: • Immediately notified Shift Manager. • Declared DG2 inoperable. • Verified a Condition Report initiated. • Initiated corrective action.	____	____	____
	3. Per step 3.2, reference Tech Specs.	Referenced Tech Specs.	____	____	____
(C)	4. Determine applicable Tech Specs and required actions.	Determined the following: • SR 3.8.1.1 • LCO 3.8.1 condition B applicable due to inoperable DG2. • LCO 3.8.1 condition B.2, declare the DH pump P-34B inoperable due to inoperable emergency power supply. • LCO 3.5.2 condition C applicable due to both DH pumps inoperable. • LCO 3.0.3 would be entered.	____	____	____

END

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- The plant had been operating at 100% for 100 days.
- DH pump P-34A is tagged out to replace a leaking seal.
- The monthly surveillance for DG2 has begun to ensure it is completed within the requirements of the surveillance schedule.

INITIATING CUE:

The CBOT has just performed, Supplement 2, DG2 Monthly Test, of 1104.036 through step 2.9.4, he discontinued the test per step 2.9.5, and has given you, the CRS, the supplement for review.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **EMERGENCY DIESEL GENERATOR OPERATION** SET #	DOCUMENT NO. **1104.036**	CHANGE NO. **042-03-0**
	WORK PLAN EXP. DATE **N/A**	TC EXP. DATE **N/A**
	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	Effective Communication
Distraction/Interruption	Questioning Attitude
Multiple Tasks	Placekeeping
Over Confidence	Self Check
Vague or Interpretive Guidance	Peer Check
First Shift/Last Shift	Knowledge
Peer Pressure	Procedures
Change/Off Normal	Job Briefing
Physical Environment	Coaching
Mental Stress (Home or Work)	Turnover

VERIFIED BY	DATE	TIME
Farrell	9-12-05	0730

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	1000.006A	050-00-0

SUPPLEMENT 2

DG2 MONTHLY TEST

This test demonstrates operability of DG2 and the AC, DC, and shaft-driven lube oil system; air start system; fuel oil transfer system; engine cooling system and ventilation system and satisfies SR 3.8.1.2, SR 3.8.1.3, SR 3.8.1.4, SR 3.8.1.6, SR 3.8.3.3, TR 3.8.3.1, and TS 5.5.8 (ANO IST program requirements). Reg Guide 1.97 Instrumentation channel checks of DG instrumentation are performed in this Supplement. Instructions are provided for pre- and post-operation checks. Data is recorded to assist in tracking performance trends of the diesel and generator.

NOTE

- Inoperable safety-feature valves may be locked in their actuated position to maintain overall operability.
- DG start location alternates with each performance of a regularly scheduled test.

1.0 INITIAL CONDITIONS — INITIALS

1.1 Check the purpose of this test:
- ✓ A. Regularly scheduled monthly test (local, remote start) circle one
- __ B. Regularly scheduled quarterly test (includes P-16B/DG vibration data). (local, remote start) circle one
- __ C. Operability test following significant maintenance (describe maintenance performed in section 4.0).
- __ D. Two hour loaded run following a series of Supplement 12 Operability tests.
- __ E. Other (describe in section 4.0).

1.2 Service water loop II in service. SN

1.3 IF this test is returning DG2 to operable condition, THEN verify DG2 aligned for emergency standby per Attachment D. N/A

1.4 A stopwatch shall be used to clock DG to verify unit is available to carry load within 15 seconds.

M&TE No. DES 078 Cal Due Date 12-6-05

1.4.1 Record stopwatch M&TE number in section 3.0. SN

1.5 Contact Dispatcher with the following information exchange: JAP

- Notify Dispatcher that DG surveillance will be conducted.
- Verify no off-site grid disturbance is expected, such as a severe electrical storm in the area.
- Request dispatcher notify ANO Unit 1 if any disturbances develop.

1.6 IF this is a regularly scheduled monthly or quarterly test, THEN notify Chemistry to prepare to sample fuel oil, lube oil, and cooling water. JAP

1.7 Obtain cylinder drain cock tool, engine jacking mechanism, and hearing protection. JAP

1.8 Review the following limits and precautions: JAP

- Diesel run time unloaded or at low load (<75%) should be minimized in order to prevent carbon fouling (improper combustion) and excessive turbocharger gear train wear.
- Do not attempt diesel generator restarts until engine has stopped (0 RPM).
- Governor booster pump tubing should be inspected for leaks during diesel run to prevent loss of governor control oil pressure.
- During periods of known off-site electrical grid disturbances, neither diesel should be paralleled with the grid.
- Do not tie both EDGs to the grid simultaneously when both EDGs are in operation. One DG shall be dedicated only to its ES bus. Otherwise a single grid electrical fault may cause a loss of both emergency diesel generators.
- A delay in opening output breaker at 100 KW when unloading a diesel may result in a motoring trip.
- A delay in loading a diesel after closing the output breaker may result in a motoring trip.
- Actions such as resetting, changing control switch positions, reconfiguring components, or attempting diesel restart after failure can cause loss of data useful in diagnosing problems and should be avoided if not an emergency.

- Adjusting either Unit 1 or Unit 2 Main Generator reactive loading may result in significant changes in EDG reactive loading while the diesel generator is paralleled to the grid.

- Maximum ambient temp for diesel operation is 122°F. Verify ventilation fans operate to maintain ambient temp < maximum allowed.

- Maximum engine outlet water temperature is 205°F.

- Minimum oil pressure is 26 psig when diesel is operating at 900 RPM.

1.9 Verify SERV WTR to DG2 CLRS (CV-3807) is closed. JAS

1.10 Portable vibrometer available. JNI

2.0 TEST METHOD

2.1 IF during the performance of this supplement it is desired to monitor DG2 crankcase pressure, THEN perform the following: ←

2.1.1 Open K-4B Crankcase Pressure PI-5244B Isolation (FO-5244B).

2.1.2 Monitor PI-5244B.

2.1.3 Close FO-5244B.

2.2 IF during the performance of this supplement it is desired to monitor DG2 air box pressure, THEN perform the following: ←

2.2.1 Open K-4B Air Box Pressure PI-5245B Isolation (FO-5245B).

2.2.2 Monitor PI-5245B.

2.2.3 Close FO-5245B.

2.3 Lubrication System Testing

2.3.1 Check engine lube oil level between $^1/_4$ and 1" above dipstick full mark with engine stopped. JAF

A. IF oil level is low, THEN submit WR/WO for oil addition. N/A

B. IF oil level is below LOW mark, THEN do not run diesel until oil is added. N/A

1) Stop the test AND notify the Shift Manager. N/A

2.3.2 Verify DG2 AC Lube Oil Soak Back Pump (P-106B3) running. JAF

A. Record lube oil pressure at DG2 Turbocharger BRG Oil PRESS (PI-5271) on DG2 engine control panel C108. JAF

26 psig

2.3.3 Turn DG2 AC Lube Oil Soak Back Pump (P-106B3) hand switch to OFF. JAF

A. Check DG2 DC Lube Oil Soak Back Pump (P-106B1) starts. JAF

B. Acknowledge SOAK BACK PP (P-106B3) OFF (K1613 on C567) annunciator. JAF

C. Record lube oil pressure to turbo bearings at PI-5271. JAF

32 psig

2.3.4 Place P-106B3 hand switch to ON. JAF

A. Check P-106B3 starts. JAF

B. Check P-106B1 stops. JAF

C. Record lube oil pressure to turbo bearings at PI-5271. JAF

26 psig

2.3.5 Verify DG2 AC Lube Oil Soak Back Pump (P-106B2) running. SM

NOTE

Pump discharge pressure must be >30 psig to circulate oil through 30# spring loaded check valve, DG2 AC Lube Oil Soak Back Pump P-106B2 Disch CK (FO-84B).

A. Record discharge pressure at DG2 AC Lube Oil Soak Back Pump P-106B2 DISCH PRESS (PI-5275) on C108. SM

42 psig

B. IF P-106B2 discharge pressure is <30 psig, THEN stop test and notify Shift Manager. NA

2.3.6 Clear Soak Back Pump alarms. SM

NOTE

Technical Specification SR 3.8.3.3 requires verifying each DG air start receiver pressure is ≥ 175 psig on a 31 day frequency. This surveillance requirement ensures that without the aid of the starting air compressor, sufficient air start capacity for DG is available. The required receiver consists of one bank of two tanks. The following step checks both banks, although only one bank is required.

2.4 Air Start Receiver Test

2.4.1 Verify the DG2 Starting Air Compressor Receiver pressure is > 175 psig per the following pressure indicators: (circle instruments used here and in Section 3.0) SM

- PI-5236 or (PI-5238)
  AND
- PI-5239 or (PI-5240)

A. Record the data in Section 3.0. SM

NOTE

- Governor oil level is intended to be maintained between the high and low marks when the EDG is in operation.
- Governor should operate normally with high oil level.
- Governor oil level will rise when the EDG is shutdown.

2.5 Control Oil Check

2.5.1 Check governor oil level sightglass ~ 1/2 full. SAT

A. IF low, THEN submit WR/WO for oil addition. N/A

B. IF empty, THEN do NOT run diesel until oil is added. N/A

1. Notify S/M. N/A

C. IF governor oil level is above the sightglass, THEN submit WR/WO for oil removal. N/A

2.6 Cooling Water Check

2.6.1 Check DG2 Cooling Water Expansion Tank (T-78B) water level within band for engine stopped. SAT

A. IF below lower limit, THEN add DI water until ~$^1/_2$ band is reached in the "Engine Stopped" band. N/A

2.7 Verify no compression cylinder inleakage as follows:

2.7.1 IF any of the following conditions exist, THEN N/A steps 2.7.2 through 2.7.11. Otherwise N/A this step and GO TO step 2.7.2. N/A

A. DG1 inoperable.

B. Any Tech Spec required odd train ES component inoperable

CAUTION

Placing engine control selector switch in MAINT will prevent diesel start, rendering DG2 inoperable.

NOTE

If DG2 becomes inoperable for >1 hour, then the following should be performed:

- B55/56 should be aligned to load center associated with operable diesel.
- OP and STBY HPI pumps should be aligned to the operable EDG.

2.7.2 Perform the following:

A. IF RCS above Mode 5, THEN enter TS 3.8.1 Condition B. SAP

Time 0930 Date 9-12-05

NOTE

Unit 2 requires both VSF-9 and 2VSF-9 to maintain auto-start capability in Modes 1-4, which also requires operability of both normal and emergency power supplies. Thus if VSF-9 is powered from ANO1 and B55/56 are aligned to an inoperable EDG, ANO2 must declare VSF-9 inoperable.

B. Notify Unit 2 that DG2 is inoperable. SAP

1. IF B55/B56 are aligned to B6, THEN inform Unit 2 that VSF-9 is inoperable for Unit 2. NA

C. IF DG2 inoperability will exceed 1 hour, THEN perform the following:

- Complete 1107.001, Sup 10, Verification of Two Offsite Circuit Power Sources ⟵
- If desired, align B55/56 to load center associated with operable EDG ⟵
- If desired, align OP and STBY HPI pumps to bus associated with operable EDG ⟵

2.7.3 Place Engine Control selector switch on C108 in MAINT. SM

A. Record time HS placed in MAINT. SM

0933

B. IF power is lost to bus A4 during performance of this section of the procedure,
THEN perform the following:

1. Verify MCC B55 and B56 powered from bus B5.

2. Remove engine jacking mechanism.

3. Close all cylinder drain cocks snugly using the cylinder drain cock tool.

4. Return Engine Control selector switch to REMOTE.

2.7.4 Open all cylinder drain cocks ~3 turns. SM

CAUTION

Water or oil exiting ports prior to engine rollover indicates gross water jacket or fuel system failure.

2.7.5 Observe cylinder drain cock ports for water or oil. SM

2.7.6 IF drainage is observed,
THEN perform the following:

A. Do NOT roll over diesel as engine damage WILL occur. N/A

B. Mark affected cylinder(s) on vibration reading data sheet diesel illustration.

1. Record type of liquid in section 4.0.

C. Discontinue this test AND notify Shift Manager that DG2 is inoperable.

2.7.7 Roll over diesel by installing engine jacking mechanism and manually jacking engine over at least one full turn. SAS

2.7.8 Remove engine jacking mechanism. SAS

2.7.9 Observe cylinder drain cock ports for water or oil. SAS

2.7.10 IF drainage is observed,
THEN perform the following:

A. Mark affected cylinder(s) on vibration reading data sheet diesel illustration. N/A

1. Record type of liquid in section 4.0.

B. Discontinue this test AND notify Shift Manager that DG2 is inoperable.

2.7.11 Close all cylinder drain cocks snugly using the cylinder drain cock tool. SAS

2.8 Verification of Local Start Capability

2.8.1 Record DG2 Engine Total HRS (C108): 442.4 hrs. SN

NOTE
If other than regularly scheduled test, start location is optional.

2.8.2 From "Initial Conditions" section of this supplement, note which starting station is to be used for this test, local or remote.

A. IF remote, THEN place Engine Control Selector switch on C108 in REMOTE. SN

B. IF local, THEN place Engine Control Selector switch on C108 in LOCAL. N/A

C. Record time HS removed from MAINT. SN

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NOTE
Placing Engine Control Selector switch in LOCAL restores autostart capability and operability.

D. IF applicable, THEN exit all TS Conditions entered for performance of this test. SN

Time 0942 Date 9-12-05

E. Notify Unit 2 that DG2 is operable. Otherwise N/A, if proving operability after maintenance. SN

2.8.3 IF LOCAL is selected, THEN continue with step 2.8.4. N/A

2.8.4 IF REMOTE is selected, THEN GO TO step 2.9 and N/A steps 2.8.5 through 2.8.15. SN

2.8.5 Station operators to observe starter motor(s) used for diesel start to determine which starter functioned AND verify presence of oil in starter exhaust. N/A

NOTE
Be prepared to clock elapsed time from start signal until voltage exceeds 3750 volts.

2.8.6 Perform local start of diesel as follows:

A. Start, or verify started, Diesel Generator Room Exhaust Fans AND verify dampers open on C19 or locally.

1. Verify VEF-24C running. N/A
2. Check Damper TV-7902A open. ____
3. Verify VEF-24D running. ____
4. Check Damper TV-7902B open. ____
5. Record verification in section 3.0 ____

B. Verify volts selector switch for DG2 AC Voltage meter (on E21) NOT in OFF. ____

C. Simultaneously depress START pushbutton on C108 AND start the stopwatch. ____

D. WHEN DG2 voltage exceeds 3750 volts, THEN stop the watch. ____

2.8.7 Record the following in section 3.0:

A. Time elapsed from operation of start switch until voltage exceeded 3750 volts. ____

B. Stroking of starter bank used: (Check one) ____

SV-5237, CV-5237 and FO-164(north bank) N/A ,
or
SV-5239, CV-5239 and FO-163(south bank) ↓ .

2.8.8 Record Time/Date of DG2 start. ____

Time/Date N / A

2.8.9 Check presence of oil in exhaust of starter used. N/A

A. IF no indication of oil, THEN submit WR/WO to refill oiler and continue surveillance.

2.8.10 Open DG2 Air Box Trap ST-68 Bypass (FO-1066D) AND check for water in effluent.

A. Close FO-1066D.

B. IF there is water in effluent, THEN submit WR/WO and continue surveillance.

2.8.11 Stop diesel (pushbutton on C108).

2.8.12 Record Time/Date of DG2 stop.

Time/Date N/A

2.8.13 IF time to exceed 3750 volts is greater than 15 seconds, THEN perform the following.

A. Inform the Shift Manager.

B. Declare DG2 inoperable.

C. Discontinue the test.

2.8.14 Place Engine Control selector switch in REMOTE.

NOTE

Starting diesel generator from each bank (north and south) satisfies quarterly ASME stroking requirements of Emergency Diesel Generator Air Relay Valves to K-4B (CV-5237 and CV-5239). Failure of starter to engage does not render diesel inoperable provided opposite starter bank maintains required 15 second start time.

2.8.15 Station an operator at the diesel to verify opposite starter bank is used on second (control room) start AND verify presence of oil in starter exhaust. N/A

2.9 Verification of Remote Start Capability

2.9.1 Reset or acknowledge all alarms on local alarm panel K1613. JMF

2.9.2 Record initial DG2 Watt-Hour Meter (C20) reading: JMF

8525 KWH

NOTE

Be prepared to clock elapsed time from start signal until voltage exceeds 3750 volts.

2.9.3 Perform remote start of diesel as follows:

A. Start, or verify started, Diesel Generator Room Exhaust Fans AND verify dampers open on C19 or locally.

1. Verify VEF-24C running. SAS

2. Check damper TV-7902A open. SAS

3. Verify VEF-24D running. SAS

4. Check damper TV-7902B open. SAS

5. Record verification in section 3.0. SAS

B. Verify DG2 Volts Select switch NOT in OFF (C10). SAS

C. Simultaneously depress START pushbutton AND start the stopwatch. SAS

D. WHEN DG2 voltage exceeds 3750 volts, THEN stop the watch. SAS

2.9.4 Record time elapsed from operation of start switch until voltage exceeded 3750 volts on panel C10 in section 3.0. SAS

2.9.5 IF time is greater than 15 seconds, THEN perform the following.

A. Inform Shift Manager. SAS

B. Declare DG2 inoperable. SAS

C. Discontinue test. SAS

2.9.6 Verify SERV WTR to DG2 CLRS (CV-3807) is open and record verification in section 3.0. _____

2.9.7 Record Time/Date of DG2 start. _____

Time/Date _____/_____

2.9.8 Gather the following data and record parameters per log OPS-A15b: _____

- Each DG2 Voltage Phase (1-2, 2-3, 3-1)
- DG2 Field Amps
- Voltage Regulator Control current

2.10 Parallel of diesel generator with grid:

CAUTION

With the DG paralleled to the grid, grid disturbance could cause damage to the DG.

2.10.1 IF DG2 is paralleled to the grid,
AND the reactor trips,
OR offsite power is lost,
THEN follow "DG operation when paralleled to the grid and the reactor trips or offsite power is lost" section of this procedure.

2.10.2 Turn Synchronize switch ON for DG2 Output Breaker (A-408). _____

2.10.3 Verify smooth voltage and frequency control by exercising controls on C10. _____

NOTE

ES Bus A4 voltage (running) and DG2 voltage (incoming) can be compared by using SPDS. Comparison points are:

- E1A4 (A4 Voltage)
- E1DG2 (DG2 Voltage)

2.10.4 Adjust DG2 voltage regulator to match RUNNING and INCOMING voltages (DG2 is INCOMING). _____

2.10.5 Adjust DG2 governor control until frequency is ~60 HZ with synchroscope rotating slowly in FAST direction. _____

CAUTION

- A delay in loading diesel after closing output breaker may result in a motoring trip.
- In parallel operation, maximum allowed reactive load is 1200 KVAR out and 500 KVAR in at full load.
- Maximum current is 450 amps. Do not exceed except in emergency.

NOTE

- If synchroscope is rotating too fast, sync-check relay will prevent breaker from closing.
- Gradual and uniform load changes minimize engine wear and internal stresses. A 100% load change requires ~90 sec.
- If available, SPDS point J1DG2 or EDS Display should be used for DG load.
- Momentary transients above or below the required loading value due to variations in load do not invalidate the test.

2.10.6 As synchroscope approaches 12 o'clock position (~5 min 'til), close breaker A-408. _____

A. Immediately begin gradually raising load to full load (2750 KW) using DG2 governor control. Take ~90 seconds. _____

B. Maintain ~0 kilovars using DG2 voltage regulator. _____

2.10.7 Record Time/Date when DG2 output is between 2625 and 2750 KW. _____

Time/Date _____/_____

2.10.8 Turn Synchronize switch OFF. _____

2.11 Perform the following as applicable:

2.11.1 IF this is a regularly scheduled monthly or quarterly test, THEN request Chemistry Department to sample Emergency Diesel Fuel Tank T-57B per Sampling Diesel Fuel (1618.010) and cooling water per Sampling Emergency Diesel Generator's Cooling Water (1618.014). _____

_____
Name of Chemist Informed

2.11.2 IF this is a local start test, THEN record stroking of opposite DG2 starter bank, in section 3.0. _____

2.11.3 IF this is a local start test, THEN check for presence of oil in exhaust of starter used. _____

A. IF no indication of oil, THEN submit WR/WO to refill oiler and continue surveillance. _____

2.11.4 Verify cylinder drain cock tool and engine jacking mechanism returned to appropriate storage location. _____

2.11.5 IF requested by SYE, THEN open DG2 Air Box Trap ST-68 Bypass (FO-1066D). _____

A. Close FO-1066D. _____

2.12 WHEN DG2 has operated for 15 minutes between 2625 and 2750 KW, THEN perform the following:

2.12.1 IF this is a regularly scheduled quarterly test as noted in Initial Conditions, THEN notify vibration data collection personnel to take P-16B vibration data when the pump is running. Otherwise N/A this step and P-16B vibration data in section 3.0. _____

CAUTION

Running DG2 Fuel Transfer Pump (P-16B) in HAND can cause overflow of DG2 Fuel Oil Day Tank T-30B. Do not allow tank to fill >250 gallons.

NOTE

- Completion of the following steps satisfies quarterly ASME stroking requirements of P-16B Outlet Check Valve(FO-8B).
- 35 minutes ensures the EDG has consumed sufficient fuel oil to require Fuel Transfer Pump operation.

2.12.2 Monitor day tank level to determine if DG2 Fuel Transfer Pump (P-16B) is running. _____

A. IF P-16B is not running, AND at least 35 minutes of EDG operation has elapsed, THEN verify T-30B ≤ 220 gal. and start P-16B in HAND. _____

2.12.3 Monitor day tank level until level rises by at least 10 gallons. _____

A. Record ability of P-16B to raise level in section 3.0. _____

B. Record T-30B level here and in section 3.0. _____

_____ gal (LG-5237)

2.12.4 IF P-16B is in HAND, THEN return P-16B to AUTO. _____

2.13 Data gathering after 30 minutes between 2625 and 2750 KW:

2.13.1 Record DG2 parameters per DG2 Logsheet (OPS-A15b). _____

2.13.2 Record local DG2 Emergency Diesel Fuel Tank T-57B Level (PDIS-5212) (in fuel vault). _____

_____ inches.

2.13.3 IF tank level is <148", THEN initiate corrective actions. _____

2.13.4 IF this is a regularly scheduled quarterly test, THEN stroke DG2 Emerg Diesel Fuel Tank T-57B crossover (FO-10B) as follows: _____

A. Stroke FO-10B open, then closed. _____

1. Record results in section 3.0. _____

2.13.5 IF this is a regularly scheduled quarterly test, THEN verify vibrometer readings taken per data sheet of this supplement. _____

2.13.6 Check SPDS EDS VTAL screen and verify diesel generator parameters display approximately the same value as C10 instrumentation for: _____

- DG2 Power
- DG2 Voltage
- DG2 Frequency

A. Record in section 3.0. _____

NOTE

- The fuel oil filter "bypass" sight glass (farthest from the engine) should be empty in normal operation, if fuel oil is in this sight glass, the fuel oil filter should be changed.
- The "return fuel" sight glass (nearer the engine) passes returning fuel from the injectors to the day tank. This sight glass should normally be full. Air bubbles in this sight glass with the fuel priming pump running and the engine stopped indicates air entering the suction of the pump. Bubbles appearing only when engine is running indicates leaky valves in fuel injectors. Little or no fuel in the sight glass indicates insufficient fuel to the engine.

2.13.7 Check duplex fuel oil filter sight glasses. _____

A. Submit a WR/WO for repairs, as necessary, and continue surveillance. _____

2.14 Data gathering after one hour between 2625 and 2750 KW:

2.14.1 Record DG2 parameters per log OPS-A15b. _____

2.14.2 Contact Chemistry and verify cooling water corrosion inhibitor concentration in-spec. _____

NOTE

The following values are given to help determine when diesel temperatures have stabilized, and are not intended to limit operation:

- Scavenging Pump Disc. Temp. - 190°F - 195°F
- Water Pump Suction Temp. - 155°F - 160°F
- Water Leaving Engine Temp. - 165°F - 175°F

2.15 WHEN one hour between 2625 and 2750 KW has elapsed AND engine water and oil temperatures have stabilized, THEN perform the following:

2.15.1 IF this is a test following a series of Supplement 12 Operability Tests, THEN continue full load operation for a total time of 2 hours. _____

2.15.2 IF this test is to prove operability following significant maintenance, OR requested by System Engineering, THEN perform extended run as follows:

A. Raise load between 2730 and 2860 KW using DG2 governor control. _____

B. Maintain ~0 kilovars using DG2 voltage regulator. _____

C. Record Time/Date when DG2 output is between 2730 and 2860 KW: _____
Time/Date _____/_____

D. Record initial time between 2625 and 2750 KW in Section 3.0. _____

E. Continue taking hourly DG logs per DG2 Logsheet (OPS-A15b) ←

F. WHEN DG2 has operated for two hours between 2730 and 2860 KW, _____
THEN reduce load between 2625 and 2750 KW.

1. Record Time/Date _____/_____ _____

2. Record run time between 2730 and 2860 KW in section 3.0. _____

NOTE
Additional run time will be determined by System Engineering.

G. IF additional run time between 2625 and 2750 KW is requested by System Engineering, _____
THEN maintain load between 2625 and 2750 KW until requested duration has elapsed.

2.15.3 Remove diesel generator from parallel operation as follows:

A. Record Time/Date at which load reduction is commenced. _____
Time/Date _____/_____

CAUTION
A delay in opening output breaker at 100 KW when unloading diesel may result in a motoring trip.

NOTE
Gradual and uniform load changes minimize engine wear and internal stresses. A 100% load change requires ~90 sec.

B. Gradually unload DG2 to ~100 KW using DG2 governor control while minimizing kilovars using DG2 voltage regulator. Take ~90 seconds. _____

C. Open DG2 Output Breaker (A-408). _____

D. Record Time/Date A-408 Opened: _____

Time/Date _____/_____

E. IF additional run time per System Engineering's request was performed, THEN record the additional runtime between 2625 and 2750 KW in section 3.0. _____

NOTE

Total runtime between 2625 and 2750 KW is as follows:

- If additional runtime was performed, the total runtime is the initial time between 2625 and 2750 KW added to any additional runtime between 2625 and 2750 KW,

OR

- If no additional runtime was performed, the total runtime is the difference in time from when the EDG is between 2625 and 2750 KW and the time at which load reduction began.

F. Record EDG initial run time as follows: _____

- IF extended run was performed, THEN record total time DG2 between 2625 and 2750 KW in section 3.0.

- IF extended run was NOT performed, THEN record initial time DG2 between 2625 and 2750 KW in section 3.0.

2.15.4 Stop diesel as follows:

A. Adjust frequency to 60 HZ using DG2 governor control. _____

B. Adjust voltage to 4160 volts using DG2 voltage regulator. _____

C. WHEN DG2 has run for 17-minutes unloaded, THEN depress STOP pushbutton. _____

D. Record Time/Date DG2 stopped. _____

Time/Date _____/_____

2.15.5 Complete DG Start/Load-Run Information Sheet (Form 1104.036A). _____

NOTE

The following Functional Capability Test (Optional) is performed at the request of System Engineering. When required, the DG must be started within 5 minutes. If not performed, N/A subsection 2.16 and GO TO 2.17.

2.16 Functional Capability Test (Optional)

2.16.1 Time starting of DG2 from control room as follows:

A. Simultaneously depress DG2 START pushbutton (C10) and start the stopwatch. _____

B. Record time elapsed from operation of start switch until voltage exceeds 3750 volts in section 3.0, Functional Capability Test Table. _____

2.16.2 Parallel of diesel as follows:

NOTE

ES Bus A4 voltage (running) and DG2 voltage (incoming) can be compared by using SPDS. Comparison points are:

E1A4 (A4 Voltage)
E1DG2 (DG2 Voltage)

A. Inform dispatcher that diesel generator is ready for loading. _____

B. Turn Synchronize switch ON for DG2 Output Breaker (A-408). _____

C. Verify voltage and frequency control by exercising controls on C10. _____

D. Adjust DG2 voltage regulator to match RUNNING and INCOMING voltages. _____

E. Adjust DG2 governor control until frequency is ~60 HZ with synchroscope rotating slowly in FAST direction. _____

CAUTION

A delay in loading diesel after closing output breaker may result in a motoring trip.

NOTE

- If synchroscope is rotating too fast, sync-check relay will prevent breaker from closing.
- Prepare to clock diesel loading. Full load will be applied within 30 seconds of closing breaker.

F. As synchroscope approaches 12 o'clock position (~5 min 'til), simultaneously close breaker A-408 AND start the stopwatch. Using DG2 governor control, raise load to 2750 KW in <30 seconds. _____

G. WHEN DG2 load is ≥2750 KW, THEN stop the stopwatch. _____

H. Record time elapsed from when output breaker closed to full load in section 3.0, Functional Capability Test Table. _____

I. Turn Synchronize switch OFF. _____

2.16.3 WHEN DG2 has operated for 15 minutes at 2625 to 2750 KW, THEN remove DG2 from parallel operation as follows:

CAUTION

A delay in opening output breaker at 100 KW when unloading diesel may result in a motoring trip.

NOTE

Gradual and uniform load changes minimize engine wear and internal stresses. A 100% load change requires ~90 sec.

A. Gradually unload DG2 to ~100 KW using DG2 governor control while minimizing kilovars using DG2 voltage regulator. Take ~90 seconds. _____

B. Open DG1 Output Breaker (A-408). _____

2.16.4 Stop diesel as follows:

A. Adjust frequency to 60 HZ using DG2 governor control. _____

B. Adjust voltage to 4160 volts using DG2 voltage regulator. _____

C. Record DG2 Watt-Hour meter reading _____

_____ KWH

D. WHEN DG2 has run for 17-minutes unloaded, THEN depress DG2 STOP pushbutton. _____

2.16.5 Complete DG Start/Load-Run Information Sheet (Form 1104.036A). _____

2.17 Restoration

2.17.1 Record DG2 ENGINE TOTAL HRS (C108): _____hrs. _____

2.17.2 Record DG2 Watt-hour meter reading (C20): _____

_____ KWH. _____

2.17.3 Verify associated critical and non-critical alarms clear: _____

- EDG2 CRITICAL TROUBLE (K01-C4)
- EDG2 NON-CRITICAL TROUBLE (K01-D4)

2.17.4 WHEN one of the following sets of conditions are met,

- Ambient temperature is ≤40°F AND diesel has been stopped for at least 5 minutes
- Ambient temperature is >40°F AND diesel has been stopped for at least 20 minutes

AND IF conditions allow,
THEN return EDG Ventilation to AUTO as follows:

A. Verify VEF-24C handswitch to AUTO. _____

B. Verify VEF-24D handswitch to AUTO. _____

C. Verify that at least one of the following cycles off in AUTO:

- VEF-24C _____
- VSF-24D _____

2.17.5 WHEN DG2 has been stopped for at least 20 minutes, _____
THEN close SERV WTR to DG2 CLRS (CV-3807).

2.18 Verify the following valves closed:

- K-4B Crankcase Pressure PI-5244B ISOL (FO-5244B) _____
- K-4B Air Box Pressure PI-5245B ISOL (FO-5245B) _____

2.19 IF this is a regularly scheduled monthly or quarterly test, THEN notify chemists to obtain following samples. _____

- DG2 Fuel Oil Day Tank T-30B per 1618.028.
- DG2 lube oil sample per 1618.039.

2.20 Verify vibrometer readings recorded in section 3.0 as required. _____

2.21 Record AND review required data in Trend Spreadsheet.

Recorded and reviewed by (SE/SRO) _____ Date _____

2.21.1 IF available, THEN attach copies of graphs. _____

SUPPLEMENT 2

3.0 ACCEPTANCE CRITERIA

3.1 Record values observed during DG2 testing and compare with "Limiting Range For Operability." _____

TEST QUANTITY	INSTRUMENT	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (CIRCLE YES OR NO)
T-31B1/B2	PI-5236 or (PI-5238)	195	N/A	>175 PSIG	(1) (YES) NO
T-31B3/B4	PI-5239 or (PI-5240)	200	N/A	>175 PSIG	(1) (YES) NO
DG2 local start time	M&TE # N/D	NA sec	N/A	>3750 Volts within 15 sec	(2) (N/A) YES NO
DG2 remote start time	M&TE # DES079	25 sec	N/A	>3750 Volts within 15 sec	YES (NO)
SV-5237 and CV-5237 FO-164	Stroke and fail safe testing verified by satisfactory starting of DG2 on north starter bank within 15 seconds and disengagement of starter mechanism after start.				(2) N/A (1) YES NO
SV-5239 and CV-5239 FO-163	Stroke and fail safe testing verified by satisfactory starting of DG2 on south starter bank within 15 seconds and disengagement of starter mechanism after start.				(2) N/A (1) YES NO
CV-3807	N/A	N/A	N/A	Valve opens on engine start	(1) YES NO
P-16B	N/A	N/A	N/A	Raises level with DG2 running	YES NO
DG2 Day Tank T-30B Level	LG-5237	gal	N/A	≥160 gallons	YES NO
FO-8B	Stroke verified by day tank level rising with DG running fully loaded.				YES NO
P-16B Pump horizontal vibration	vibrometer	in/sec	0.115 in/sec	0.276 in/sec	N/A YES NO
P-16B Pump vertical vibration	vibrometer	in/sec	0.105 in/sec	0.252 in/sec	N/A YES NO

SUPPLEMENT 2

3.1 continued

TEST QUANTITY	(Circle one used) INSTRUMENT	MEASURED VALUES	ACCEPTABLE NORMAL RANGE	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (CIRCLE YES OR NO)
FO-10B	N/A	(✓) If Valve strokes without binding ( )			N/A (1) YES NO
DG2 Power	SPDS VTAL	(✓) if ≅ C10 value ( )	approx. equal to C10 value	approx. equal to C10 value	(1) YES NO
DG2 Voltage	SPDS VTAL	(✓) if ≅ C10 value ( )	approx. equal to C10 value	approx. equal to C10 value	(1) YES NO
DG2 Frequency	SPDS VTAL	(✓) if ≅ C10 value ( )	approx. equal to C10 value	approx. equal to C10 value	(1) YES NO
VEF-24C	N/A	N/A	N/A	Runs	(1) YES NO
Damper TV-7902A	N/A	N/A	N/A	Opens	(1) YES NO
VEF-24D	N/A	N/A	N/A	Runs	(1) YES NO
Damper TV-7902B	N/A	N/A	N/A	Opens	(1) YES NO
VEF-24C or VEF-24D	N/A	N/A	N/A	1 of 2 operable	YES NO
Initial time DG2 between 2625 and 2750 KW	N/A	min	N/A	≥1 hour and until water and oil temps. stabilized	YES NO
DG1 time between 2730 and 2860 KW	N/A	(3) min	N/A	≥2 hours	N/A
Addnl time DG2 between 2625 and 2750 KW	N/A	(3) min	As directed by SYE	N/A	N/A
Total time DG2 between 2625 and 2750 KW	N/A	(3) min	N/A	N/A	N/A

FUNCTIONAL CAPABILITY TEST TABLE

TEST QUANTITY	INSTRUMENT	MEASURED VALUES	LIMITING RANGE FOR OPERABILITY	IS DATA WITHIN LIMITING RANGE? (CIRCLE YES OR NO)
DG2 Start time	M&TE #	sec	Voltage >3750 within 15 sec	YES N/A NO
Time to 2750KW	M&TE #	sec	≤30 sec	YES N/A NO

3.2 IF "NO" is circled in the right hand column, THEN perform the following: _____

- Immediately notify the Shift Manager,
- Declare DG2 or component inoperable,
- verify a Condition Report initiated,
- Initiate corrective action.

Reference Tech Specs for applicable Conditions and Required Actions. 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.

3.3 IF any measured value does not fall within "Acceptable Normal Range", THEN initiate corrective action. _____

(1) If "NO" is circled, declare that component only inoperable.

(2) If remote start only N/A.

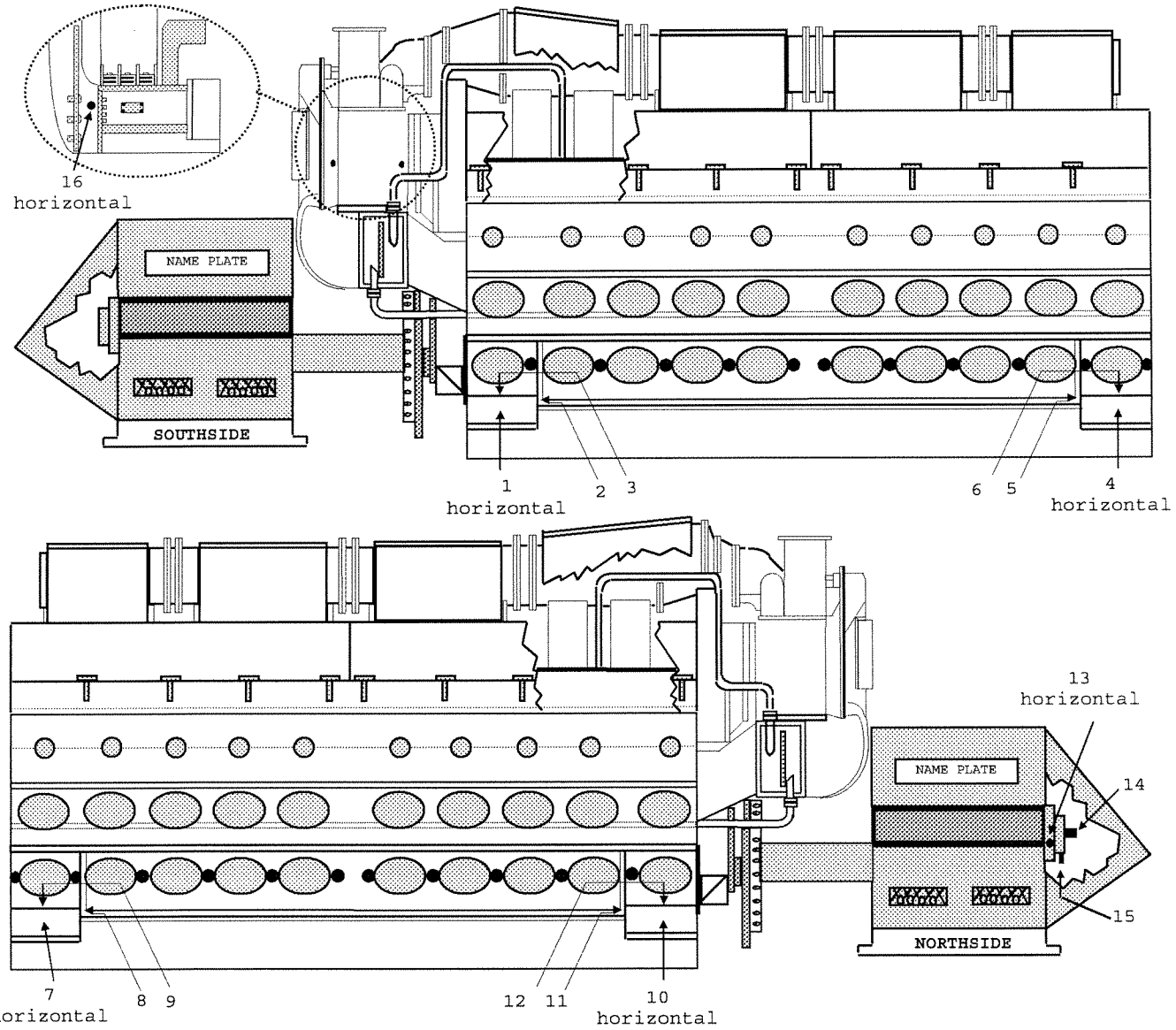
(3) N/A unless test was to prove operability following significant maintenance or requested by System Engineering.

Performed by _____ Operator Date/Time 9/12/05 1000

Performed by _____ Operator Date/Time _____

Performed by _____ Operator Date/Time _____

SUPPLEMENT 2



POINT NO.	VELOCITY (IN/SEC.)
1	
2	
3	
4	

POINT NO.	VELOCITY (IN/SEC.)
5	
6	
7	
8	

POINT NO.	VELOCITY (IN/SEC.)
9	
10	
11	
12	

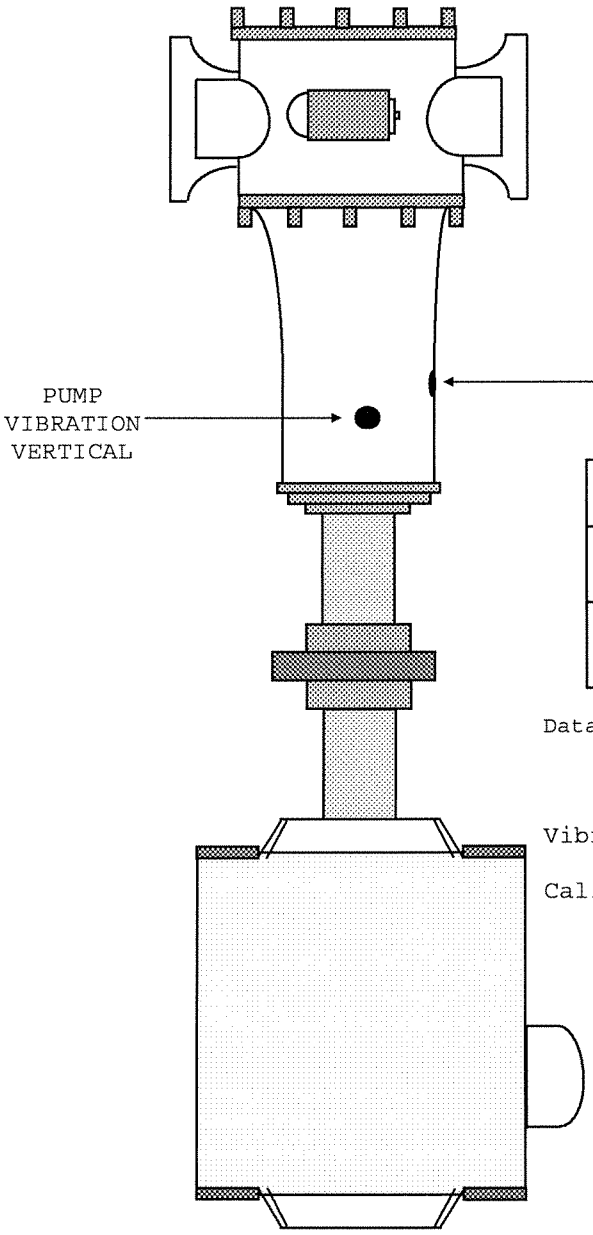
POINT NO.	VELOCITY (IN/SEC.)
13	
14	
15	
16	

Emergency Diesel # _____ Data Collected By _____ Date _____

Vibrometer M&TE # _____ Calibration Due Date _____

SUPPLEMENT 2

P-16B



Direction	Velocity (in/sec)
Horizontal	
Vertical	

Data Collected By _____

Date _____

Vibrometer M&TE # _____

Calibration Due Date _____

Hold vibrometer probe tip firmly against the survey point marker, perpendicular to the surface. Locations of markers are depicted above.

SUPPLEMENT 2

4.0 SHIFT MANAGER REVIEW AND ANALYSIS

(circle one)

4.1 Do all measured values recorded in the Acceptance Criteria section fall within the specified LIMITING RANGE 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", THEN initiate corrective action and raise test frequency to once per 6 weeks until resolved satisfactorily. _____

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

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

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

4.5 Have all 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 _____

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources - Operating

LCO 3.8.1 The following AC electrical power sources shall be OPERABLE:

a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System; and

b. Two diesel generators (DGs) each capable of supplying one train of the onsite Class 1E AC Electrical Power Distribution System.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for OPERABLE required offsite circuit. AND A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable. AND	1 hour AND Once per 12 hours thereafter 24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3 ----------NOTE---------- Startup Transformer No. 2 may be removed from service for up to 30 days for preplanned preventative maintenance. This 30 day Completion Time may be applied not more than once in any 10 year period. The provisions of LCO 3.0.4 are not applicable to Startup Transformer No. 2 during this 30 day preventative maintenance period. ---------- Restore required offsite circuit to OPERABLE status.	72 hours AND 10 days from discovery of failure to meet LCO
B. One DG inoperable.	B.1 Perform SR 3.8.1.1 for OPERABLE required offsite circuit(s). AND B.2 Declare required feature(s) supported by the inoperable DG inoperable when its redundant required feature(s) is inoperable. AND B.3.1 Determine OPERABLE DG is not inoperable due to common cause failure. OR	1 hour AND Once per 12 hours thereafter 4 hours from discovery of Condition B concurrent with inoperablity of redundant required feature(s) 24 hours

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3.2 Perform SR 3.8.1.2 for OPERABLE DG. AND B.4 Restore DG to OPERABLE status.	24 hours 7 days AND 10 days from discovery of failure to meet LCO
C. Two required offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable. AND C.2 Restore one required offsite circuit to OPERABLE status.	12 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s) 24 hours
D. One required offsite circuit inoperable. AND One DG inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.6, "Distribution Systems – Operating," when Condition D is entered with no AC power source to any train. ---------- D.1 Restore required offsite circuit to OPERABLE status. OR D.2 Restore DG to OPERABLE status.	 12 hours 12 hours
E. Two DGs inoperable.	E.1 Restore one DG to OPERABLE status.	2 hours

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS - Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with Reactor Coolant System (RCS) temperature > 350°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more trains inoperable.	A.1 Restore train(s) to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Reduce RCS temperature to ≤ 350°F.	6 hours 12 hours
C. Less than 100% of the ECCS flow equivalent to a single OPERABLE train available.	C.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.2.2	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1

LCOs shall be met during the MODES or other specified conditions in the Applicability, except as provided in LCO 3.0.2 and LCO 3.0.7.

LCO 3.0.2

Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5 and LCO 3.0.6.

If the LCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.

LCO 3.0.3

When an LCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, the unit shall be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in:

a. MODE 3 within 7 hours;

b. MODE 4 within 13 hours; and

c. MODE 5 within 37 hours.

Exceptions to this Specification are stated in the individual Specifications.

Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the actions required by LCO 3.0.3 is not required.

LCO 3.0.3 is only applicable in MODES 1, 2, 3, and 4.

LCO 3.0.4

When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall not be made except when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time. This Specification shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-SRO-CHEM1

UNIT: 1 REV # 0 DATE: _____

TUOI NUMBER: A1JPM-SRO-CHEM1

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: 2.3 SRO: 2.9 KA REFERENCE: 2.1.34

APPROVED FOR ADMINISTRATION TO: RO: _____ SRO: X

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

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: PERFORM LAB: _____

POSITION EVALUATED: RO: N/A SRO: X

ACTUAL TESTING ENVIRONMENT: SIMULATOR: X PLANT SITE: _____ LAB: _____

TESTING METHOD: SIMULATE: _____ PERFORM: _____

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.

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 your office and has given you, the Shift Manager, 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 within 6 hours.

TASK PERFORMANCE AIDS: 1000.042

INITIATING CUE:

As Shift Manager, review the 1000.042A form for out of specification Feedwater chlorides.

CRITICAL ELEMENTS (C) 3

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
NOTE: Inform trainee that continuous monitor readings correspond with sample results.					
	1. 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 Chemistry suspects a bad polisher to be the source of the chlorides.					
	2. Identify and isolate sources of impurity ingress.	Inquired as to results of searches for source of chloride in-leakage.	_____	_____	_____
(C)	3. Refer to Attachment 3 1000.042.	Referred to Att. 3 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 as quickly as possible (typically within six hours) instead of the 100 hours allowed for Action Level 2.	_____	_____	_____

END

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- The plant had been operating at 100% for 215 days.
- The shift chemist has just arrived in your office and has given you, the Shift Manager, form 1000.042A to review.

INITIATING CUE:

As Shift Manager, review the 1000.042A form for out of specification Feedwater chlorides.

EVENT DESCRIPTION	OCCURRENCE DATE:	TIME:	REACTOR POWER:
High Chlorides in Feedwater A+B	9-13-05	0840	100 %
PLANT STATUS PRIOR TO OCCURRENCE	Power Operation		
COMPONENT OR SYSTEM AFFECTED	Feedwater A & B Chlorides		
DESCRIPTION OF CONDITION	Chlorides > 5 ppb		

PARAMETER	TEST RESULTS	LIMIT	PARAMETER	TEST RESULTS	LIMIT	PARAMETER	TEST RESULTS	LIMIT
A FW Chlorides	11.8	< 5	B FW Chlorides	13.4	< 5			

ACTION RECOMMENDATIONS

PROCEDURE REQUIREMENTS:	PAGE NUMBER:
1000.042 Page 4 of 21	4
CHEMISTRY RECOMMENDATIONS: Return to below action level two within 100 hours.	

MONITORING ACTIVITY

SAMPLING FREQUENCY: Daily			
TIME CLOCK ENDS:	DATE: 9-17-05	TIME: 1240	
CHEMIST REPORTING OUT-OF-SPEC.: Gary Petri	DATE: 9-13-05	TIME: 1130	
☐ Hideout Return for planned outage. If marked, then Shift Manager reviews may be N/A.			
REVIEWED BY SHIFT MANAGER:	DATE:	TIME:	

IN SPEC PARAMETER	TEST RESULTS	LIMIT	DATE / TIME	IN SPEC PARAMETER	TEST RESULTS	LIMIT	DATE / TIME	IN SPEC PARAMETER	TEST RESULTS	LIMIT	DATE / TIME

CHEMIST VERIFYING IN SPEC. CONDITION:	DATE: TIME:	NOTES:

CORRECTIVE ACTION TAKEN BY OPERATIONS:

REVIEWED BY SHIFT MANAGER:	DATE: TIME:

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: STEAM GENERATOR WATER CHEMISTRY MONITORING- UNIT ONE SET #	DOCUMENT NO. 1000.042	CHANGE NO. 013-01-0
	WORK PLAN EXP. DATE N/A	TC EXP. DATE N/A
	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**Effective Communication**
Distraction/Interruption	**Questioning Attitude**
Multiple Tasks	**Placekeeping**
Overconfidence	**Self Check**
Vague or Interpretive Guidance	**Peer Check**
First Shift/Last Shift	**Knowledge**
Peer Pressure	**Procedures**
Change/Off Normal	**Job Briefing**
Physical Environment	**Coaching**
Mental Stress (Home or Work)	**Turnover**

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	1000.006A	050-00-0

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this procedure is to identify a secondary water chemistry monitoring program to maximize the availability and operating life of major components such as the steam generators and the turbine.

2.0 SCOPE

The scope of this program is limited to:

2.1 Unit One;

2.2 Identification of a sampling schedule for the critical parameters and control points for these parameters;

2.3 Identification of the procedures used to measure the values of the critical parameters;

2.4 Identification of process sampling points;

2.5 Procedure for the recording and management of data;

2.6 Procedure defining corrective actions for off-control point chemistry conditions; and

2.7 A procedure identifying the authority responsible for the interpretation of the data and the sequence and timing of administrative events required to initiate corrective action.

3.0 REFERENCES

3.1 REFERENCES USED

3.1.1 PWR Secondary Water Chemistry Guidelines - Revision 5. EPRI TR-102134, Revision 5, Final Report, May, 2000, prepared by PWR Secondary Water Chemistry Guidelines Revision Committee

3.1.2 Babcock & Wilcox BAW-1385 Water Chemistry Manual

3.1.3 1052.002, Chemistry Forms

3.1.4 1605.002, Analyses Using the UV/VIS Spectrophotometer

3.1.5 1605.022, Determination of Dissolved Oxygen (Chemetrics Comparator Method)

3.1.6 1605.026, Operation of AA-SCAN 1 AA/AE Spectrophotometer

3.1.7 1605.027, Determination of Solids

3.1.8 1605.038, Determination of Hydrazine - High Range (Titration Method)

3.1.9 1605.063, Chemical Analysis Using the Ion Chromatograph

3.1.10 1605.077, Determination of Insoluble and Soluble Metals

3.1.11 1605.080, Operation of the Smith-Hieftje 4000 AA/AE Spectrophotometer

3.1.12 1605.083, Operation of Benchtop pH Meters

3.1.13 1605.084, Operation of Portable Conductivity Meters

3.1.14 1606.017, Operation of the Orbisphere Oxygen Detectors

3.1.15 1606.042, Operation of Unit 1 Hydrazine Analyzers

3.1.16 1606.041, Operation of Unit 1 Inline Specific and Cation Conductivity Meters

3.1.17 1606.044, Operation of Unit 1 Inline pH Meters

3.1.18 1606.045, Operation of Unit 1 Leeds & Northrup Model 7931 Dissolved Oxygen Analyzers

3.1.19 1606.046, Operation of Unit 1 Sodium Analyzers

3.1.20 1606.049, Operation of the Dionex Series 8100 On-Line Ion Chromatograph

3.1.21 1606.050, Operation of B&W Corrosion Product Samplers

3.1.22 1618.002, Collecting Unit 1 Secondary Samples

3.1.23 Unit 1 TS 5.5.10.a-f. Section 2.0 of this procedure states the license requirements.

3.1.24 Feedwater Oxygen Control, S.G. Sawochka, Nov 8, 1999

3.2 COMMITMENTS

None

4.0 DEFINITIONS

4.1 ACTION LEVEL 1 - Corrective actions should 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 should be performed to justify continuing to operate above Action Level 1.

4.2 Action Level 2 - Corrective actions should 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 should be in the hot standby condition within an additional 24 hours. An engineering evaluation should 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 - Shut down 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. Regardless of the duration of the excursion into Action Level 3, the plant should be taken to hot or cold shutdown. 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 HOT STANDBY - Reactor critical but <2% reactor power.

4.6 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.

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

4.8 STARTUP - Circulating secondary system at >200°F RCS temperature and reactor not yet critical.

4.9 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.

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.

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 3 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.

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 3 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.

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.

6.8.6 Refer to Attachments 4, 5, and 6 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.

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.

6.14 Deviation from procedurally specified recommendations (except in an emergency situation) requires the specific approval of the Plant Manager, Operations; General Manager, Plant Operations or Vice President, Operations ANO in conjunction with the Superintendent, Chemistry. This approval shall be documented on Form 1000.042B.

7.0 ATTACHMENTS AND FORMS

7.1 ATTACHMENTS

7.1.1 Attachment 1, Cold Shutdown/Wet Layup (RCS $\leq$200°F)

7.1.2 Attachment 2, Startup, Hot Standby, and Reactor Critical at <15% Reactor Power (RCS >200°F, <15% Reactor Power)

7.1.3 Attachment 3, Power Operation ($\geq$15% Reactor Power)

7.1.4 Attachment 4, Cold Shutdown/Wet Layup Corrective Actions

7.1.5 Attachment 5, Startup, Hot Standby, and Reactor Critical at <15% Reactor Power Corrective Actions

7.1.6 Attachment 6, Power Operation ($\geq$15% Reactor Power) Corrective Actions

7.2 FORMS

7.2.1 Form 1000.042A, Unit 1 Steam Generator Monitoring Report

7.2.2 Form 1000.042B, Unit 1 Steam Generator Monitoring Waiver

ATTACHMENT 1 Page 1 of 2

COLD SHUTDOWN/WET LAYUP
(RCS ≤200°F)

Control Parameters

NOTE

If the duration of the outage is expected to be less than seven days from cold shutdown to startup, it is not necessary to place the steam generators in full wet layup (in accordance with the pH and hydrazine values below). If after seven days of low hydrazine wet layup and startup is not anticipated within 48 hours, full wet layup should be initiated. Unless the steam generators are being drained for maintenance, the steam generators shall be filled with feedwater containing greater than 5 ppm hydrazine and less than 100 ppb dissolved oxygen. A nitrogen over-pressure should be established, unless condenser vacuum is being maintained.

Parameter	Frequency (A)	Normal Value	Initiate Action	Value Prior to Heatup (B)
Steam Generator Sample				
pH	(C)	≥9.8	≤9.5	---
Hydrazine, ppm	(C)	≥75, ≤500	<75, >500	---
Sodium, ppb	(C)	≤1000	>1000	≤100
Chloride, ppb	(C)	≤1000	>1000	≤100
Sulfate, ppb	(C)	≤1000	>1000	≤100
Oxygen, ppb (H)	(C)	≤100		≤100
Steam Generator Fill Source				
Dissolved O2, ppb	Daily (D) (E)	≤100	>100	

Diagnostic Parameters

Parameter	
Steam Generator Nitrogen Overpressure, (F) PSIG	- minimize oxygen ingress to the steam generators during wet lay-up
Steam Generator Hideout Return (G)	- Typical samples collected are Na, Cl, SO4, K, Mg, Ca, Al and SiO2
Steam Generator Fill Source	
Conductivity, µmho/cm Daily	Monitor for ionic impurity ingress to the steam generators

COLD SHUTDOWN/WET LAYUP
(RCS $\leq$200°F)

(A) When the secondary system is in feedwater cleanup, it may not be possible to obtain a steam generator sample. The amount of time for feedwater recirculation prior to heatup should be minimized as much as possible.

(B) The "Value Prior to Heatup" shall be verified by the Chemistry department on Form 1000.042A prior to exceeding 200°F RCS temperature. This may be based on the most recent chemistry values being in spec for value prior to heatup and at least one drain and fill being performed to remove wet lay-up chemicals prior to heatup or by sampling the OTSGs.

(C) Sampling should be initiated within 24 hours after initial fill or after significant water additions and then sample every other day until stable, then weekly. Wet layup chemistry should be established within 48 hours of filling. If outage maintenance results in the inability to obtain a scheduled sample, then the Chemistry Superintendent or designee should review the analysis data and determine whether the change in frequency is acceptable. Document the change on Form 1052.002A or in the Chemistry database.

(D) Deoxygenated water should be employed during the initial fill of the steam generator subsequent to a shutdown, during feed and bleed operations, and during any fill subsequent to a draindown. It is recognized that testing of the Emergency Feedwater system may result in limited ingress of oxygenated water to the steam generators during brief periods of time since EFW source water may be high in oxygen. However, such transients should be minimized to the extent possible.

(E) Conformance to oxygen limits should be verified prior to any fill operation, except for Emergency Feedwater testing.

(F) A nitrogen overpressure should be maintained on the steam generators when personnel safety will not be compromised.

(G) Hideout return assessments generally should be based on data collected during fill/drain operations after shutdown.

(H) Routine monitoring not required prior to initial heatup if hydrazine concentration is within normal range.

ATTACHMENT 2 Page 1 of 3

STARTUP, HOT STANDBY, AND REACTOR CRITICAL AT <15% REACTOR POWER
(RCS >200°F, <15% REACTOR POWER)

Feedwater
Control Parameters

Parameter	Frequency	Initiate Action
Feedwater Sample		
pH	3/day	(A)
Dissolved Oxygen, ppb		
Startup	Continuous	>100 (B)
Hot Standby	Continuous	>10 (B)
Reactor Critical	Continuous	>5 (B)
Hydrazine, ppb	3/Day	<8 x CPD[O_2] (B)(C) <50 ppb (B)
Suspended Solids, ppb		
Startup	3/Day	>100 (B)
Hot Standby/ Reactor Critical @ <15% Reactor Power	Daily	>10 (B)

Feedwater
Diagnostic Parameters (D)

Parameter
Feedwater Sample
Silica, ppb
Sodium, ppb
Sulfate, ppb
Chloride, ppb
Cation Conductivity, µmho/cm

STARTUP, HOT STANDBY, AND REACTOR CRITICAL AT <15% REACTOR POWER
(RCS >200°F, <15% REACTOR POWER)

Steam Generator
Control Parameters (D)

Parameter	Frequency	Initiate Action
Steam Generator Sample		
Sodium, ppb	4/day	>100 (B) (E)
Chloride, ppb	4/day	>100 (B) (E)
Sulfate, ppb	4/day	>100 (B) (E)
Cation Conductivity, µmho/cm (calculated)	4/day	>2.0 (B) (E)

Steam Generator
Diagnostic Parameters

pH	Should be consistent with or higher than feedwater pH
Hydrazine, ppb	For trending to assess oxidant controls

STARTUP, HOT STANDBY, AND REACTOR CRITICAL AT <15% REACTOR POWER
(RCS >200°F, <15% REACTOR POWER)

(A) pH should be ≥8.8, but morpholine should not be greater than 75 ppm for an extended period of time.

(B) Return to normal value within 8 hours or consider a startup/power hold. An out of spec condition should be documented on form 1000.042A for any out of spec condition, but power hold only applies when reactor power is >2%. The 8 hour time clock for a power hold starts when reactor power is >2%.

(C) Oxygen concentration measured at condensate pump discharge.

(D) Since the OTSG is operating as a recirculating steam generator at power <15%, control and assessment of impurity ingress is based on OTSG blowdown impurity concentrations.

(E) If during power escalation (>2% to 15% power), sodium concentration is >250 ppb or calculated cation conductivity is >4.0 µmho/cm, be in hot shutdown within 4 hours and cleanup by feed and bleed or drain and refill as appropriate. Calculated cation conductivity may exceed 2 µmho/cm if chloride and sulfate are each <100 ppb.

ATTACHMENT 3 Page 1 of 3

POWER OPERATION (≥15% REACTOR POWER)

Feedwater
Control Parameters

Parameter	Frequency (A)	Action Levels 1	2	3
Final Feedwater Sample				
Morpholine, ppm	Daily	(B)		
Hydrazine, ppb	Daily	≤8 x CPD[02] 20 ppb minimum		
Sodium, ppb	Continuous (C)	1	3	5
Chloride, ppb	Daily (C)	3	5	10
Sulfate, ppb	Daily	1	3	5
Silica, ppb	weekly	10	20	
Total Iron, ppb	Weekly (D)	5		
Oxygen, ppb	Continuous (E)	5	10	

Feedwater
Diagnostic Parameters

pH (B)

Cation Conductivity

Fluoride

Copper (F)

Lead

Magnetite Fraction - Analysis is done offsite

Integrated Exposure - Assessment of relative mass of contaminants transported to the steam generators.

POWER OPERATION (≥15% REACTOR POWER)

Parameter	Frequency	Initiate Action		
			Action Levels	
		1	2	3
Condensate Pump Discharge Sample (G)				
Diagnostic Parameter				
Dissolved Oxygen, ppb	Continuous	>25		
Control Parameter				
Dissolved Oxygen, ppb	Continuous	>10	>30 (H)	

Moisture Separator Drain Samples

Diagnostic Parameters

Sodium, ppb

Chloride, ppb

Sulfate, ppb

Cation Conductivity, µmho/cm

POWER OPERATION (≥15% REACTOR POWER)

(A) No planned maintenance should be allowed that will result in a loss of sample cooling (which would prevent meeting sample frequencies in the procedure) for more than four hours. During the maintenance period, a grab sample should be collected hourly of the condensate pump discharge for sodium, pH and oxygen analysis. If one train of feedwater is available, the hourly condensate samples are not necessary. Maintenance requiring the system to be down for more than four hours should be scheduled to be performed during outages.

If unexpected conditions require the system to be unavailable for more than four hours, alternate cooling water should be obtained (temporary modification or procedurally allowed jumper). Grab samples may be taken from the corrosion product samplers or other final feedwater location, if cooling is available, to satisfy the sampling requirements.

(B) pH should be ≥8.8, but not more than 75 ppm morpholine for extended periods of time.

(C) Final feedwater concentrations can 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.

(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.

(F) Copper analysis is used to trend and establish a baseline value.

(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.

ATTACHMENT 4

COLD SHUTDOWN/WET LAYUP CORRECTIVE ACTIONS

Steam Generator Sample

Parameter Out of Range	Corrective Action
pH	1. IF low, THEN add ammonia to correct and mix contents of steam generator. 2. Crosscheck with ammonia/hydrazine/specific conductivity values for consistency.
Sodium/Chloride/Sulfate	1. Feed and bleed until within range or drain and refill with deoxygenated makeup water of proper purity. 2. Check makeup water purity.
Hydrazine	1. IF low, THEN add hydrazine until within range.

ATTACHMENT 5

STARTUP, HOT STANDBY, AND REACTOR CRITICAL AT <15% REACTOR POWER CORRECTIVE ACTIONS

Feedwater Sample

Parameter Out of Range	Corrective Action
pH	1. IF too low, THEN increase morpholine or hydrazine feed. 2. IF pH is high, THEN perform one or both of the following: a. Blowdown and add deionized, deoxygenated makeup water. b. Decrease morpholine or hydrazine feed.
Dissolved Oxygen	1. Check for decreasing vacuum. 2. Check hydrazine residual and add if required. 3. Check dissolved oxygen in makeup water.
Morpholine/Hydrazine	1. Adjust chemical addition.
Suspended Solids	1. Verify pH and amine concentrations are within site specific ranges. 2. Check condensate polisher performance/alignment.

Steam Generator Sample

Parameter Out of Range	Corrective Action
Sodium/Chloride/ Sulfate/Cation Conductivity	1. Drain and fill; add demineralized, deoxygenated makeup water. 2. Check effluent of condensate polishers and make appropriate changes. 3. Verify absence of condenser inleakage. 4. Check makeup water/feedwater purity. 5. IF corrective actions do not alleviate the condition, THEN consider cooldown, drain, and refill.

ATTACHMENT 6 Page 1 of 2

POWER OPERATION (≥15% REACTOR POWER) CORRECTIVE ACTIONS

Final Feedwater Sample

Parameter Out of Range	Corrective Action
pH	1. Verify correct hydrazine feed. 2. Verify correct morpholine feed. 3. Verify absence of regenerant chemical inleakage.
Morpholine/Hydrazine	1. Adjust chemical addition.
Dissolved Oxygen	1. Check hydrazine residual; adjust to ≥8 x CPD[O_2]. 2. Identify and reduce sources of air inleakage. 3. Check for decreasing condenser vacuum.
Chloride/Silica/ Sodium/Sulfate	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	1. Assure morpholine, pH and oxygen are in specification. 2. Increase pH/morpholine to maximum value allowed within control range.

POWER OPERATION (≥15% REACTOR POWER) CORRECTIVE ACTIONS

Condensate Pump Discharge Sample

Parameter Out of Range	Corrective Action
Dissolved Oxygen	1. Identify and reduce air inleakage sources. 2. Test other available locations in feedwater train for dissolved oxygen. 3. Check for decreasing condenser vacuum. 4. Evaluate condenser oxygen removal efficiency.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-SRO-TALT2

UNIT: 1 REV # 0 DATE: _____

TUOI NUMBER: A1JPM-SRO-TALT2

SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – EQUIPMENT CONTROL

TASK: QUARTERLY CHECK OF TEMPORARY ALTERATIONS

JTA#: ANO-SRO-ADMIN-NORM-89

KA VALUE RO: 2.8 SRO: 3.4 KA REFERENCE: 2.2.11

APPROVED FOR ADMINISTRATION TO: RO:_____ SRO: X

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

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: PERFORM SIMULATOR:_____ LAB:_____

POSITION EVALUATED: RO:_____ SRO:_____

ACTUAL TESTING ENVIRONMENT: SIMULATOR:_____ PLANT SITE:_____ LAB:_____

TESTING METHOD: SIMULATE:_____ PERFORM:_____

APPROXIMATE COMPLETION TIME IN MINUTES: 20 MINUTES

REFERENCE(S): 1000.028 Chg. 024-00-0

_____

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: _____

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: The plant is in Mode 3 for turbine repairs. All Temporary Alterations tags are in place.

TASK STANDARD: The examinee has reviewed the attached temporary alteration and identified at least 2 administrative errors.

TASK PERFORMANCE AIDS: Temporary Alteration with 3 errors.

INITIATING CUE:

The Shift Manager directs you to conduct a Quarterly Review of Temporary Alteration 03-1-009 per 1000.028. You have in hand the package as found in the Control Room file. Identify at least 2 administrative errors.

CRITICAL ELEMENTS (C) 2

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Review Temporary Alteration Package 03-1-009.	Examinee reviewed Temporary Alteration Package 03-1-009.			
(C)	2. Identify administrative errors in Temporary Alteration Package 03-1-009.	Examinee identified at least 2 of 3 errors on Temporary Alteration Package 03-1-009: • Improper mode (only Mode 1 checked, all modes should be checked) • Installation authorization not signed • 1000.028E Integrated Drawing list is missing does not agree with 1000.028G, Affected Drawing list in TAP. E-13 sh. 1 and E-111 sh. 3 are not on 1000.028E.			

END

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

The plant is in Mode 3 for turbine repairs.
All Temporary Alterations tags are in place.

INITIATING CUE:

The Shift Manager directs you to conduct a Quarterly Review of Temporary Alteration 03-1-009 per 1000.028. You have in hand the package as found in the Control Room file. Identify at least 2 administrative errors.

ARKANSAS NUCLEAR ONE

E-DOC TITLE: TEMPORARY ALTERATION FORM	E-DOC NO. 1000.028-A	CHANGE NO. 026-00-0

TAP #: 03-1-009 TAP Installation WO# 00033175 TAP Removal WR/WO# WR #00014536

TAP ER # ER-ANO-2003-0906-00~~0~~ 1 3 RLO 11/24/03 12/5/03

TITLE: 'C' Phase Main Transformer Removal

ANO-1 ☒ ANO-2 ☐ ANO- Common ☐ Q ☐ F ☐ S ☐ N ☒ C ☐

If both units are affected, mark common.
Unit responsible for the affected SSC, as defined in the Component Data Base, will number and control the TAP.

Affected SSC: X-01(A,B,C&S), TE-9038, TE-9039, C482, A UD716, UD717, UD718, UD719, UD720, UD721, UD722, UD

Associated SSC:

Reason for Installation:

Due to current plant conditions, removal of the degraded C-Phase Main Transformer has been requested to support the future installation of the replaced transformer.

Plant Modes for which TAP may remain installed: **(mark all which apply):**

Modes
- ☒ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6

(P-14480) Justification for TAP and its expected Duration:

3 RLO 11/24/03, 12/5/03

ER-ANO-2003-0906-00~~0~~ evaluates this T-Alt. This T-Alt should be installed with the removal of the C-Phase Main Transformer and removed during ~~during~~ EC# 12-03 an outage of sufficient duration.

APPROVALS

		Date:
Installation Engineer:		11/05/03
Independent Reviewer:		11/26/03
Supervisor:	Thomas Eric Allen	11/26/03
Manager:		11/26/03
System Engineer:		11/05/03
System Engr Manager:		11/26/03
Operations Manager:		11/26/03
OSRC Chairman:	N/A	N/A
Plant Manager:		11-26-03

Clerk: Contact Installation Engineer when Plant Manager approval has been granted.

INSTALLATION AUTHORIZATION

SM / CRS: _____ Date: _____

REMOVAL AUTHORIZATION

SM / CRS: _____ Date: _____

ARKANSAS NUCLEAR ONE		
DOC TITLE: TEMPORARY ALTERATION FORM	E-DOC NO. 1000.028-A	CHANGE NO. 026-00-0

TAP Serial No. 03-1-009
Page: 2

LIST OF EFFECTIVE PAGES

DESCRIPTION		PAGES	LATEST REVISION NUMBER FOR PAGE(S)
Description and Approvals		1	~~0~~ ~~1~~ 3
List of Effective Pages		2	~~0~~ ~~1~~ ~~2~~ 3
Summary Description		3	~~0~~ ~~1~~ 3
Verification and Documentation of Installation		4	0
Verification and Documentation of Removal		5	0
Affected Drawing List	E-Doc No. 1000.028-G	6	0 1
Temp Alt Tag Record Sht	E-Doc No. 1000.028-B	7	~~0~~ 1
TAP Revision	E-Doc No. 1000.028-D	8	0
TAP Revision	E-Doc No. 1000.028-D	9 ~~10~~ 10	~~0~~ 2 ~~2~~ 3
TAP Revision	E-Doc No. 1000.028-D	11	3
Attachment 1 – ER-ANO-2003-0906-~~00~~ ~~2~~ 3		All	~~0~~ ~~1~~ 3

(Additional sheets must be numbered and include the TAP serial number)

ARKANSAS NUCLEAR ONE		
E-DOC TITLE: TEMPORARY ALTERATION FORM	E-DOC NO. 1000.028-A	CHANGE NO. 026-00-0

TAP Serial No. 03-1-009
Page: 3

Summary Description of temporary alteration:

This T-Alt will provide the necessary instructions to support the temporary removal of the original Unit-1 C-Phase Main Transformer (X-01C).

Special Instruction:

31 The installation engineer (or designee) shall verify that the requirements of ER-ANO-2003-0906-00023 have been implemented in the installation work order (WO# 00033175 Task #4). If certain steps, or work instructions, have been previously performed, visually verify the completeness of the work and attach a copy of supporting documentation to the installation work order.
Verification Signature: [signature] 12/5/03

Verify that a copy of the completed portion of the installation work order has been attached to this Temporary Alternation after installation.
Verification Signature: [signature] 12/5/03

31 Verify that post-Installation testing of the generator lockout functions have been performed during functional testing of X-01S under WR# 0014282 in addition to the continuity check described in ER-ANO-2003-0906-00023. Attach a copy of the test results (or a similar document) to this T-Alt.
Verification Signature: [signature] WOI-00033517 Task 01

Verify installation of the bushing boxes / damper assemblies' structural support under WR# 00014479 and Isophase Bus Duct Blanks (Covers) for conduit openings per WR# 00014477. (Testing to verify proper flow balance and capability of the Isophase bus cooling will be tested in conjunction with the test performed by the X-01B and X-01S Isophase bus testing; reference ER-ANO-2003-0893-001 and will verify that the Isophase Bus Duct Blanks have an adequate seal.)
Verification Signature: [signature] 12/5/03 * Visually confirmed covers + bushing support * installed.

31 Removal of this T-Alt will be covered in a separate WO (presently WR# 00014536) iaw linked ER-ANO-2003-906-001. (See ER-ANO-2003-0906-00023 Section 5.2) The removal instructions will depend on the transformer model that will be installed as a replacement for X-01C. The Installation Engineer (or designee) must verify that the removal WO and supporting ER appropriately address all facets of the TAP and attach the supporting documentation (including the WO and ER) to this Temporary Alteration prior to removal.
Verification Signature: _____

Suggested Temporary Alteration Tag Locations:

Isophase Bus Duct Blanks
Temporary Junction Box for Generator Lockout Circuit wiring installed near/on X-01C concrete pad.

Suggested Caution Cards / Locations

None

(Additional sheets must be numbered and include the TAP serial number)

VERIFICATION AND DOCUMENTATION OF INSTALLATION

NOTE
If partial installation is desired, Form 1000.024E "Provisional Release" shall be complied with. This form shall be filed with the Temporary Alteration Package, with a copy in the Installation WO.

The Installation Engineer or other individual who meets the requirements to be an Installation Engineer verifies that the temporary alteration has been installed per Section 6.11.1.

INSTALLATION ENGINEER: Roger L Dupp Jr DATE: 12/5/03

The Shift Manager or designee verifies that the temporary alteration has been installed per Section 6.11.2.

SHIFT MANAGER/DESIGNEE: David Thyer DATE: 12/6/03

Copies of the Temporary Alteration Package are forwarded to:

a) If OSRC final review has not been obtained, forward original to OSRC promptly and file a copy in the Control Room; otherwise mark N/A.

FORWARDED BY: N/A DATE: N/A

b) Manager, Design Engineering (Affected Drawing List only)

FORWARDED BY: David Thyer DATE: 12/6/03

c) Manager, System Engineering

FORWARDED BY: David Thyer DATE: 12/6/03

d) Control Room of other unit, if affected (otherwise N/A)

FORWARDED BY: N/A DATE: N/A

NOTES
1. The Installation Engineer audit should be completed within 7 days of the installation of the temporary Alteration.
2. It is not necessary to make copies of drawings larger than 8½" x 11".
3. The Tag Record Sheet (Form 1000.028B) and a copy of any Lifted Lead Logs used for this installation shall be filed with the TAP.

The Installation Engineer shall perform an audit of the original Temporary Alteration Package in accordance with Section 6.12.1.

INSTALLATION ENGINEER: Roger L Dupp Jr DATE: 12/19/03

VERIFICATION AND DOCUMENTATION OF REMOVAL

NOTE

If partial removal is desired, Form 1000.024E "Provisional Release" shall be complied with. This form shall be filed with the Temporary Alteration Package, with a copy in the Removal WO.

The Installation Engineer verifies that the temporary alteration has been removed and configuration restored per Section 6.16.2.

INSTALLATION ENGINEER: _____ DATE: _____

The Shift Manager or designee verifies that the temporary alteration has been removed and configuration restored per Section 6.16.4.

SHIFT MANAGER/DESIGNEE: _____ DATE: _____

Copies of this page of the closed-out Temporary Alteration Package are forwarded to:

A. Manager, Design Engineering

FORWARDED BY: _____ DATE: _____

B. Manager, System Engineering

FORWARDED BY: _____ DATE: _____

If other unit was affected, remove their copy (otherwise N/A).

REMOVED BY: _____ DATE: _____

SHIFT MANAGER/DESIGNEE: _____ DATE: _____

Forward original Temporary Alteration Package to Records.

FORWARDED BY: _____ DATE: _____

ARKANSAS NUCLEAR ONE		
E-DOC TITLE: TEMPORARY ALTERATION AFFECTED DRAWING LIST FORM	E-DOC NO. 1000.028-G	CHANGE NO. 025-00-0

TAP Serial No. 03-1-009
Page: 6

AFFECTED DRAWING LIST

1A. The Installation Engineer will list below in Column 1 all Category A & B drawings affected by this Temporary Alteration (if none, enter "none"), and will sign below. If additional space is required, additional copies of this sheet may be attached. Provide sheet numbers in the upper right corner.

1B. The System Engineer will review and concur with the information in Column 1 and will sign below.

2. The Shift Manager will assign an individual to determine whether each listed drawing is filed in the Control Room and to mark Column 2 appropriately.

3. The Shift Manager will assign an individual to list each affected Control Room drawing on the Temporary Alteration Integrated Drawing List and all required copies. As each drawing is listed, the individual will initial the table in Column 3 below ("N/A" if not in Control Room). When all have been listed, he will sign below (even if "none" are listed).

4. When the Temporary Alteration is cleared, the Shift Manager will assign an individual to clear each affected drawing from the Temporary Alteration Integrated Drawing List and all required copies. As each drawing is cleared, Column 4 below will be initialed. When all have been cleared, the individual will sign below.

5. At each quarterly review, the person performing the review will enter the date of the review and initial below the date for each Control Room drawing to indicate that the listed drawing is properly listed on the Temporary Alteration Integrated Drawing List. If additional columns are required, additional copies of this sheet may be attached, with the information in Columns 1 and 2 repeated and Columns 3 and 4 diagonally lined through and marked "N/A". (No review is required if no drawings are listed.)

1. Drawing Number (one sheet per line)	2. Is this drawing in the Control Room?		3. This drawing has been placed on the Integrated List	4. This drawing has been removed from the Integrated List	5. Quarterly Reviewer Initials					
	YES	NO			Date:	2/8/04	5-10-04	7-24-04	11-17-04	1-8-05
E-14, Sh 1 Rev71	☒	☐	DMT		2/8	DMT	CSG	A	CSG	RL
E-13, Sh 1 Rev43	☒	☐	DMT			DMT	CSG	A	CSG	RL
E-111, Sh 1 Rev 9	☒	☐	DMT			DMT	CSG	A	CSG	RL
E-111, Sh 2 Rev 2	☒	☐	DMT			DMT	CSG	A	CSG	RL
E-111, Sh 3 Rev 2	☒	☐	DMT			DMT	CSG	A	CSG	RL
E-452, Sh 4 Rev 6	☒	☐	DMT			DMT	CSG	A	CSG	RL
E-113 Sh 1 Rev 3	☒	☐	DMT			DMT	CSG	A	CSG	RL
E-113 Sh 2 Rev 2	☒	☐	DMT			DMT	CSG	A	CSG	RL
E-471 Sh 15 Rev 4	☒	☐	DMT			DMT	CSG	A	CSG	RL

Affected Category A & B drawings have been listed above:
Roger Rumpf — Installation Engineer — 11/29/03 — Date

Affected Category A & B drawings have been listed above:
Roger Rumpf — System Engineer — 11/29/03 — Date

Affected drawings have been listed on the Integrated Drawing List and all copies:
David Thyson — Assigned Individual — 12/6/03 — Date

Affected drawings have been cleared from the Integrated Drawing List and all copies:
Assigned Individual — Date

(Additional sheets must be numbered and include the TAP serial number)

ARKANSAS NUCLEAR ONE		
E-DOC TITLE: TEMPORARY ALTERATION TAG RECORD SHEET	E-DOC NO. 1000.028-B	CHANGE NO. 024-00-0

TEMPORARY ALTERATION TAG RECORD SHEET

TAP SERIAL NUMBER 03-1-009 Sheet 7

TAG NO.	LOCATION	INSTALLED BY	INSTALLATION ENGINEER'S VERIFICATION	DATE	REMOVED BY	INSTALLATION ENGINEER'S VERIFICATION	DATE
1	Isophase Bus Duct Blanks	* RLO	RLO	12/5/03			
2	Temporary Junction Box for lockout wiring splice to X-01S @ X-01C pad	* RLO	RLO	12/5/03			
3	C-482 Fire Protection Cabinet for X-01C	12/4/03	RLO	12/5/03			

RETURN THIS SHEET AND THE TAP TO CONTROL ROOM AFTER COMPLETION OF VERIFICATION

* Visually confirmed T-Alt tags placed @ appropriate spots

TEMPORARY ALTERATION PACKAGE REVISION (TAPR)

TAP Serial Number: 03-1-009 **TAPR Number:** 1

Changed/Added Pages: 1,2,3,6,7,Attachment 1/ 8

Summary of Changes: INCORPORATED ER-ANO-2003-0906-002. Added wiring changes to address the nuisance alarms caused by the X-01C fire detection disabled detectors which have been removed from service. Provide alternative method for supporting west end of Isophase Bus Bushing Box. Correct WO # typos.

Justification of Changes: Prevents nuisance alarms from distracting Operations personnel and from masking valid common trouble alarms from remaining fire detection system inputs. Provides acceptable method for supporting west end of Isophase Bus Bushing Box.

1. Does this change require a revision to the original 50.59 Review	☒YES ☐NO
2. Does this change allow the Temporary Alteration Package to be applied to a different component, system , structure, or associated OSRC?	☒YES ☐NO
3. Does this change affect the basic function of a system, structure, or component not already addressed by the originally approved temporary alteration?	☒YES ☒NO
4. Does this change affect performance requirements in a manner not already addressed by the originally approved temporary alteration?	☐YES ☒NO
5. Does this change deviate from codes, standards, or regulatory requirements to which the plant is committed, not addressed by the approved Temporary Alteration Package?	☐YES ☒NO

VAB 11/30/03

TAPR APPROVAL

NOTE
A YES response to a screening question requires the approval of Management and OSRC.
IF screening questions are answered NO,
THEN obtain only a Systems Engineering Supervisor approval.

Prepared By: _____ (Installation Engineer) Date 11/29/03

Reviewed By: _____ (Engineer) Date 11/29/03

Supervisor: _____ Date 11/29/03

System Engineer _____ Date 11/29/03

Systems Engineering Manager : Vincent Bond for M. Chisum Date 11/30/03

Operations Manager : _____ Date 11/30/03

OSRC Chairman : _____ Date 12/2/03

Plant Manager : _____ Date 12-2-03

INSTALLATION AUTHORIZATION

SM/CRS : _____ Date 12/3/03

(additional sheets must be numbered and must include the TAP serial number)

TEMPORARY ALTERATION PACKAGE REVISION (TAPR)

TAP Serial Number: 03-1-009 **TAPR Number:** 2

Changed/Added Pages: added pages 9 and 10

Summary of Changes: Description of jumper (shown on marked-up drawings E-113 Sh2 rev 2 and E-471 Sh15 Rev 4) added along with cable numbers and colors.

Justification of Changes: Clarification of details already present.

1. Does this change require a revision to the original 50.59 Review	☐YES ☒NO
2. Does this change allow the Temporary Alteration Package to be applied to a different component, system , structure, or associated OSRC?	☐YES ☒NO
3. Does this change affect the basic function of a system, structure, or component not already addressed by the originally approved temporary alteration?	☐YES ☒NO
4. Does this change affect performance requirements in a manner not already addressed by the originally approved temporary alteration?	☐YES ☒NO
5. Does this change deviate from codes, standards, or regulatory requirements to which the plant is committed, not addressed by the approved Temporary Alteration Package?	☐YES ☒NO

TAPR APPROVAL

NOTE

A YES response to a screening question requires the approval of Management and OSRC.

IF screening questions are answered NO,
THEN obtain only a Systems Engineering Supervisor approval.

Prepared By: Roger L. Owings Jr. / Roger L Owings Jr (Installation Engineer) Date 12/4/2003

Reviewed By: Chris Shively / Chris Shively (Engineer) Date 12/4/2003

Supervisor: Vince Bond / Vincent Bond Date 12/4/2003

System Engineer N/A Date

Systems Engineering Manager : N/A Date

Operations Manager : N/A Date

OSRC Chairman : N/A Date

Plant Manager : N/A Date

INSTALLATION AUTHORIZATION

SM/CRS: [signature] Date 12/4/03

(additional sheets must be numbered and must include the TAP serial number)

The following detailed steps are for additional clarification of information already contained in the supporting ER for this T-Alt.

Per connection drawing E-113 Sheet 2 and E-471 Sheet 15, in C482:

- ✓ lift wire at terminal 8E (Cable # U34DB Color: OR-BK)
- ✓ jumper 2E to 8E 12/4/03
- ✓ lift wire at terminal 9E (Cable # U34A5 Color: ~~GR-BL~~) GR BK 12/4/03
- ✓ jumper 9E to 6E2 "alarm" in 12/4/03
- ✓ lift wire at terminal 6E2 (Cable # U34DB Color: BK)
- ✓ jumper 3E to 5E2

3 This information has been incorporated into ER-ANO-2003-000906-003 and is being retained strictly for historical purposes. Will be scanned with T-Alt package for IDEAS

TEMPORARY ALTERATION PACKAGE REVISION (TAPR)

TAP Serial Number: 03-1-009 1,2 & 10 2L0 12/5/03 **TAPR Number:** 3

Changed/Added Pages: Changed Pages 3 and Attachment 1 from ER-ANO-2003-0906-002 to ER-ANO-2003-0906-003

Summary of Changes: ER-ANO-2003-0906-003 added to correct instruction for fire detection bypass wiring and added the bypass of the Operating Relay to prevent inadvertent actuation. Enhancements from TAP 03-1-009 TAPR 2 incorporated into ER for completeness.

Justification of Changes: E-113 Sh2 Rev 2 contained drafting errors not detectable until attempted installation (reference CR-1-2003-1212). Changes necessary to meet scope.

1. Does this change require a revision to the original 50.59 Review	☐YES ☒NO
2. Does this change allow the Temporary Alteration Package to be applied to a different component, system , structure, or associated OSRC?	☐YES ☒NO
3. Does this change affect the basic function of a system, structure, or component not already addressed by the originally approved temporary alteration?	☐YES ☒NO
4. Does this change affect performance requirements in a manner not already addressed by the originally approved temporary alteration?	☐YES ☒NO
5. Does this change deviate from codes, standards, or regulatory requirements to which the plant is committed, not addressed by the approved Temporary Alteration Package?	☐YES ☒NO

TAPR APPROVAL

NOTE

A YES response to a screening question requires the approval of Management and OSRC.

IF screening questions are answered NO,
THEN obtain only a Systems Engineering Supervisor approval.

Prepared By: _____ (Installation Engineer) Date 12/5/03

Reviewed By: _____ (Engineer) Date 12/5/03

Supervisor: Rhonda Eric Allen Date 12/5/03

System Engineer SEE PREPARED BY / INSTALLATION ENGR Date _____

Systems Engineering Manager : N/A Date _____

Operations Manager : N/A Date _____

OSRC Chairman : N/A Date _____

Plant Manager : N/A Date _____

INSTALLATION AUTHORIZATION

SM/CRS : _____ Date 12-5-03

(additional sheets must be numbered and must include the TAP serial number)

ER COVER SHEET

TAP-03-1-009
ATTACHMENT 1

ER #: ER-ANO-2003-0906-003	Revision #: 0	Grade: N.0.R.80	Page 1 of 1

Title: Removal of Original C-Phase Main Transformer - (will superscede ER-ANO-2003-0906-002)

ORIGINATING DEPARTMENT

Originator: Allen,Rhouis E	Date: 12/4/2003	Ext: 5018584527	Dept:

System ID:

Equipment ID:

Date Required:

Sugg. Milestone:_____

Problem/Proposed Solution/Justification: (Attach additional sheets as required)

This ER will provide the engineering bases for T-Alt 03-1-009. Cannot revise ER-ANO-2003-0906-002 and as a result this ER was initiated to superscede the original ER. [Note that ER-ANO-2003-0906-002 superceded ER-ANO-2003-0906-000. ER was initiated to superscede the original ER.

This revision is necessary as a result of a drawing error on E113-2 (ref CR-1-03-1212).

CLASSIFICATION AND ENGINEERING RESPONSE

Quality Classification: Non Safety

Implementation:

Response Type: Evaluation

Problem Resolution: (Attach additional sheets as required)

See Attached

LBD Impacted ☐ YES ☒ NO

Responsible Engineer: Mehta,Niranjan K **Date:** 12/4/2003

REVIEW

☒ **Technical Reviewer** Owings,Roger Lacey **Date:** 12/5/2003

☐ **Design Verifier** **Date:**

APPROVAL

☒ **Supervisor** Allen,Rhouis E **Date:** 12/5/2003

☐ **Engineering Manager** **Date:**

☐ **PSRC Required** **PSRC Meeting Number:** **Date:**

☐ **GMPO** **Date:**

ER: ER-ANO-2003-0906-003 Revison: 0	Engineering Request Review Results

Title: Removal of Original C-Phase Main Transformer - (will superscede ER-ANO-2003-0906-002)

REVIEWS

Assigned To	Review Type	Name and Date		
COMPUTER SUPPORT GROUP	Package	Mehta,Niranjan K	via telecon for Canitz,Kenneth V	12/04/2003
TIGER TEAM	Package	Mehta,Niranjan K	via telecon for Saulsberry,Daryll	12/04/2003
TIGER TEAM	Package	Mehta,Niranjan K	via telecon for Saulsberry,Daryll	12/05/2003
UNIT 1 OPERATIONS STANDARDS	Package	Mehta,Niranjan K	via telecon for Taylor,James T	12/04/2003
COMPUTER SUPPORT GROUP	Final Team	Mehta,Niranjan K	via telecon for Taylor,James T	12/05/2003
UNIT 1 OPERATIONS STANDARDS	Final Team	Mehta,Niranjan K	via telecon for Canitz,Kenneth V	12/05/2003

TEMPORARY ALTERATION INTEGRATED DRAWING LIST

TAP NUMBER	DRAWINGS AFFECTED	DATE INSTALLED	DATE REMOVED
03-1-009	E-14-1, E-111-1,2, E-452-4, E-113-1,2, E-471-15	12/5/03	
04-1-007	M-230 Sh. 2	5/10/04	
04-1-002	E-71 Sh. 14	5/11/04	
OP-1104.032 Att. E	M-209 Sh. 4 M-219 Sh. 1	3/3/05	

Maintain original in the Temporary Alteration file.

Distribute copies to: Control Room
Control Room Extension
Auxiliary Operator Shack (Unit 1 only)
WCO Office (Unit 1 Only)

NOTE: all other copies shall be stamped "Uncontrolled Copy" or words to that effect

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: CONTROL OF TEMPORARY ALTERATIONS SET #	DOCUMENT NO. 1000.028	CHANGE NO. 024-00-0
	WORK PLAN EXP. DATE N/A	TC EXP. DATE N/A
	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**Effective Communication**
Distraction/Interruption	**Questioning Attitude**
Multiple Tasks	**Placekeeping**
Overconfidence	**Self Check**
Vague or Interpretive Guidance	**Peer Check**
First Shift/Last Shift	**Knowledge**
Peer Pressure	**Procedures**
Change/Off Normal	**Job Briefing**
Physical Environment	**Coaching**
Mental Stress (Home or Work)	**Turnover**

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	**1000.006A**	**050-00-0**

E. Copies of the Temporary Alteration Package are forwarded to:

1. IF OSRC final review is required and has not been obtained,
THEN forward original to OSRC promptly and file a copy in the Control Room.

2. Manager, Design Engineering (Affected Document List only).

3. Manager, System Engineering.

4. Control Room of other unit, if affected.

F. Document the verification by signing and dating the appropriate blocks on the Temporary Alteration Package, Form 1000.028A.

6.11.3 The SM/CRS shall ensure that the original Temporary Alteration Package is kept under the control of the respective Control Room after final OSRC approval is obtained.

6.11.4 Upon receipt of the post-installation copy of a Temporary Alteration Integrated Drawing List, the Manager, Design Engineering, shall ensure that drawings listed are identified in a site-wide manner such that persons using controlled copies of the drawings outside the Control Room may become aware of the existence of the Temporary Alterations.

6.12 AUDIT OF A TEMPORARY ALTERATION PACKAGE

6.12.1 Upon receipt of the post-installation copy of a Temporary Alteration Package, the Manager, System Engineering shall direct the Installation Engineer, or some other person who meets the requirements to be an Installation Engineer, to audit the original Temporary Alteration Package. This audit should be completed within 7 days of the installation of the Temporary Alteration Package.

6.13 PERIODIC REVIEW OF AN INSTALLED TEMPORARY ALTERATION

6.13.1 Control Room personnel should maintain cognizance of the temporary alteration log to ensure that they are aware of installed temporary alterations.

6.13.2 The Operations Manager for the affected unit shall ensure that the following checks are performed for each installed temporary alteration. Those temporary alterations which affect both units shall be checked by the unit which holds the original Temporary Alteration Package.

(P-7993, P-11247)

A. Operations Quarterly checks:

1. Verify the alteration need is still temporary.

2. Mode requirements are properly met.

3. TA Tags are in place in accordance with the TA Tag Record Sheet (Form 1000.028B).

4. The Integrated Drawing List (Form 1000.028E) properly lists the drawings on the Affected Drawing List for each TAP. This will be indicated by initialing the Affected Drawing List in the appropriate blank.

5. The original TAP is complete and on file in the responsible Control Room.

6.13.3 The Operations Manager shall forward reports of these reviews to the System Engineering Manager.

(P-7993) 6.13.4 Prior to startup following a scheduled outage or a change in operating mode, the operations manager shall review installed temporary alterations to ensure that no temporary alterations are required to be removed and that **the installed temporary alterations are still required.**

6.13.5 The System Engineering Manager should ensure a physical check of accessible portions of Temporary Alterations is made quarterly, concurrent with the normal System Engineering walkdowns. The check should include verification of the following:

A. The temporary alteration is installed properly.

B. The temporary alteration is in good materiel condition.

C. The checks will note any problems and actions taken to maintain the temporary alteration. Temporary instrumentation will be checked to verify that required calibrations are current and will remain current until next quarterly review. The System Engineering Manager shall ensure that appropriate actions are taken to resolve the concerns.

D. Action has been initiated to eliminate the need for the Temporary Alteration.

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 0 Date: 3/15/2005

TUOI NUMBER: A1JPM-SRO-RC22

System/Duty Area: Administrative Topic-Radiation Control

Task: Calculate Stay times for yourself and another operator

JA# ANO-SRO-ADMIN-NORM-162

KA Value RO 2.6 SRO 3.3 KA Reference G 2.3.10

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: _____ Plant Site: _____ Lab _____

Testing Method: Simulate: _____ Perform: _____

Approximate Completion Time In Minutes: 20 Minutes

Reference(S): HP Survey Map of P36C, Pump Room 54.

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:

You are an operator with the plant at full power. A hot spot has developed on Makeup PUMP P36C. You and another operator will be working in the vicinity of the reduction gear assembly in order to flush the lines and reduce the hot spot radiation field.

Using the supplied survey map, determine the individual stay times **for yourself AND the other operator** without exceeding the annual administrative dose limit (Ignore dose received during transit). You have an accumulated annual Whole Body dose of 1750 mR (ANO records). The other operator has an accumulated annual Whole Body dose of 1650 mR (ANO records). No additional dose has been received at any other site.

Also, calculate stay times if the air in the pump room was contaminated with a level of 0.40 DAC (stochastic) assuming no respirators are used.

Calculations should be based on ANO Unit 1 Administrative dose limits. **Provide answers with 3 significant figures (example 4.51 hours).** Do not consider ALARA task requirements. Any required dose extensions have been processed and approved.

TASK STANDARD:

The examinee has correctly determined the stay times for himself and the other operator on the assignment.

TASK PERFORMANCE AIDS:

HP Survey map of P36C Pump Room, Room number 54.

SIMULATOR SETUP:

N/A

INITIATING CUE: Determine the Stay time for you and the other operator on the job. Also determine the stay time if the air in the pump room was contaminated with a level of 0.40 DAC (stochastic) assuming no respirators are used. **Provide answers with 3 significant figures (example X.XX hours).**

CRITICAL ELEMENTS (c): 1,2, and 3

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
C	1. Determine the HIGHEST general area dose rate in the area of the reduction gear assembly to be used from the survey map.	Examinee has determined the HIGHEST general area dose rate in the area of the reduction gear assembly to be used from the survey map of P36C pump room. (75 mR/hr)	____	____	___
C	2. Determine Stay time (to 3 significant figures) with no airborne contamination for both operators. **Key**: Max dose at ANO1 is 2000 mR OP1 has 1750mR, =>allowed dose 250mR OP2 has 1650mR, =>allowed dose 350mR 250mR / 75mR/hr = 3.33 hr, 350mR / 75mR/hr = 4.67 hr	Examinee has determined that the stay time for him/her is 3.33 hrs and the stay time for the other operator is 4.67 hrs plus or minus 0.01 hours.	____	____	___
C	3. Determine Stay time(to 3 significant figures) WITH airborne contamination for both operators. 1DAC = 2.5mR/hr => 0.40DAC =>1.0mR/hr Total rate = 75mR/hr + 1.0mR/hr = 76mR/hr 250mR / 76mR/hr = 3.29 hr 350mR / 76mR/hr = 4.61 hr	Examinee has determined that the stay time for him/her is 3.29hrs and the stay time for the other AO is 4.61 hrs plus or minus 0.01 hours.	____	____	___
EXAMINER'S CUE: This concludes the JPM.					

END

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are an operator with the plant at full power. A hot spot has developed on Makeup PUMP P36C. You and another operator will be working in the vicinity of the reduction gear assembly in order to flush the lines and reduce the hot spot radiation field.

Using the supplied survey map, determine the individual stay times and another operator without exceeding the annual administrative dose limit (Ignore dose received during transit). You have an accumulated annual Whole Body dose of 1750 mR (ANO records). The other operator has an accumulated annual Whole Body dose of 1650 mR (ANO records). No additional dose has been received at any other site.

Also calculate stay times if the air in the pump room was contaminated with a level of 0.40 DAC (stochastic) assuming no respirators are used.

1 DAC = 1 ALI

1 ALI is assumed to accumulate over 2000 hrs

1 ALI = 5000 mR

Calculations should be based on ANO Unit 1 Administrative dose limits. **Provide answers with 3 significant figures (example X.XX hours).** Do not consider ALARA task requirements. Any required dose extensions have been processed and approved.

See handout for definitions.

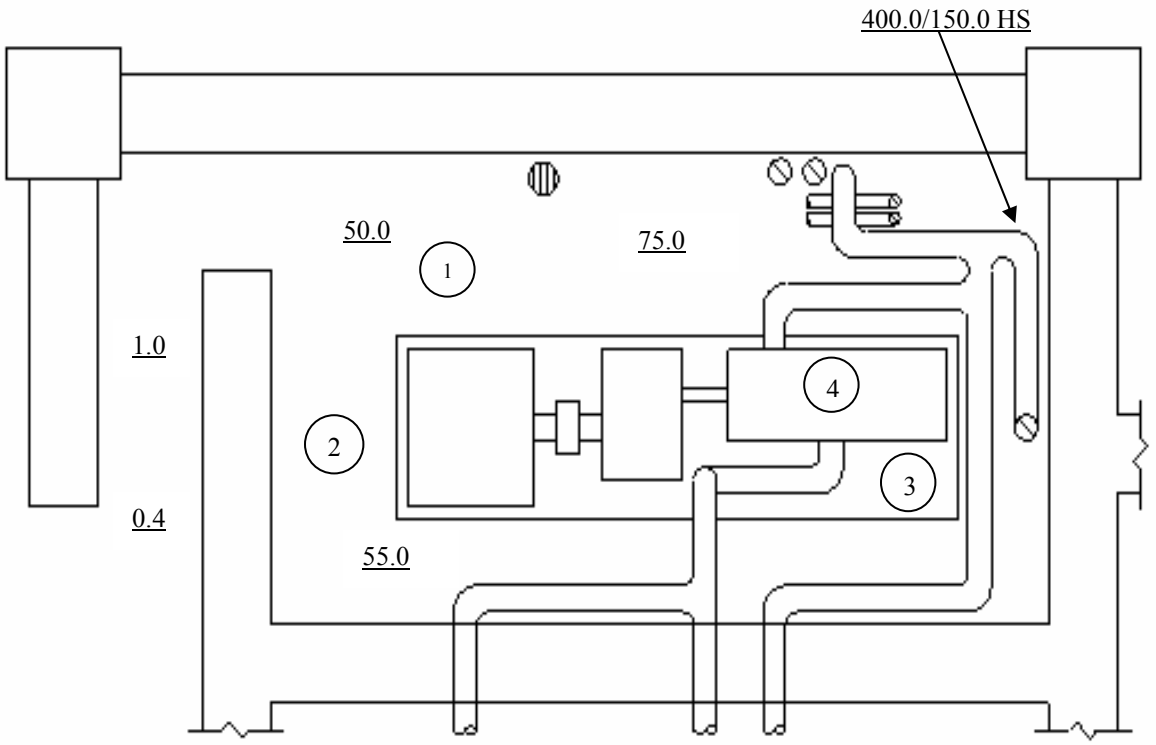
INITIATING CUE:

Determine the Stay time for you and the other operator on the job. Also determine stay time if the air in the pump room was contaminated with a level of 0.40 DAC (stochastic) assuming no respirators are used. **Provide answers with 3 significant figures (example X.XX hours).**

MAP NUMBER: 1A2-16 LOCATION: U1 AUX 335' EL. P36C PUMP ROOM, ROOM NUMBER 54

Aux building
posted: RM,RWPR

335 posted RA



All Radiation values are in mrem/hour unless otherwise noted.
12.5 denotes gamma general area dose rates.
Smear contamination values are in DPM/100 Sqcm unless otherwise noted.
H. S. Denotes Hot Spot Readings
*12/13 Denotes Gamma Contact/Far reading (30 cm)
O Denotes smear location (100 sqcm.)
* 12 Denotes contact dose rate (gamma) *12 B Denotes Beta Contact Dose Rate
□ Denotes large area smear location
Form to be retained for records

Smear Data

DPM/ 100cm2

No.	Activity
1	20,000
2	30,000
3	60,000
4	10,000

Alpha Smears
DPM/100cm2

No.	Activity

Rx. % 100
Date 09/01/2005
Time 0000:00

Dose Rate Inst. HP-DR-170
Cal Due Date 12/31/2005
Dose Rate Inst. #2 RM-065
Cal Due Date 12/31/2005
Count Inst. RO-705
Cal Due Date 12/31/2005
Bkg. 80 cpm D/C 10
Count Inst. #2 RO-708
Cal Due Date 12/31/2005
Bkg. 90 cpm D/C 10

Survey Frequency:
_____ Daily
_____ Bi-Weekly
__X__ Monthly
_____ Quarterly
_____ Job Coverage
_____ Other

RWP # 4005/1

Surveyor:
John Public 1234
Badge

RP Supervisor Review:

Imma N. Charge

DANI # 011256

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-SRO-EAL9

UNIT: 1 REV # 0 DATE: _____

TUOI NUMBER: A1JPM-SRO-EAL9

SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – EMERGENCY PROCEDURES/PLAN

TASK: TAKE EMERGENCY DIRECTION AND CONTROL

JTA#: ANO-SM-EPLAN-EMERG-302

KA VALUE RO: 2.6 SRO: 4.0 KA REFERENCE: 2.4.29

APPROVED FOR ADMINISTRATION TO: RO: _____ SRO: X

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

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: PERFORM LAB: _____

POSITION EVALUATED: RO: N/A SRO: X

ACTUAL TESTING ENVIRONMENT: SIMULATOR: X PLANT SITE: _____ LAB: _____

TESTING METHOD: SIMULATE: _____ PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 MINUTES

REFERENCE(S): 1903.010 Chg. 037-03-0, 1903.011, Chg. 028-00-0

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: _____

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: The following conditions exist:

Unit One reactor has tripped one hour ago. Reactor Building radiation levels are reading 190 R/hr. RP reports radiation levels are 2000 mR/hr from sample point SA-229. RB Sump level on L-1405 is steady at 60%. Aux. Bldg. Sump level on L-4403 is rising. Dirty Waste Drain Tank T-20A/B levels are going up. SE calculates an RCS leak rate of 60 gpm. RDACS is indicating an offsite release is in progress.

TASK STANDARD: Examinee correctly classifies this event as a GE per EAL 1.7 and makes notifications to plant personnel per step 4 of 1903.011S.

TASK PERFORMANCE AIDS: 1903.010 Attachments 1 and 3, and 1903.011

INITIATING CUE:

For the given plant conditions, determine the applicable EAL classification and initiate notifications through step 4 of the applicable Shift Manager checklist in 1903.011.

CRITICAL ELEMENTS (C) 3, 5

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	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 a GE based on EAL 1.7, Loss of or challenge to all three fission product barriers (not required to be stated).	_____	_____	_____
	4. Initiate immediate notifications.	Referred to 1903.011.	_____	_____	_____
NOTE: Cue the examinee that the Unit 2 Shift Engineer is performing the initial notifications per 1903.011 after the examinee has stated that Unit 2 Shift Engineer (or control room communicator) has been requested.					
(C)	5. Begin completion of form 1903.011S, GE Emergency Direction and Control Checklist for Shift Manager.	Began completion of form 1903.011S GE Emergency Direction and Control Checklist for Shift Manager. Examinee should fill in the data on items 1 and 2. Examinee should simulate (or state) direction of the SE to complete the initial notification.	_____	_____	_____
	6. Inform Control Room Staff of Emergency Class declaration.	Informed Control Room Staff of GE.	_____	_____	_____

END

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

- Unit One reactor has tripped one hour ago.
- Reactor Building radiation levels are reading 190 R/hr.
- RP reports radiation levels are 2000 mR/hr from sample point SA-229.
- RB Sump level on L-1405 is steady at 60%.
- Aux. Bldg. Sump level on L-4403 is rising.
- Dirty Waste Drain Tank T-20A/B levels are going up.
- SE calculates an RCS leak rate of 60 gpm.
- RDACS is indicating an offsite release is in progress.

INITIATING CUE:

For the given plant conditions, determine the applicable EAL classification and initiate notifications through step 4 of the applicable Shift Manager checklist in 1903.011.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: EMERGENCY ACTION LEVEL CLASSIFICATION SET #	DOCUMENT NO. 1903.010	CHANGE NO. 037-03-0
	WORK PLAN EXP. DATE N/A	TC EXP. DATE N/A
	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**Effective Communication**
Distraction/Interruption	**Questioning Attitude**
Multiple Tasks	**Placekeeping**
Overconfidence	**Self Check**
Vague or Interpretive Guidance	**Peer Check**
First Shift/Last Shift	**Knowledge**
Peer Pressure	**Procedures**
Change/Off Normal	**Job Briefing**
Physical Environment	**Coaching**
Mental Stress (Home or Work)	**Turnover**

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	**1000.006A**	**050-00-0**

ATTACHMENT 3
UNIT 1
PRIMARY SYSTEM EVENTS

1.7

CONDITION:

Loss of or challenge to all 3 Fission Product Barriers

EMERGENCY CLASSIFICATION:

General Emergency

MODES All

CRITERIA:

1. Either of the following conditions exist:

   A. Fuel Cladding Failure (refer to section 4.10.1)
   B. Challenge to Fuel Cladding (refer to section 4.11.1)

AND

2. Either of the following conditions exist:

   A. RCS boundary failure (refer to section 4.10.2)
   B. Challenge to RCS boundary (refer to section 4.11.2)

AND

3. Either of the following conditions exist:

   A. Containment Integrity failure (refer to section 4.10.3)
   B. Challenge to Containment Integrity (refer to section 4.11.3)

RELATED EALS:

	TAB
Containment Radiation High/Very High	1
Core Melt	1
Radiological Effluents	5
Natural Events	8

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: Emergency Response/Notifications	DOCUMENT NO. 1903.011	CHANGE NO. 028-00-0
	WORK PLAN EXP. DATE N/A	TC EXP. DATE N/A
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**Effective Communication**
Distraction/Interruption	**Questioning Attitude**
Multiple Tasks	**Placekeeping**
Overconfidence	**Self Check**
Vague or Interpretive Guidance	**Peer Check**
First Shift/Last Shift	**Knowledge**
Peer Pressure	**Procedures**
Change/Off Normal	**Job Briefing**
Physical Environment	**Coaching**
Mental Stress (Home or Work)	**Turnover**

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	**1000.006A**	**050-00-0**

ATTACHMENT 4
GENERAL EMERGENCY

Upon declaration of a General Emergency, the person with the responsibility for Emergency Direction and Control shall:

- Complete the appropriate Emergency Direction and Control Checklist indicated below for your position (i.e. SM, TSC Director, or EOF Director). Any steps that are not appropriate for the event may be marked 'Not Applicable' (N/A).

- Issue appropriate offsite protective action recommendations.

- Ensure that notifications are completed in accordance with the required time limits.

At the termination of the event, the Shift Manager/TSC Director/EOF Director should forward all forms and other pertinent documents to Emergency Planning.

Forms, used for General Emergency notification and response, are as follows:

Form 1903.011S, "GE Emergency Direction and Control Checklist, Shift Manager" (**Shift Manager Only**)

Form 1903.011T, "GE Emergency Direction and Control Checklist, TSC Director" (**TSC Director Only**)

Form 1903.011U, "GE Emergency Direction and Control Checklist, EOF Director" (**EOF Director Only**)

Electronic Form 1903.011-Y, "Emergency Class Initial Notification Message"

Electronic Form 1903.011-Z, "Emergency Class Follow-up Notification Message"

Attachment 5, Alternate ERO Notification Scheme

Attachment 6, Protective Action Recommendations (PAR) for General Emergency

GE

This form is intended to be used by the **SHIFT MANAGER** when a General Emergency has been declared and the Shift Manager has the responsibility for emergency Direction and Control.

☐1. General Emergency declared:

Unit_____ Time_____ Date_____

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

☐2. Conditions warranting declaration of a General Emergency:
EAL No._____ Description: _____
_____
_____

☐3. Notification Communicator

☐3.1 **Single/Dual Unit Emergency**

☐1. Activate CNS

IF CNS already activated for an Alert or higher emergency class, **THEN** go to step 2 below.

Direct your unit's Shift Engineer to activate CNS in accordance with Attachment 9 of this procedure.

☐ Use Section 8 of Attachment 9 if ERO is at risk due to site conditions (e.g. security event, toxic gas release, major onsite fire, etc). ERO will respond to the Alternate EOF.

☐ Use Section 1 of Attachment 9 for normal ERO callout.

☐2. Direct the opposite unit's Shift Engineer to perform notifications using Form 1903.011-Y, "Emergency Class Initial Notification Message."

☐3.2 **Additional Notification Communicator is Available**

☐1. **IF** a Notification Communicator is available, **THEN** request the Notification Communicator to perform notifications in accordance with Form 1903.011-Y, "Emergency Class Initial Notification Message."

☐4. Inform the Control Room staff of the Emergency Class declaration.

☐5. Has a plant evacuation been performed,

☐ **NO - GO TO** Step 6

☐ **YES - THEN** perform the following:

☐A. Dial 197

☐B. Make the following announcement:

"Attention all personnel. Attention all personnel. A General Emergency has been declared on Unit ___(One/Two). Emergency response personnel report to your designated assembly areas."

☐C. Dial 197 and repeat the above announcement.

☐D. Repeat the above announcement using the EOF public address system by dialing 199 and pausing approximately 15 seconds before making the announcement.

☐E. **GO TO** step 15.

Plant Evacuation Section

☐6. Determine the appropriate evacuation routes:

☐6.1 **DOES** a radiological or toxic gas release exist or is a release suspected, which is originating from the plant?

☐ **YES** - **THEN** determine the available routes from the chart below using wind direction.

IF wind direction is From:	**THEN** use Evacuation Routes
0 to 100 degrees	☐ 1 and 2
101 to 220 degrees	☐ 1
221 to 359 degrees	☐ 2

☐ **NO** - **THEN** use routes 1 and/or 2.

☐6.2 Check the appropriate routes in the plant announcement, step 10 below.

☐7. Determine any areas of the plant to avoid during evacuation and/or special protective measures to be taken by plant evacuees. List these instructions in plant announcement Step 10 below.

☐8. Direct Security to perform the following (ext. 3388, 3108 or 3109):

☐8.1 Use manual scanning to expedite evacuation, if necessary.

☐8.2 Perform initial accountability by _____ (Time)
(30 minutes from GE declaration)

☐9. Contact Radiation Protection (CA1 - 5166 or CA2 - 3018):

☐9.1 Request Health Physics coverage at the plant exit portal monitors.

☐9.2 Instruct Health Physics personnel at the controlled access exit point to relax decontamination and radiation protection measures as necessary in order to expedite evacuation of the controlled access area.

☐10. **[Make the following announcement using the plant paging system (dial 197):**

"Attention all personnel. Attention all personnel. A General Emergency has been declared on Unit ___(One/Two). Emergency response and emergency standby personnel report to your designated assembly areas and perform initial accountability. All other personnel evacuate the plant using evacuation route(s) ☐ 1 ☐ 2 and proceed to the Atkins Emergency Worker Center."

If necessary, include in the announcement any plant areas to avoid, or special protective actions to be taken by plant evacuees: _____

_____

_____

☐**10.1 Sound the evacuation alarm for approximately 10 seconds.**

☐**10.2 Repeat the announcement at least 2 times, alternating the announcement with the plant evacuation alarm.]**

☐11. Make the following announcement using the EOF public address system (dial 199 and pause approximately 15 seconds).

"Attention all personnel. Attention all personnel. A General Emergency has been declared on Unit ___(One/Two). Emergency response personnel report to your designated assembly areas."

☐12. Instruct all Control Room personnel (operators, chemists, RP, etc.) to log into the designated security card reader using "0000".

☐13. Instruct both units' operators in the field to log into the nearest security card reader using "0000" and log onto the emergency RWP.

☐14. Inform the opposite unit Control Room personnel to log into the designated security card reader using "0000".

☐15. Has an exclusion area evacuation been performed?

☐ **YES** - **GO TO** Step 16.

☐ **NO** - **THEN** perform the following:

☐ Request that the U.S. Army Corps of Engineers (telephone number located in Emergency Telephone Directory) control boat access to the portions of Lake Dardanelle within the exclusion area.

☐ Direct Security to evacuate the Generation Support Building (GSB) and all buildings outside the security fence but within the exclusion area.

Plant Evacuation Section Ends

☐16. Determine the appropriate Protective Action Recommendation using Attachment 6, "Protective Action Recommendations (PAR) for General Emergency".

PAR No. _____

Review PAR criteria every 15 minutes. Notify within 15 minutes the NRC, State and local government of PAR changes in accordance with Form 1903.011-Y, "Emergency Class Initial Notification Message."

☐17. Direct Chemistry personnel (Initial Dose Assessor) to the Control Room to implement procedure 1904.002, "Offsite Dose Projection - RDACS Computer Method".

☐18. **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 which prohibit entry to the site via secondary guard station, etc.)

Performed by:_____
Shift Manager

Facility: ANO-1 Date of Examination: 9/12/2005

Exam Level (circle one): RO / SRO(I) / SRO(U) Operating Test No.: One

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

System / JPM Title	Type Code*	Safety Function
a. A1JPM-RO-EOP22, Perform Reactor Trip Immediate Actions 007 EK3.01 (RO 4.0/SRO 4.6)	A/M/S	1 Reactivity
b. A1JPM-RO-LTOP1, Establish LTOP protection during cool down of RCS 002 K4.10 (RO 4.2/SRO 4.4)	D/L/S	3 Reactor Pressure Control
c. A1JPM-RO-RCP05, Shutdown of P-32C and P-32D after Decay Heat in service 003 A4.03 (RO 2.8/SRO 2.5)	D/L/S	4 Reactor Heat Removal (Primary)
d. A1JPM-RO-EOP16, Perform actions required to correct overcooling of the RCS 039 A2.04 (RO 3.4/SRO 3.7)	A/D/S	4 Reactor Heat Removal (Secondary)
e. A1JPM-RO-HYD03, Place Hydrogen Recombiner M-55B in operation 028 A4.01 (RO 4.0/SRO 4.0)	C/D/L/S	5 Containment Integrity
f. A1JPM-RO-EDO08, Shift buses A1, A2, H1, H2 from SU#1 to Unit Aux 062 A4.07 (RO 3.1/SRO 3.1)	A/D/S	6 Electrical
g. A1JPM-RO-ARM01, Respond to Area Rad Monitor alarm 072 A4.01 (RO 3.0/SRO 3.3)	C/N/S	7 Instrumentation
h. 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-CA01, Borate via alternate path bypassing batch controller 004 K6.13 (RO 3.1/SRO 3.3)	N/R	1 Reactivity
j. A1JPM-RO-EFW02, Manually control P-7A at turbine 061 A2.05 (RO 3.1/SRO 3.4)	D/E/R	4 Reactor Heat Removal (Secondary)
k. A1JPM-RO-EDO30, Place battery charger D-03B in service 2.1.30 (RO 3.9/SRO 3.4)	A/D/P	6 Electrical

@ All control room (and in-plant) systems must be different and serve different safety functions;

*Type Codes	Criteria for RO /SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)direct from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 Exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility: ANO-1 Date of Examination: 9/12/2005

Exam Level (circle one): RO / (SRO(I)) / SRO(U) Operating Test No.: One

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

System / JPM Title	Type Code*	Safety Function
a. A1JPM-RO-EOP22, Perform Reactor Trip Immediate Actions 007 EK3.01 (RO 4.0/SRO 4.6)	A/M/S	1 Reactivity
b. A1JPM-RO-LTOP1, Establish LTOP protection during cool down of RCS 002 K4.10 (RO 4.2/SRO 4.4)	D/L/S	3 Reactor Pressure Control
c. A1JPM-RO-RCP05, Shutdown of P-32C and P-32D after Decay Heat in service 003 A4.03 (RO 2.8/SRO 2.5)	D/L/S	4 Reactor Heat Removal (Primary)
d. A1JPM-RO-EOP16, Perform actions required to correct overcooling of the RCS 039 A2.04 (RO 3.4/SRO 3.7)	A/D/S	4 Reactor Heat Removal (Secondary)
e. A1JPM-RO-HYD03, Place Hydrogen Recombiner M-55B in operation 028 A4.01 (RO 4.0/SRO 4.0)	C/D/L/S	5 Containment Integrity
f. A1JPM-RO-EDO08, Shift buses A1, A2, H1, H2 from SU#1 to Unit Aux 062 A4.07 (RO 3.1/SRO 3.1)	A/D/S	6 Electrical
g. A1JPM-RO-ARM01, Respond to Area Rad Monitor alarm 072 A4.01 (RO 3.0/SRO 3.3)	C/N/S	7 Instrumentation
h.		

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

i. A1JPM-RO-CA01, Borate via alternate path bypassing batch controller 004 K6.13 (RO 3.1/SRO 3.3)	N/R	1 Reactivity
j. A1JPM-RO-EFW02, Manually control P-7A at turbine 061 A2.05 (RO 3.1/SRO 3.4)	D/E/R	4 Reactor Heat Removal (Secondary)
k. A1JPM-RO-EDO30, Place battery charger D-03B in service 2.1.30 (RO 3.9/SRO 3.4)	A/D/P	6 Electrical

@ All control room (and in-plant) systems must be different and serve different safety functions;

*Type Codes	Criteria for RO /SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)direct from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 Exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility: ANO-1 Date of Examination: 9/12/2005

Exam Level (circle one): RO / SRO(I) / SRO(U) Operating Test No.: One

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

System / JPM Title	Type Code*	Safety Function
a. A1JPM-RO-EOP22, Perform Reactor Trip Immediate Actions 007 EK3.01 (RO 4.0/SRO 4.6)	A/M/S	1 Reactivity
b. A1JPM-RO-LTOP1, Establish LTOP protection during cool down of RCS 002 K4.10 (RO 4.2/SRO 4.4)	D/L/S	3 Reactor Pressure Control
c. A1JPM-RO-ARM01, Respond to Area Rad Monitor alarm 072 A4.01 (RO 3.0/SRO 3.3)	C/N/S	7 Instrumentation
d.		
e.		
f.		
g.		
h.		

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

i. A1JPM-RO-EFW02, Manually control P-7A at turbine 061 A2.05 (RO 3.1/SRO 3.4)	D/E/R	4 Reactor Heat Removal (Secondary)
j. A1JPM-RO-EDO30, Place battery charger D-03B in service 2.1.30 (RO 3.9/SRO 3.4)	A/D/P	6 Electrical
k.		

@ All control room (and in-plant) systems must be different and serve different safety functions;

*Type Codes	Criteria for RO /SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)direct from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 Exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

TUOI NUMBER: A1JPM-RO-EOP22

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 0 Date: _____

System/Duty Area: Emergency and Abnormal Operations

Task: Emergency Boration

JA# ANO1-RO-EOP-EMERG-55

KA Value RO 4.0 SRO 4.6 KA Reference 007 EK3.01

Approved 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): 1202.012, Repetitive Tasks, 004-03-0

_____

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.
gnature 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-EOP22

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:

Two control rods failed to insert upon a reactor trip, CRD AC breakers did trip and the CRD Power Supply Breaker PBs on C03 have been depressed.

TASK STANDARD:

Boric acid is being injected into the RCS by the operating HPI pump from the BWST. ***This is an Alternate Success Path JPM.***

TASK PERFORMANCE AIDS: 1202.012, RT-12, Emergency Boration

NOTE: This is an Alternate Success Path JPM intended to be performed, not simulated.

NOTES TO IA OPERATOR AND EXAMINER:

1. ***P-36C or B on the A-4 side must be the operating HPI pump, withP-36A the ES pump.***
2. ***Fail CV-1250 in the closed position; this forces the alternate option for Emergency Boration***

TUOI NUMBER: A1JPM-RO-EOP22

INITIATING CUE: The CRS/SM directs you to perform Emergency Boration per RT-12.

CRITICAL ELEMENTS (c): 5, 7

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
INSTRUCTOR NOTE:					
	1. Set Batch Controller for maximum batch size (999999). POSITIVE CUE: Batch Controller set to add 999999 gallons.	Batch set key depressed, 999999 gallons batch size set by depressing appropriate number keys. Depressed enter and lower display keys in sequence (red LED next to display key should be on.).	___	___	___
	2. Verify Condensate to Batch Controller (CV-1251) closed. POSITIVE CUE: CV-1251 green light on.	On C04, verified CV-1251 closed.	___	___	___
	3. Open CV-1250. FAULTED CUE: CV-1250 green light on and red light off	On C04, attempted to open CV-1250; identified that CV-1250 failed to open.	___	___	___
	4. Place RCP Seal Inj. Block (CV-1206) in override. POSITIVE CUE: CV-1206 in OVRD.	At C04, placed CV-1206 in OVRD.	___	___	___
C	5. WHEN BWST Outlet is open, THEN open HPI Block valve (CV-1285) to maintain PZR level 200 to 220". POSITIVE CUE: CV-1285 red light on.	On C-16, opened CV-1285.	___	___	___
	6. Place 3-way valve (CV-1248 in BLEED) POSITIVE CUE: CV-1248 blue light on, red light off.	On C04, placed CV-1248 in the BLEED position	___	___	___
EXAMINER: If PZR level is less than 100", inform examinee that PZR level is 110", slowly rising.					
C	7. When PZR level is ≥100", THEN establish maximum Letdown flow. POSITIVE CUE: Letdown flow is 80 gpm. NEGATIVE CUE: Letdown flow is 40 gpm	On C04, adjusted CV-1223 to raise Letdown flow to at least 70-80 gpm	___	___	___
NOTE: Terminate JPM when maximum Letdown flow is established.					

END

TUOI NUMBER: A1JPM-RO-EOP22

INITIAL CONDITIONS:

Two control rods failed to insert upon a reactor trip, CRD AC breakers did trip and the CRD Power Supply Breaker Trip PBs on C03 have been depressed.

INITIATING CUE:

The SM/CRS directs you to perform Emergency Boration per RT-12.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **REPETITIVE TASKS**	DOCUMENT NO. **1202.012**	CHANGE NO. **004-03-0**
	WORK PLAN EXP. DATE **N/A**	TC EXP. DATE **N/A**
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	Effective Communication
Distraction/Interruption	Questioning Attitude
Multiple Tasks	Placekeeping
Over Confidence	Self Check
Vague or Interpretive Guidance	Peer Check
First Shift/Last Shift	Knowledge
Peer Pressure	Procedures
Change/Off Normal	Job Briefing
Physical Environment	Coaching
Mental Stress (Home or Work)	Turnover

VERIFIED BY	DATE	TIME

FORM TITLE: VERIFICATION COVER SHEET	FORM NO. 1000.006A	CHANGE NO. 050-00-0

12. Emergency Boration:

A. **IF** Boric Acid pump (P39A or B) and Batch Controller are available, **THEN** perform the following:

1) Set Batch Controller for maximum batch size (999999).

2) Verify Condensate to Batch Controller (CV-1251) closed.

3) Open Batch Controller Outlet (CV-1250).

4) Verify both Letdown Filters in service (F-3A and B).

5) Record initial BAAT (T-6) level _____ in.

6) Start available Boric Acid Pump(s) (P-39A or B or both).

7) Start Batch Controller by depressing RUN key.

8) Adjust Batch Controller Flow CNTRL VLV (CV-1249) to 100% open.

9) Adjust Pressurizer Level Control Setpoint to 220".

10) Open BWST Outlet to OP HPI Pump (CV-1407 or 1408).

11) **WHEN** PZR level is ≥ 100", **THEN** establish maximum Letdown flow.

12) 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).

(12. CONTINUED ON NEXT PAGE)

12. (Continued).

13) 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.

14) **WHEN** required amount of boric acid has been added per **step 13)**
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)

12. (Continued).

B. **IF** no Boric Acid pumps are available (P39A or B),
OR
Batch Controller is **not** available,
THEN perform the following:

1) Initiate HPI (RT 2) **AND** perform the following:

a) Open HPI Block valve (CV-1220 or 1285) associated with running HPI Pump to maintain PZR level 200 to 220".

2) Place 3-Way valve in BLEED.

3) **WHEN** PZR level is ≥ 100", **THEN** establish maximum Letdown flow.

4) 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.

5) **WHEN** required amount of boric acid has been added per **step 4)**
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** 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.

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** 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

(2. CONTINUED ON NEXT PAGE)

2. (Continued).

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.

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).

(2. CONTINUED ON NEXT PAGE)

2. (Continued).

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)

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

JOB PERFORMANCE MEASURE

UNIT: 1 REV # 2 DATE: _____

TUOI NUMBER: A1JPM-RO-LTOP1

SYSTEM/DUTY AREA: REACTOR COOLANT SYSTEM

TASK: ESTABLISH LTOP PROTECTION DURING COOLDOWN OF THE RCS

JTA#: ANO1-RO-RCS-NORM-2

KA VALUE RO: 4.2 SRO: 4.4 KA REFERENCE: 002 K4.10

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK 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: _____ PLANT SITE: _____ LAB: _____

TESTING METHOD: SIMULATE: _____ PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 10 MINUTES

REFERENCE(S): 1102.010 Chg. 053-11-0

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: _____
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-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 cooldown with RCS temperature <300°F but >275°F. RCS pressure as indicated on PT-1020 "A" Loop WR Pressure (ESAS-1) is less than 380 psig.

TASK STANDARD: LTOP established with all HPI MOVs in the LTOP position and ERV block open and ERV setpoint switch in the 400 psig position.

TASK PERFORMANCE AIDS: 1102.010 Step 10.2

TUOI NUMBER: A1JPM-RO-LTOP1

INITIATING CUE:

The SM/CRS directs you to establish LTOP protection as per step 10.2 1102.010.

CRITICAL ELEMENTS (C): 2, 6

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Verify RC pressure is ≤380 psig. POSITIVE CUE: RC pressure is 360 psig.	Verified pressure ≤380 psig on as indicated on PT-1020	____	____	____
(C)	2. Place ERV Setpoint hand switch in 400 PSIG position. POSITIVE CUE: 400 PSIG amber light lit. NEGATIVE CUE: 2450 PSIG white light lit.	On C04, positioned the ERV Setpoint hand switch to the 400 PSIG position.	____	____	____
	3. Verify the ERV Isolation (CV-1000) open. POSITIVE CUE: red light ON, green light OFF. NEGATIVE CUE: green light ON, red 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, verify the following LTOP alarm plant computer points are do not have a quality of DEL: • RCS Loop "A" Inlet Temperature Wide Range T1016 and T1017 • LTOP Trouble Alarm T3071 • RCS Overpressurization Enable PS3086 • LTOP Constant (272 °F) CON272 • POSITIVE CUE: T1016, T1017, T3071, PS3086, CON272 are not deleted.	On the plant computer, used SVD function and selected T1016, T1017, T3071, PS3086 and CON272 and verified that each point does not have a quality of DEL.	____	____	____

TUOI NUMBER: A1JPM-RO-LTOP1

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	5. Verify pressurizer level is between 70" and 95". POSITIVE CUE: Pressurizer level is 85".	Verified Pressurizer level between 70 to 95" on level indicators located on C04.	_____	_____	_____
EXAMINER NOTE: If trainee asks, inform that Pressurizer level is being plotted and RCS cooldown rate is within the specifications of Att. J.					
(C)	6. Close the following HPI MOVs and place 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 POSITIVE CUE: green lights ON for all valves, white LTOP in "NORMAL" lights OFF for all valves. NEGATIVE CUE: red light ON or white LTOP in "NORMAL" light ON for any applicable mispositioned valve/key switch.	On C16 and C18, verified each HPI valve closed and placed key switch for each valve in the LTOP position with white lights OFF.	_____	_____	_____
EXAMINER NOTE: Inform trainee that it is not desired to unprotect Pressurizer level computer points.					

END

TUOI NUMBER: A1JPM-RO-LTOP1

INITIAL CONDITIONS:

The plant is in a cool down with RCS temperature <300°F but >275°F.
RCS pressure as indicated on PT-1020 "A" Loop WR Pressure (ESAS-1) is less than 380 psig.

INITIATING CUE:

The SM/CRS directs you to establish LTOP protection as per step 10.2 1102.010.

10.0 Establishing Decay Heat Removal System Operation

10.1 IF going to Mode 5, THEN implement Containment Closure Control per Decay Heat Removal and LTOP System Control (1015.002), Attachment G prior to placing plant in a condition where containment integrity is not required. _____

10.1.1 Complete Attachment G of 1015.002 for applicable valves listed in Category E/Locked Component Log (E-doc 1015.001H). _____

{4.3.2}

10.2 WHEN RC temperature is <300°F but >275°F, THEN verify RC pressure is ≤380 psig as indicated on PT-1020 (SPDS P1020) and establish LTOP protection as follows: _____

10.2.1 Place ERV Setpoint hand switch in 400 PSIG position. _____

10.2.2 Verify ERV Isolation (CV-1000) open . _____

10.2.3 IF the plant computer is operating, THEN verify by using computer function SVD or GD (LTOP) that the following LTOP alarm plant computer points do NOT have a quality of DEL. _____

- **RCS Loop "A" Inlet Temperature Wide Range (T1016 and T1017)** _____
- **LTOP TROUBLE Alarm (T3071)** _____
- **RCS Overpressurization Enable (PS3086)** _____
- **LTOP Constant (272°F) (CON272)** _____

10.2.4 IF the plant computer is NOT operating, THEN contact Computer Support to enable LTOP alarm. _____

NOTE

- For LTOP concerns, maximum allowable Pressurizer level with RCS temperature <272°F and Reactor Vessel head in place is:
  - ≤105" at RCS pressures >100 psig
  - ≤150" at RCS pressures ≤100 psig
- Annunciator "LTOP Trouble" (K09-E7) alarms at the following Pressurizer level setpoints with RCS temperature <272°F:
  - 95" at RCS pressures >100 psig
  - 140" at RCS pressures ≤100 psig

10.2.5 Verify Pressurizer level is between 70" and 95". ⟵

10.2.6 Monitor and plot Pressurizer level vs. time during cooldown at least once every 15 minutes while RCS temperature is ≤272°F (SR 3.4.11.1). ⟵

10.2.7 Limit RCS cooldown rate as necessary to maintain RCS temperature above and to the right of the RCS Functional Specification curve, Attachment J. ⟵

10.2.8 For each of the following HPI to P-32(A, B, C, or D) Discharge valves, close valve and place key switch in LTOP position.

- CV-1227 _____
- CV-1228 _____
- CV-1284 _____
- CV-1285 _____

- CV-1278 _____
- CV-1279 _____
- CV-1219 _____
- CV-1220 _____

10.2.9 IF desired, _____
THEN contact Computer Support to unprotect the alarm functions on the plant computer for PZR Level (L1001B and L1002B).

A. WHEN unprotected, _____
THEN adjust setpoints below current LTOP requirements. N/A if not performed.

NOTE

RCS maximum cooldown rate from 280°F to 150°F is 50°F/hr, which equates to 0.83°F/min.

10.3 Prior to cooling below 280°F, establish a cooldown rate of ≤50°F/hr. _____

JOB PERFORMANCE MEASURE

UNIT: 1 REV # 1 DATE: _____

TUOI NUMBER: A1JPM-RO-RCP05

SYSTEM/DUTY AREA: REACTOR COOLANT PUMP SYSTEM

TASK: Shutdown P-32C & D after DH in service.

JTA#: ANO1-RO-RCP-NORM-3

KA VALUE RO: 2.8 SRO: 2.5 KA REFERENCE: 003 A4.03

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK 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: _____ PLANT SITE: _____ LAB: _____

TESTING METHOD: SIMULATE: _____ PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 20 MINUTES

REFERENCE(S): 1102.010 Chg. 053-11-0, 1103.006 Chg. 025-04-0

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: _____

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

JOI NUMBER: A1JPM-RO-RCP05

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

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

JPM INITIAL TASK CONDITIONS: Plant cooldown is in progress. "A" DHR is in service. "C" and "D" RCPs are operating. Hot leg cooling is no longer required. RCS is at the desired boron concentration. Predictive maintenance is standing by.

TASK STANDARD: "C" and "D" RCPs off and cooldown on DH commenced.

TASK PERFORMANCE AIDS: 1102.010 and 1103.006.

ADMINISTRATION NOTE:
Ensure 1102.010 procedure has T-cold temperature recorded for simulator conditions.

OI NUMBER: A1JPM-RO-RCP05

INITIATING CUE:

The SM/CRS directs you to stop "C" and "D" RCPs and re-commence cooldown using "A" DHR loop in accordance with 1102.010, step 10.15.6. Steps 10.15.1 through 10.15.5 have been completed.

CRITICAL ELEMENTS (C): 1, 2, 4, 12

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
(C)	1. Establish DH cooler outlet temp 10 to 15 °F below T-cold temp. POSITIVE CUE: DH Cooler outlet temperature is 10°F to 15 °F below T-cold temp.	On C-14/C-18, adjusted DH cooler bypass/outlet valves until DH cooler outlet temperature was between 10 °F to 15 °F below T-cold value recorded in previous step.	____	____	____
(C)	2. Start HP Oil Lift Pump, Emergency HP Oil Lift Pump, and Backup Backstop Lube Oil Pumps for "C" and "D" RCPs. POSITIVE CUE: HP Oil Lift Pumps and Backstop Lube oil Pumps red lights ON green lights OFF.	Started HP Oil Lift Pumps (P-63), Emergency HP Oil Lift Pumps (P-80), and Backup Backstop Lube Oil Pumps (P-82) for "C" and "D" RCPs by placing handswitches on C-12 to the start position.	____	____	____
	3. Verify Backstop Lube Oil Pumps running for "C" and "D" RCPs. POSITIVE CUE: Backstop Lube Oil Pumps red lights ON, green lights OFF.	On C-12, verified Backstop Lube Oil Pumps (P81) running for "C" and "D" RCPs.	____	____	____
(C)	4. Stop RCP s. POSITIVE CUE: "C" "D" RCPs green lights ON red lights OFF.	Stopped "C" and "D" RCPs by placing the handswitches on C-12 to the stop position. Last RCP was stopped within two minutes of stopping previous RCP.	____	____	____
	5. Verify HP Oil Lift Pumps and Backstop Lube Oil Pumps remain on during RCP coastdown. POSITIVE CUE: HP Oil Lift Pumps and Backstop Lube Oil Pumps red lights ON green lights OFF.	Verified HP Oil Lift Pumps and Backstop Lube Oil Pumps remain on during RCP coastdown.	____	____	____

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	6. Verify shafts stop, without reverse rotation. POSITIVE CUE: Predictive maintenance reports shaft is stopped.	Verified shafts stopped without reverse rotation by: • Report from predictive maintenance. or • RCS loop flow indication • Plant computer reverse rotation alarm remains clear.	_____	_____	_____
	7. When shaft has stopped, stop all oil pumps for the idle RCP. POSITIVE CUE: "C" and "D" oil pumps red lights OFF and green lights ON.	Stopped all oil pumps for "C" and "D" RCPs by placing the handswitches on C-12 in the PULL-TO-LOCK position.	_____	_____	_____
	8. While RCS is >150 °F, maintain seal injection flow and ICW flow to RCP Seal Cooling Water Heat Exchangers. POSITIVE CUE: Seal injection and seal cooling is being maintained.	Verified seal injection flow and ICW flow to RCP Seal Cooling Water Heat Exchangers.	_____	_____	_____
	9. Maintain ICW flow to RCP Motor Air Coolers. POSITIVE CUE: RCP motor cooling is being maintained.	Verified ICW flow to RCP Motor Air Coolers.	_____	_____	_____
	10. After RCP coast-down, record DH cooler outlet temperature. POSITIVE CUE: DH cooler outlet temperature is 204 °F.	Recorded DH cooler outlet temperature in step 10.15.6 of 1102.010.	_____	_____	_____
	11. Verify step change is <15°F: CET temperature (step 1) minus DH cooler outlet temperature. POSITIVE CUE: Step change is <15 °F.	Verified step change was <15 °F and recorded step change in 1102.010.	_____	_____	_____
INSTRUCTOR NOTE: The examinee only needs to adjust the DH cooler bypass/outlet valves to satisfy the next step.					

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
(C)	12. Slowly adjust DH cooler outlet temp to establish RCS cooldown rate < 50°/hr. POSITIVE CUE: RCS cooldown rate is < 50 °F/hr. NEGATIVE CUE: RCS is heating up.	Slowly adjusted "A" DH cooler outlet/bypass valves while observing "A" DH cooler outlet temperature to establish a cooldown rate < 50°F/hr.	_____	_____	_____

END

TUOI NUMBER: A1JPM-RO-RCP05

JPM INITIAL TASK CONDITIONS:

Plant cooldown is in progress.
"A" DHR is in service.
"C" and "D" RCPs are operating.
Hot leg cooling is no longer required.
RCS is at the desired boron concentration.
Predictive maintenance is standing by.

INITIATING CUE:

The SM/CRS directs you to stop "C" and "D" RCPs and re-commence cooldown using "A" DHR loop in accordance with 1102.010, step 10.15.6. Steps 10.15.1 through 10.15.5 have been completed.

NOTE

- If the RCS is to be opened after cooldown, it is desirable to run the RCPs in parallel with the Decay Heat system to cool the RCS hot legs. This helps to prevent flashing in the hot legs when the RCS is depressurized. RCP NPSH limits of Att. A must be met during RCP and DH system parallel operation.
- RCPs should be secured together or as near together as feasible.

10.15 WHEN CET temperature is between 166°F and 270°F AND when cooling RCS hot legs is no longer desired, THEN secure RCPs as follows:

10.15.1 IF performed, THEN verify Acid Reducing Phase of the Reactor Coolant Shutdown Chemistry per RCS Shutdown Chemistry Program (1604.050) complete. _____

10.15.2 Stabilize SG levels. _____

10.15.3 Verify RCS at final desired boron concentration. _____

10.15.4 Record T-cold temperature used for plotting cooldown rate: _____°F _____

10.15.5 Stop RCS cooldown. _____

CAUTION

If in Mode 5 and adequate margin does not exist to 200°F RCS temperature, an unexpected mode change may occur when DH cooler outlet temperature is adjusted to <15°F below T-cold temperature.

NOTE

Plant Computer points T1406 and T1407 are the most accurate indication of DH cooler outlet temperature and should be used when available.

10.15.6 The following steps should be performed expeditiously to minimize RCS heatup:

A. Prior to stopping RCPs, adjust DH cooler outlet temp to <15°F below T-cold temp used for plotting cooldown rate. _____

B. Stop both RCPs per Reactor Coolant Pump Operation (1103.006), "RCP Stop" section. _____

C. Record DH cooler outlet temperature _____°F. _____

NOTE

Step change limit of <15°F is applicable only during transition from RCP operation to DH Removal. This step change must be included when calculating cooldown rate.

D. Check step change is <15°F: _____
T-cold temperature (step 10.15.4) minus
DH cooler outlet temperature =
Step Change = _____°F.

NOTE

- 50°F/hr is equivalent to 12.5°F change per 15 minute plot.
- >25°F change in <30 minutes is a violation of Tech Spec cooldown limit.

10.15.7 Slowly adjust DH cooler outlet temp to establish RCS cooldown rate <50°F/hr (<0.83°F/min). _____

10.15.8 IF desired by Chemistry department, THEN continue cycling SG levels until ready for wet layup. ⬅

10.16 Continue cooldown plot as follows: ⬅

- Plot DH Cooler outlet temperature from step 10.15.6.C. _____
- Stop plotting T-cold. _____
- Start plotting DH Cooler outlet temperature. _____

10.17 IF required by the Surveillance Test Schedule or the Operations Manager, THEN verify Condensate, Feedwater and Steam System Tests (1305.032), Supplement 3 and 4, MSIV Instrument Air System Leak Test is in progress or has been completed. _____

10.18 Secure main steam heating to Low Pressure Feedwater Heaters (E-2A and E-2B) by closing the following valves, N/A if main steam heating is not being used:

- Main Steam to E-2B Control Valve (CV-3021A) _____
- Main Steam to E-2A Control Valve (CV-3028A) _____
- Main Steam Heating to Feedwater Heater E-2A (CV-3028) _____
- Main Steam Heating to Feedwater Heater E-2B (CV-3021) _____

10.19 IF degassing was required, THEN complete degassing before reducing RC pressure below that required to maintain adequate letdown flow rate. _____

10.0 RCP Stop

10.1 IF RCP is tripped
OR emergency manual trip is required,
THEN refer to Reactor Coolant Pump Trip (1203.022).

10.2 IF time permits,
THEN contact predictive maintenance to install backup indication of RCP zero speed prior to RCP stop.

{4.3.1}

CAUTION

- **Stopping or shifting RCPs or changing RCP loop configuration when RPS is reset can cause a reactor trip or an ICS runback.**
- **Stopping the last RCP prior to bypassing EFIC will cause EFW actuation.**

10.3 IF RPS is reset,
AND
NOT in Shutdown Bypass,

THEN perform the following:

- Maintain 1 RCP per loop.
- Notify load dispatcher of any load change.
- IF stopping 1 of 4 RCPs,
  THEN reduce power to ≤60%.

CAUTION

Operation with only 1 RCP in each loop is permitted for 18 hours with the Rx Critical per TS 3.4.4 Condition A. Mode 3 is required within an additional 6 hours per TS 3.4.4 Condition B.

- IF stopping 1 of 3 RCPs, resulting in 1 pump per loop,
  THEN reduce power to ≤40%.

CAUTION

Single pump operation in excess of 2 minutes may cause pump damage due to inadequate flow through the hydrostatic bearing.

NOTE

Computer alarm BACKSTOP LO FLOW will not clear until both backstop oil pumps are running with adequate flow. (not applicable for P-32B)

10.4 Stop RCP(s) as follows:

10.4.1 IF P-32A,
THEN perform the following:

NOTE

During RCP start, running only one HP Oil Lift Pump will insure adequate HP Oil Lift pressure.

A. Start the following pumps:

- HP Oil Lift Pump (P-63A)
- Emergency HP Oil Lift Pump (P-80A)

NOTE

Flow through each Backstop Lube Oil Pump and Backup Backstop Lube Oil Pump can be verified utilizing the following computer points:

- P-81A (FS-6520)
- P-82A (FS-6525)

B. Start the BACKUP Backstop Lube Oil Pump (P-82A).

C. Verify Backstop Lube Oil Pump (P-81A) indicates running.

D. Stop P-32A.

NOTE

P-32B has a mechanical anti-reverse rotation device that is extremely noisy during startup and coast down.

E. IF only one RCP remains running,
THEN stop the remaining RCP within 2 minutes.

10.4.2 IF P-32C,
THEN perform the following:

NOTE

During RCP start, running only one HP Oil Lift Pump will insure adequate HP Oil Lift pressure.

A. Start the following pumps:

- HP Oil Lift Pump (P-63C)
- Emergency HP Oil Lift Pump (P-80C)

NOTE

Flow through each Backstop Lube Oil Pump and Backup Backstop Lube Oil Pump can be verified utilizing the following computer points:

- P-81C (FS-6522)
- P-82C (FS-6527)

B. Start the BACKUP Backstop Lube Oil Pump (P-82C).

C. Verify Backstop Lube Oil Pump (P-81C) indicates running.

D. Stop P-32C.

NOTE

P-32B has a mechanical anti-reverse rotation device that is extremely noisy during startup and coast down.

E. IF only one RCP remains running,
THEN stop the remaining RCP within 2 minutes.

10.4.3 IF P-32D,
THEN perform the following:

NOTE

During RCP start, running only one HP Oil Lift Pump will insure adequate HP Oil Lift pressure.

A. Start the following pumps:

- HP Oil Lift Pump (P-63D)
- Emergency HP Oil Lift Pump (P-80D)

NOTE

Flow through each Backstop Lube Oil Pump and Backup Backstop Lube Oil Pump can be verified utilizing the following computer points:

- P-81D (FS-6523)
- P-82D (FS-6528)

B. Start the BACKUP Backstop Lube Oil Pump (P-82D).

C. Verify Backstop Lube Oil Pump (P-81D) indicates running.

D. Stop P-32D.

NOTE

P-32B has a mechanical anti-reverse rotation device that is extremely noisy during startup and coast down.

E. IF only one RCP remains running,
THEN stop the remaining RCP within 2 minutes.

10.4.4 IF stopping P-32B,
THEN start P-63B OR P-80B.

NOTE

P-32B has a mechanical anti-reverse rotation device that is extremely noisy during startup and coast down.

A. Stop P-32B.

B. IF only one RCP remains running,
THEN stop the remaining RCP within 2 minutes.

10.5 Perform the following during RCP coast down:

10.5.1 IF P-32A stopped,
THEN verify the following pumps remain on:

- HP Oil Lift Pump (P-63A)
- Backstop Lube Oil Pump (P-81A)

10.5.2 IF P-32C stopped,
THEN verify the following pumps remain on:

- HP Oil Lift Pump (P-63C)
- Backstop Lube Oil Pump (P-81C)

10.5.3 IF P-32D stopped,
THEN verify the following pumps remain on:

- HP Oil Lift Pump (P-63D)
- Backstop Lube Oil Pump (P-81D)

10.5.4 IF P-32B stopped,
THEN verify HP Oil Lift Pump (P-63B) remains on.

10.6 Verify shaft stops, without reverse rotation, as follows:

- Verify Predictive Maintenance or Shift Engineer contacted to install backup indication of zero speed.
- IF associated RCS loop flow is no longer dropping,
THEN consider the shaft stopped.
- Plant computer reverse rotation alarm remains clear.(not applicable for P-32B)

RCP P32-D REVERSE ROTATION (FS6513)
RCP P32-C REVERSE ROTATION (FS6512)
RCP P32-A REVERSE ROTATION (FS6510)

NOTE

Reverse rotation is indicated by the following:

- Computer alarm based on reverse lube oil flow
- RCP high vibration
- RCP motor bearing high temperature

10.7 IF reverse rotation indicated,
THEN trip reactor.

10.7.1 Trip running RCP(s).

10.7.2 Refer to Reactor Trip (1202.001).

10.8 WHEN shaft has stopped,
THEN stop all oil pumps for the idle RCP by placing handswitches in PULL-TO-LOCK. (Backstop Lube Oil Pump not applicable to P-32B)

- Emergency HP Oil Lift Pump (P-80A thru D)
- HP Oil Lift Pumps (P-63A thru D)
- Backstop Lube Oil Pumps (P-81A, C, and D)
- Backup Backstop Lube Oil Pumps (P-82A, C, and D)

10.9 While RCS is >150°F, maintain seal injection flow and ICW flow to RCP Seal Cooling Water Heat Exchangers (E-25A thru D).

10.9.1 Maintain ICW flow to RCP Motor Air Coolers.

RCP Motor Air Coolers (E-41A1 and E-41A2)
RCP Motor Air Coolers (E-41B1 and E-41B2)
RCP Motor Air Coolers (E-41C1 and E-41C2)
RCP Motor Air Coolers (E-41D1 and E-41D2)

10.10 IF RCP stop at power,
THEN perform the following:

10.10.1 Lower the ULD HI-Load Limit 5% below runback limit.

NOTE

RCP breaker status (normal or tripped) feeds NSSS Index Point which is used in the heat balance power calculation.

10.10.2 Verify Plant Computer reflects current RCP breaker status on ZS1H11, ZS1H12, ZS1H21 and ZS1H22.

10.10.3 IF breaker status is incorrect,
THEN contact Computer Support to update Plant Computer to match current breaker status.

NOTE

The Temperature Compensated Total Flow (XWRCFT) and RC Pressure (P1021, P1023, P1038, P1039) alarm limits for the Plant Computer are dependent upon RCP combination. Normally Plant Computer alarm setpoints are operator adjustable, however, these points are some of the alarm points that are blocked that are carried on Tech Spec Cross-check log (OPS-A24). Refer to Unit 1 Operations Logs (1015.003A), Attachment C for these alarm limits.

10.10.4 Request Computer Support to adjust XWRCFT and RC pressure (4 points) alarms for current RCP status.

10.10.5 Continue plant operations per Power Operations, 1102.004.

JOB PERFORMANCE MEASURE

UNIT: 1 REV # 1 DATE: _____

TUOI NUMBER: A1JPM-RO-EOP16

SYSTEM/DUTY AREA: EMERGENCY AND ABNORMAL OPERATIONS

TASK: PERFORM ACTIONS REQUIRED TO CORRECT OVERCOOLING OF THE RCS (DUE TO TBVs)

JTA#: ANO1-RO-EOP-EMERG-14

KA VALUE RO: 3.4 SRO: 3.7 KA REFERENCE: 039 A2.04

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK 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: _____ PLANT SITE: _____ LAB: _____

TESTING METHOD: SIMULATE: _____ PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 5 MINUTES

REFERENCE(S): 1202.003 Chg. 005-01-0

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: _____

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-EOP16

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 reactor is tripped and the plant is in an over-cooling event at this time.

TASK STANDARD: "B" MSIV closed.

TASK PERFORMANCE AIDS: Step 19 from 1202.003.

SIMULATOR SETUP: 100% power, fail turbine bypass valves CV-6687 and CV-6688 100% open then trip the reactor and reduce letdown.

TUOI NUMBER: A1JPM-RO-EOP16

INITIATING CUE:

The SM/CRS directs you to check turbine bypass valves closed per step 19 of the Overcooling EOP.

CRITICAL ELEMENTS (C): 2, 3

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Check turbine bypass valves closed. FAULTED CUE: CV-6687 and CV-6688 are 100% open.	Identified that CV-6687 and CV-6688 are full open (by valve position indication on panel C03).	_____	_____	_____
(C)	2. Place turbine bypass valve hand/auto station for "B" OTSG in HAND and close. POSITIVE CUE: "B" turbine bypass valve controller in HAND but valves NOT responding.	On panel C03, placed turbine bypass valve hand/auto station for "B" OTSG in HAND and attempted to close CV-6687 and CV-6688.	_____	_____	_____
EXAMINER NOTE: Inform examinee that an operator has been dispatched to locally close TBVs and reports they can NOT be closed locally.					
(C)	3. Close "B" OTSG MSIV CV-2692. POSITIVE CUE: Green light ON, red light OFF for CV-2692.	On panel C09, closed "B" OTSG MSIV CV-2692.	_____	_____	_____
	4. Open Feedwater Pumps Discharge Crosstie CV-2827. POSITIVE CUE: Red light ON, green light OFF for CV-2827.	On panel C03, opened CV-2827.	_____	_____	_____
	5. Trip the "A" main feedwater pump. POSITIVE CUE: "A" MFP is tripped.	On panel C02, tripped the "A" main feedwater pump.	_____	_____	_____

TUOI NUMBER: A1JPM-RO-EOP16

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	6. Operate ATM Dump Control System for "B" OTSG to stabilize RCS temperature. POSITIVE CUE: RCS temperature is stable.	On panel C09, adjusted the "B" OTSG atmospheric dump control system (CV-2618 & CV-2619) to stabilize RCS temperature (as necessary).	_____	_____	_____
EOP will now send examinee to step 25 since the overcooling is terminated.					

END

TUOI NUMBER: A1JPM-RO-EOP16

INITIAL TASK CONDITIONS:

The reactor is tripped and the plant is in an over-cooling event at this time.

INITIATING CUE:

The SM/CRS directs you to check turbine bypass valves closed per step 19 of the Overcooling EOP.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **OVERCOOLING**	DOCUMENT NO. **1202.003**	CHANGE NO. **005-01-0**
	WORK PLAN EXP. DATE **N/A**	TC EXP. DATE **N/A**
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	Effective Communication
Distraction/Interruption	Questioning Attitude
Multiple Tasks	Placekeeping
Over Confidence	Self Check
Vague or Interpretive Guidance	Peer Check
First Shift/Last Shift	Knowledge
Peer Pressure	Procedures
Change/Off Normal	Job Briefing
Physical Environment	Coaching
Mental Stress (Home or Work)	Turnover

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	1000.006A	050-00-0

INSTRUCTIONS	CONTINGENCY ACTIONS
18. Check ATM Dump ISOL valves closed (CV-2619 and 2676).	18. Perform the following: A. **IF** associated ATM Dump Control System is being used to control SG press, **THEN** verify proper control: SG A: CV-2676, CV-2668 / ATM Dump ISOL, ATM Dump CNTRL / SG B: CV-2619, CV-2618 B. **IF** associated ATM Dump Control System is **not** being used to control SG press, **THEN** close ATM Dump ISOL valve: SG A: CV-2676, CV-2668 / ATM Dump ISOL, ATM Dump CNTRL / SG B: CV-2619, CV-2618
19. Check TURB BYP valves closed.	19. Place TURB BYP valve H/A Station in HAND **AND** close. A. **IF** TURB BYP valve fails to close, **THEN** dispatch an operator to close failed TURB BYP valve locally, while continuing with this procedure.

(19. CONTINUED ON NEXT PAGE)

INSTRUCTIONS

19. (Continued).

CONTINGENCY ACTIONS

B. **IF** associated SG press drops below 700 psig
OR
TURB BYP valve cannot be closed locally,
THEN perform the following:

1) Close associated MSIV:

SG A		SG B
CV-2691	MSIV	CV-2692
CV-6689 CV-6690	TURB BYP valves	CV-6687 CV-6688

2) **IF** MFW pumps are operating,
THEN perform the following:

a) Open Feedwater Pumps DISCH Crosstie (CV-2827).

(1) **IF** CV-2827 fails to open,
THEN actuate EFW **AND** verify proper actuation and control (RT 5).

b) Trip associated MFW pump:

SG A	SG B
CV-2691	CV-2692
B MFW pump	A MFW pump

c) **IF** both MFW pumps are tripped,
THEN actuate EFW **AND** verify proper actuation and control (RT 5).

3) Operate ATM Dump Control System for bad SG to stabilize RCS temp:

SG A		SG B
CV-2676	ATM Dump ISOL	CV-2619
CV-2668	ATM Dump CNTRL	CV-2618

4) **IF** overcooling is terminated,
THEN GO TO step 25.

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 1 Date: _____

TUOI NUMBER: A1JPM-RO-HYD03

System/Duty Area: Hydrogen Recombiner and Purge Control System

Task: Place Hydrogen Recombiner M55B in Operation

JA# ANO1-RO-RBH2-NORM-1

KA Value RO 4.0 SRO 4.0 KA Reference 028 A4.01

Approved 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: 15 Minutes

Reference(s): 1104.031 Chg. 014-03-0

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-HYD03

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 LOCA has occurred. Containment hydrogen concentration is 2.5%. Both hydrogen recombiners are shutdown. Containment pressure is 26.0 psia. Pre-LOCA containment temperature was 120°F.

TASK STANDARD:

Hydrogen recombiner M55B in operation at power setting of 68.0 KW to 70`.0 KW on JI-1001.

TASK PERFORMANCE AIDS:

1104.031, section 8.0 and Att. B

TUOI NUMBER: A1JPM-RO-HYD03

INITIATING CUE: The CRS/SM directs you to place both hydrogen recombiners (M55A/B) in standby and then place M55B in operation.
Note: Your task is complete when the power you have determined for recombiner operation is achieved.

CRITICAL ELEMENTS (c): 2, 4, 5, 6, 7, 8

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	1. Verify power adjust potentiometers are set at zero. POSITIVE CUE: Power adjust potentiometers for M55A/B are set at zero on C26.	Verified power adjust potentiometers set to zero on C26 (if not already at zero used knurled knob on power adjust potentiometers on C26 and turned to the left and set at zero using HS-7472 and HS-7473).	____	____	____
C	2. Turn hydrogen recombiners M55A and M55B on. POSITIVE CUE: M55A/B red lights ON. NEGATIVE CUE: M55A/B green lights ON.	Turned on hydrogen recombiners M55A and M55B using HS-7470 and HS-7471 on C26.	____	____	____
	3. Select thermocouple #1, 2 or 3 to input to recombiner temperature indicators TI-2300 and TI-2301. POSITIVE CUE: Thermocouple #1, 2 or 3 selected as desired to input to TI-2300 and TI-2301.	Thermocouple #1, 2 or 3 selected to input to TI-2300 and TI-2301 using handswitches HS-7474 and HS-7475 on C26.	____	____	____
C	4. Increase power to ~5 KW. POSITIVE CUE: Power on JI-1000 and JI-1001 indicates 5KW.	Slowly adjusted potentiometers clockwise until power on JI-1000 and JI-1001 on C26 indicated ~5 KW.	____	____	____
INSTRUCTOR NOTE: Inform examinee that ten minutes have elapsed after one minute at 10 KW.					
C	5. Slowly increase power to 10 KW and record initial time. POSITIVE CUE: Power is at 10 KW on JI-1000 and JI-1001.	Increased power to ~10 KW using power adjust potentiometers on C26. Recorded time 10 KW was achieved.	____	____	____
INSTRUCTOR NOTE: • Inform examinee that taking data every 30 minutes on Attachment E will be simulated. • Inform examinee that ten minutes have elapsed after achieving 10 KW. • Inform examinee that five minutes have elapsed after one minute at 20 KW.					
C	6. Slowly increase power to 20 KW on M55B and hold for 5 minutes. POSITIVE CUE: Power at 20 KW on JI-1001.	Increased power on M55B to ~20 KW using power adjust potentiometer on C26.	____	____	____

TUOI NUMBER: A1JPM-RO-HYD03

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
C	7. Determine power required from Attachment B based on containment pressure (26.0 psia and 120°F Pre-LOCA containment temperature).	Determined Recombiner power to be from **68.0 to 70.0** KW using Attachment B of 1104.031.	____	____	____
C	8. Slowly increase power to 68.0-70.0 KW range. POSITIVE CUE: Hydrogen concentration dropping on QI-7459 and M55B maintaining power at determined value. NEGATIVE CUE: Hydrogen concentration rising or steady on QI-7459.	Power increased to 68.0 to 70.0 KW range using power adjust potentiometer on C26.	____	____	____

END

TUOI NUMBER: A1JPM-RO-HYD03

INITIAL CONDITIONS:

- A LOCA has occurred.
- Containment hydrogen concentration is 2.5%.
- Both hydrogen recombiners are shutdown.
- Containment pressure is 26.0 psia.
- Pre-LOCA containment temperature was 120°F.

INITIATING CUE:

The CRS/SM directs you to place both hydrogen recombiners (M55A/B) in standby and then place M55B in operation.
Note: Your task is complete when the power you have determined for recombiner operation is achieved.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **CONTAINMENT HYDROGEN CONTROL**	DOCUMENT NO. **1104.031**	CHANGE NO. **014-03-0**
	WORK PLAN EXP. DATE **N/A**	TC EXP. DATE **N/A**
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	Effective Communication
Distraction/Interruption	Questioning Attitude
Multiple Tasks	Placekeeping
Over Confidence	Self Check
Vague or Interpretive Guidance	Peer Check
First Shift/Last Shift	Knowledge
Peer Pressure	Procedures
Change/Off Normal	Job Briefing
Physical Environment	Coaching
Mental Stress (Home or Work)	Turnover

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	**1000.006A**	**050-00-0**

CAUTION

Hydrogen recombiners should be placed in operation following a LOCA as soon as time permits and must be in operation before hydrogen concentration reaches 3.0%.

8.0 Placing Hydrogen Recombiner (M55A or M55B) in Operation

NOTE

Both M55A and M55B are placed in standby, then either may be placed in operation.

8.1 Place both M55A and M55B in standby as follows.

8.1.1 Place M55A in standby by performing the following:

A. Verify Power Adjust Potentiometer is set at zero for M55A.

B. Start M55A by placing HS-7470 in ON.

C. Select thermocouple #1, 2, or 3 (HS-7474) to input to M55A Temperature (TI-2300).

D. Slowly turn power adjust potentiometers clockwise to raise power to 5 KW as indicated on M55A Power (JI-1000).

E. Slowly raise power to 10 KW.

1. Record initial time at 10 KW: _____

2. Maintain 10 KW output for standby service.

8.1.2 Place M55B in standby by performing the following:

A. Verify Power Adjust Potentiometer is set at zero for M55B.

B. Start M55B by placing HS-7471 in ON.

C. Select thermocouple #1, 2, or 3 (HS-7475) to input to M55B Temperature (TI-2301).

D. Slowly turn power adjust potentiometers clockwise to raise power to 5 KW as indicated on M55B Power (JI-1001).

E. Slowly raise power to 10 KW.

1. Record initial time at 10 KW: _____

2. Maintain 10 KW output for standby service.

NOTE

Following a LOCA, M55A or M55B must be in operation before H_2 concentration reaches 3.0% as indicated on the highest reading H_2 analyzer.

8.2 Place recombiners in operation as follows:

8.2.1 Place M55A in service by performing the following:

A. During heatup, monitor and record all three thermocouple temperatures every 30 minutes on Attachment D.

B. Verify M55A has been at 10 KW for at least 10 minutes.

C. Slowly raise power to 20 KW AND hold for 5 minutes.

D. Determine power required from Recombiner Power (M-55A) Versus Containment Pressure (Attachment B of this procedure) based on containment pressure.

1) KW setting _____

CAUTION

Excessive power and temperature may cause heater failure.

2) Slowly raise power to the value determined above.

E. Verify proper recombiner operation by observing the following:

NOTE

- Hydrogen concentration reduction is the long-term, primary method of verification.
- H_2 concentration reduction shall be used regardless of recombiner power or temperature indication as the verification of proper recombiner operation.

- Hydrogen concentration stable or dropping at % Hydrogen (QI-7457 and QI-7459).
- Recombiner maintaining power at value determined

NOTE

- Thermocouples are non-Q and will not be reliable indicators in a post-LOCA environment.
- Recombiner temperature can aid in trending recombiner operation. The following steps are provided as guidelines.
- Recombiner temperature may be plotted on Attachment C for verifying thermocouple operation and estimating time when recombination temperature will be reached.

F. Establish validity of temperature indication by comparing ΔT between thermocouples.

1. IF all three thermocouples fall within a 60°F band,
   THEN average the three temperatures.

2. IF no two thermocouples are within 60°F of each other,
   THEN thermocouples should be considered inaccurate.

3. IF difference of the three temperatures >60°F,
   AND two temperatures are within 60°F,
   THEN average the closest two.

G. Monitor for indication that recombiner operating temperature of 1225°F has been reached.

NOTE

Valid thermocouples show a ramp rise in temperature with H_2 concentration $\geq$2%, indicating recombination temperature has been reached and recombination is taking place.

H. IF hydrogen concentration is $\geq$2%,
   THEN monitor for a ramp rise in temperature.

I. After four hours of full power operation, log data in Attachment D once per hour.

8.2.2 Place M55B in service by performing the following:

A. During heatup, monitor and record all three thermocouple temperatures every 30 minutes on Attachment E.

B. Verify M55B has been at 10 KW for at least 10 minutes.

C. Slowly raise power to 20 KW AND hold for 5 minutes.

D. Determine power required from Recombiner Power (M-55B) Versus Containment Pressure (Attachment B of this procedure) based on containment pressure.

1) KW setting _____

CAUTION

Excessive power and temperature may cause heater failure.

2) Slowly raise power to the value determined above.

E. Verify proper recombiner operation by observing the following:

NOTE

- Hydrogen concentration reduction is the long-term, primary method of verification.
- H_2 concentration reduction shall be used regardless of recombiner power or temperature indication as the verification of proper recombiner operation.

- Hydrogen concentration stable or dropping at % Hydrogen (QI-7457 and QI-7459).
- Recombiner maintaining power at value determined

NOTE

- Thermocouples are non-Q and will not be reliable indicators in a post-LOCA environment.
- Recombiner temperature can aid in trending recombiner operation. The following steps are provided as guidelines.
- Recombiner temperature may be plotted on Attachment C for verifying thermocouple operation and estimating time when recombination temperature will be reached.

F. Establish validity of temperature indication by comparing ΔT between thermocouples.

1. IF all three thermocouples fall within a 60°F band,
   THEN average the three temperatures.

2. IF no two thermocouples are within 60°F of each other,
   THEN thermocouples should be considered inaccurate.

3. IF difference of the three temperatures >60°F,
   AND two temperatures are within 60°F,
   THEN average the closest two.

G. Monitor for indication that recombiner operating temperature of 1225°F has been reached.

NOTE

Valid thermocouples show a ramp rise in temperature with H_2 concentration $\geq$2%, indicating recombination temperature has been reached and recombination is taking place.

H. IF hydrogen concentration is $\geq$2%,
   THEN monitor for a ramp rise in temperature.

I. After four hours of full power operation, log data in Attachment E once per hour.

8.2.3 IF proper power setting causes average valid temperature to exceed 1450°F
OR in-service recombiner has insufficient capacity,
THEN place standby recombiner in service.

8.2.4 Do NOT lower recombiner power based on extreme temperature. Maintain power until standby recombiner is heated to operating temperature.

8.3 Monitor Hydrogen Samplers (C178 and C179) to verify recombiner(s) maintaining or lowering hydrogen concentration.

CAUTION

Excessive power and temperature may cause heater failure.

NOTE

A power change of 4 KW will change temperature approximately 75°F

8.3.1 IF H_2 concentration has risen by >0.5% in 24 hours
OR H_2 concentration >3.0%,
THEN raise recombiner power setting by 4 KW above the previous setting.

NOTE

A change in containment pressure will require an adjustment to recombiner power.

8.4 Monitor containment pressure.

8.4.1 WHEN pressure changes,
THEN adjust recombiner power to new value from Attachment B.

8.5 WHEN no longer required,
THEN secure Hydrogen Recombiner as follows:

8.5.1 Secure M55A as follows:

A. Lower power to zero.

B. Secure M55A by placing HS-7470 to OFF.

C. Leave a thermocouple selected as input to M55A Temperature (TI-2300).

8.5.2 Secure M55B as follows:

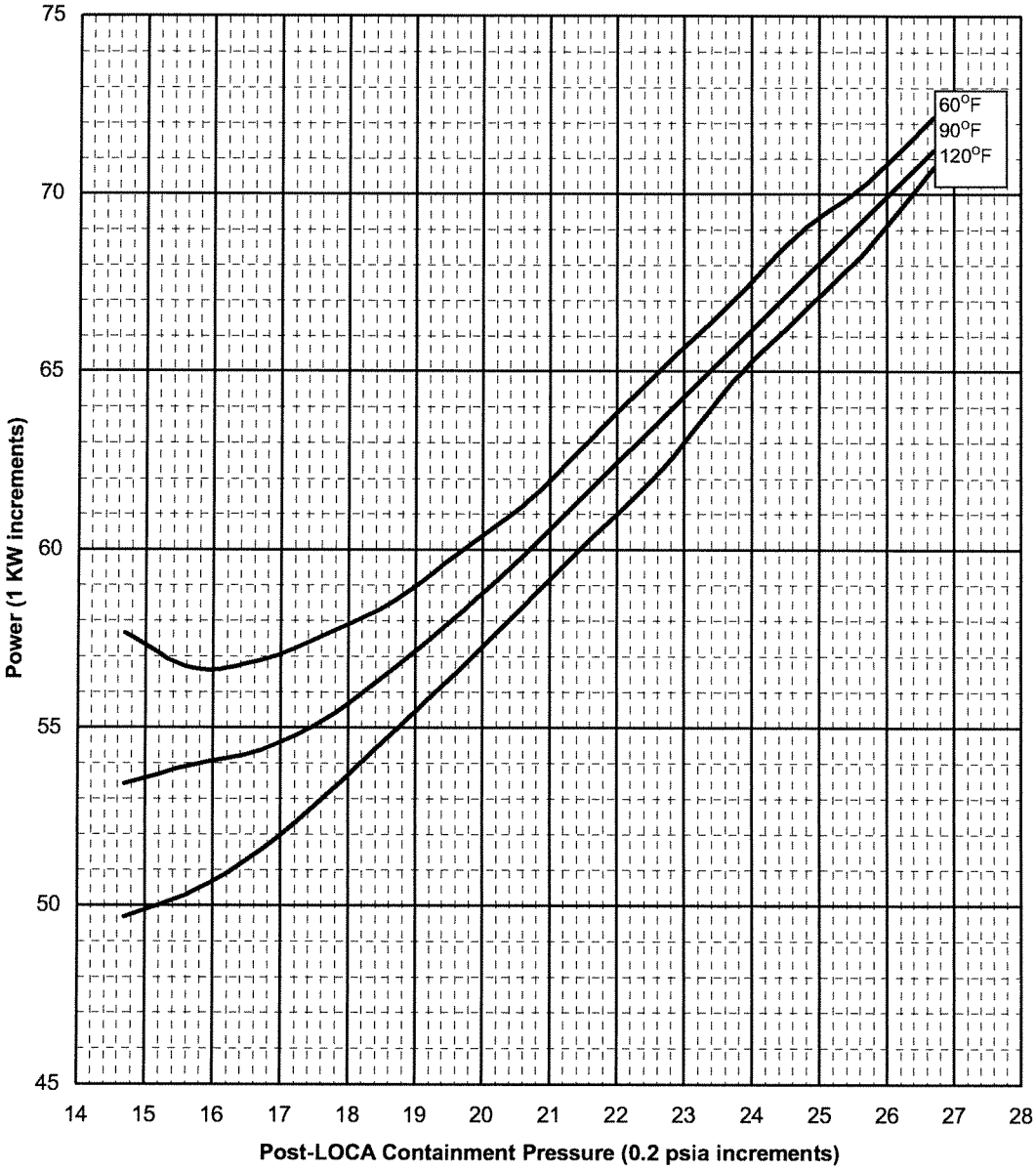
A. Lower power to zero.

B. Secure M55B by placing HS-7471 to OFF.

C. Leave a thermocouple selected as input to M55B Temperature (TI-2301).

ATTACHMENT B

RECOMBINER POWER (M-55B) VERSUS CONTAINMENT PRESSURE



Note: Use pre- LOCA average Reactor Building Temperature from SPDS (TAVRB1) from history file if available. Otherwise use logs.

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 4 Date: _____

TUOI NUMBER: A1JPM-RO-ED008

System/Duty Area: Electrical Distribution

Task: Shift buses A1, A2, H1, H2 from Startup One to Unit Aux Transformer

JA# ANO1-RO-ELECD-NORM-25

KA Value RO 3.1 SRO 3.1 KA Reference 062 A4.07

Approved 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): 1107.001 Chg. 060-19-0

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-ED008

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:

Plant is at 20-40% power and ready to transfer plant auxiliaries to the Unit Aux Transformer. The Unit Auxiliary Transformer is available and all breaker controls are in Remote." **SEE SETUP BELOW.**

TASK STANDARD:

Plant auxiliaries (A1, A2, H1, H2) are being powered from the Unit Auxiliary Transformer. ***This is a faulted JPM, the operator must manually trip one of the power supplies to A1 bus.***

TASK PERFORMANCE AIDS:

Synch-switch handle, 1107.001 Step 8.2

Simulator setup:

The faulted breaker for this JPM will be implemented by use of an override. Prior to providing the initial conditions for this JPM insert the following:

Override DI-A112R;False

This will cause the SU1 feeder breaker to bus A1 to fail to open when the Unit Aux feeder handswitch is released after being closed (the override defeats the return-to-normal for breaker A-112, Unit Aux to A1).

TUOI NUMBER: A1JPM-RO-ED008

INITIATING CUE: The CRS/SM directs you to transfer plant auxiliaries from Startup One Transformer to the Unit Auxiliary Transformer.

CRITICAL ELEMENTS (c): 1, 3, 6

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
INSTRUCTOR NOTE: This is a faulted JPM, the Startup One to A1 breaker will not automatically open after the Unit Aux to A1 breaker is closed, the operator must manually trip one of the feeder breakers to A1.					
C	1. On C10, place Synchronize switch to ON for the Unit Aux Feeder Breaker that is to be closed. POSITIVE CUE: Synchronize switch ON.	Turned ON Synchronize switch for correct breaker.	___	___	___
	2. Verify synchroscope is at 12 o'clock.	Verified sycnhroscope stopped near the 12 o'clock position.	___	___	___
C	3. On C10, close Unit Aux Feeder breaker. Allow control switch to return to normal-after-close position. POSITIVE CUE: Unit Aux Feeder Breaker closed.	Closed Unit Aux Feeder Breaker and allowed control switch to return to normal-after-close position.	___	___	___
	4. On C10, turn Synchronize switch OFF. POSITIVE CUE: Synchronize switch OFF.	Turned Synchronize switch OFF.	___	___	___
	5. On C10, verify that the SU1 Feeder Breaker opens. POSITIVE CUE: SU1 feeder breaker opened. NEGATIVE CUE: A1 SU1 breaker did not open, Unit Aux and SU1 feeder breakers to A1 are closed.	Verified that the SU1 Feeder Breaker Opened.	___	___	___
C	6. If the SU1 breaker does not immediately open, trip it. POSITIVE CUE: SU1 to A1 breaker is open.	Tripped (to open) the SU1 feeder breaker to A1 bus (A-113).	___	___	___
	7. Place the open breaker's control switch in normal-after-open.	Placed the open breaker's control switch in the normal-after-open position.			
	8. Verify Startup XFMRS Pref Transfer selector switch is in the desired position.	Verified Startup XFMRS Pref Transfer selector switch is in the desired position (to SU1).			

TUOI NUMBER: A1JPM-RO-ED008

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	9. Verify 4160V buses remain above 3640V and 6900V buses remain above 6010V.	Verified proper voltages on A1, A2, H1 and H2.			
	10. Contact relay group to perform visual verification of contact closure of Sync Check Relays.	Contacted relay group.			

END

TUOI NUMBER: A1JPM-RO-ED008

INITIAL CONDITIONS:

- Plant is at 20-40% power and ready to transfer plant auxiliaries to the Unit Aux Transformer.
- The Unit Auxiliary Transformer is available and all breaker controls are in "Remote."

INITIATING CUE:

The CRS/SM directs you to transfer plant auxiliaries from Startup One Transformer to the Unit Auxiliary Transformer.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **ELECTRICAL SYSTEM OPERATIONS**	DOCUMENT NO. **1107.001**	CHANGE NO. **060-19-0**
	WORK PLAN EXP. DATE **N/A**	TC EXP. DATE **N/A**
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☒YES ☐NO
	TEMP ALT ☒YES ☐NO	

When you see these *TRAPS*	**Get these *TOOLS***
Time Pressure	**Effective Communication**
Distraction/Interruption	**Questioning Attitude**
Multiple Tasks	**Placekeeping**
Over Confidence	**Self Check**
Vague or Interpretive Guidance	**Peer Check**
First Shift/Last Shift	**Knowledge**
Peer Pressure	**Procedures**
Change/Off Normal	**Job Briefing**
Physical Environment	**Coaching**
Mental Stress (Home or Work)	**Turnover**

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	**1000.006A**	**050-00-0**

8.1.4 IF RCS is ≤200°F
AND it is desired to remove SU 2 Transformer Feeder Breakers to A2, H1, H2 control switches from PULL-TO-LOCK,
THEN perform the following:

NOTE

- Lamps for Load Shed circuits only indicate power available to the circuit. Test switches for defeating this feature do not cause the lamps to go out.
- SU2 Load Shed feature is defeated by opening Switch G located beneath the cover of TS-1 111 Test SW and TS-1 211 Test SW, at A-111 and A-211, respectively. The switch cover cannot be installed with Switch G open.

A. SU 2 Transformer load shed circuit operable as follows:

- Lamp on at Startup XFMR #2 Feed to A1 (A-111) illuminated.
- Lamp on at Startup XFMR #2 Feed to H1 (H-13) illuminated.
- Cover installed on TS-1 111 Test SW at A-111.
- Cover installed on TS-1 211 Test SW at A-211.

B. UNLESS allowed by Design Engineering Evaluation, verify Unit 2 has SU 2 Transformer feeder breakers in PULL-TO-LOCK.

C. Inform Unit 2 of intent to remove Unit 1 feeder breakers from SU 2 from PULL-TO-LOCK.

D. Remove SU 2 feeder breakers to A2, H1, and H2 as desired from PULL-TO-LOCK.

8.1.5 To transfer loads to SU 2 perform the appropriate section of this procedure.

8.2 Transferring Buses From SU 1 to Unit Aux

8.2.1 Verify breakers to be operated are in the remote position.

8.2.2 Verify Unit Aux Transformer is operable.

8.2.3 For Unit Aux Feeder Breaker that is to be closed, turn Synchronize switch on.

8.2.4 Verify synchroscope between 11 and 1 o'clock.

{4.3.4}

CAUTION

High circulating currents may trip bus lockout relay if both feeder breakers remain closed.

8.2.5 Close Unit Aux Feeder breaker. Allow control switch to return to NORMAL-AFTER-CLOSE position.

NOTE

Synchronize switch must be off to verify feeder breaker opens. With Synchronize switch on, red light for feeder breaker position goes out even if breaker does not trip.

8.2.6 Turn Synchronize switch off.

8.2.7 Verify that the SU 1 Feeder Breaker opens.

A. IF the SU 1 breaker does NOT immediately open, THEN trip it.

{4.3.4}

B. IF the SU 1 breaker will NOT trip,
THEN reopen the Unit Aux Feeder breaker
AND delay power escalation until the problem is resolved.

1. IF neither SU 1 breaker nor Unit Aux breaker will open,
THEN dispatch an operator to manually trip the Unit Aux Feeder breaker
AND delay power escalation until the problem is resolved.

2. Initiate maintenance action for repairs.

8.2.8 Place the open breaker's control switch in NORMAL-AFTER-OPEN.

8.2.9 Repeat steps until all buses are on Unit Aux.

8.2.10 Verify Startup XFMRS Pref Transfer selector switch is in the desired position.

8.2.11 Verify 4160V buses remain above 3640V and 6900V buses remain above 6010V.

8.2.12 Contact Relay Group to perform visual verification of contact closure of Sync Check Relays.

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 0 Date: _____

TUOI NUMBER: A1JPM-RO-ARM01

System/Duty Area: Area Radiation Monitor System

Task: Respond to Area Radiation Monitor alarm

JA# ANO1-WCO-RMS-SURV-7

KA Value RO 3.0 SRO 3.3 KA Reference 072 A4.01

Approved 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: 20 Minutes

Reference(s): 1305.001 Chg. 014-15-0

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-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:

1305.001, supplement 6

TUOI NUMBER: A1JPM-RO-ARM01

INITIATING CUE: The CRS directs you to adjust the warning setpoint for RI-8006 to 2.0 mR/hr.

CRITICAL ELEMENTS (c): 2, 3, 6, 9

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EXAMINER NOTE: When trainee places alarm setting switch in the WARNING position, then inform trainee the 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.	____	____	____
EXAMINER NOTE: Inform trainee RI-8006 indicator is reading 1.5 mR/hr background.					
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. POSITIVE CUE: Warning potentiometer set to 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 int. POSITIVE CUE: RI-8006 drawer inserted.	On RI-8006, slid drawer in.	____	____	____
	5. Reset Warning alarm. POSITIVE CUE: Warning alarm clear.	On RI-8006, turned ALARM RESET/CHECK SOURCE switch to ALARM RESET.	____	____	____
C	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 places alarm setting switch in the HIGH position, then inform trainee the indicator is reading 4 mR/hr.					

TUOI NUMBER: A1JPM-RO-ARM01

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	7. On RI-8006, place alarm setting switch in the HIGH position and observe high alarm setpoint value on indicator. POSITIVE CUE: RI-8006 alarm setting switch in high.	On C25 Bay 3, placed RI-8006 alarm setting switch in HIGH. Observed high setpoint value.	____	____	____
EXAMINER NOTE: Inform trainee that no adjustment is necessary for the HIGH setpoint.					
	8. Record as-left setpoint value in section 3.0.	In section 3.0, recorded value of 4.0 mR/hr for the high as-left setpoint for RI-8006.	____	____	____
C	9. Adjust area monitor setpoint in plant computer. POSITIVE CUE: RI-8006 warning setpoint in PMS adjusted to 2.0 mR/hr.	Using DBM function in plant computer, adjusted RI-8006 warning setpoint to 2.0 mR/hr.	____	____	____

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.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **RADIATION MONITORING SYSTEM CHECK AND TEST**	DOCUMENT NO. **1305.001**	CHANGE NO. **014-15-0**
	WORK PLAN EXP. DATE **N/A**	TC EXP. DATE **N/A**
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	Effective Communication
Distraction/Interruption	Questioning Attitude
Multiple Tasks	Placekeeping
Over Confidence	Self Check
Vague or Interpretive Guidance	Peer Check
First Shift/Last Shift	Knowledge
Peer Pressure	Procedures
Change/Off Normal	Job Briefing
Physical Environment	Coaching
Mental Stress (Home or Work)	Turnover

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	**1000.006A**	**050-00-0**

SUPPLEMENT 6

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

INITIALS

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.

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. _____

D. Slide Area Monitor drawer out to gain access to Alarm Setting potentiometers. _____

{4.3.3}

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 One 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 Use DBM function of PMS computer, adjust Area Monitor RI-8001 alarm setpoint to be in accordance with as-left data of this supplement. _____

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. _____

A. Slide Area Monitor drawer out to gain access to Alarm Setting potentiometers.

B. While holding the Alarm Setting switch in the WARNING position, adjust the warning potentiometer to the desired setpoint.

C. Slide Area Monitor drawer back to the normal position and secure.

D. 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. _____

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 Record As-Left Setpoint in section 3.0. _____

2.3.7 Use "DBM" function of PMS computer, adjust 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. Otherwise, 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. _____

SUPPLEMENT 6

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. Otherwise, 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 $\geq$1.2 and High setpoint at $\leq$1.8. _____

Note 1	**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:** $\frac{5 \times 10^3 \text{ mR}}{(30 \text{ days})(24 \text{ hr/day})} \cong 7 \text{ mR/HR}$
Note 2	**This is based on the design value for this area during normal operation (assuming 1% failed fuel) according to ANO-1 SAR.**
Note 3	During refueling shutdown, set the alarm sufficiently above the background reading to minimize constant alarming. If alarm setpoint must exceed 100 mR/HR, ensure HP is notified and the area properly posted.
Note 4	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 5	Based upon 1MPC XE-133. (Calc 91-E-0067-01)

{4.3.1} {4.3.2}

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
RI-8001 CONTROL ROOM	**1 mR/HR**		**1 mR/HR (2)**	**YES NO**		**7 mR/HR (1)**	**YES NO**

{4.3.1} {4.3.3}

NOTE: NUMBERS IN PARENTHESES REFER TO NOTES AT TOP OF THIS PAGE.

(continued next page)

SUPPLEMENT 6

3.0 (Continued)

	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
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 EL 317'	1 mR/HR		10 mR/HR	YES NO		20 mR/HR	YES NO
RI-8005 SAMPLE RM VESTIBULE	1 mR/HR		2.5 mR/HR	YES NO		7.5 mR/HR	YES NO
RI-8006 RADIOCHEM. LAB	1 mR/HR		2.5 mR/HR	YES NO		7.5 mR/HR	YES NO
RI-8007 OUTSIDE STAIRWAY EL 369'	1 mR/HR		2.5 mR/HR	YES NO		7.5 mR/HR	YES NO
RI-8008 DECON RM EL 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 EL 386'	1 mR/HR		1 mR/HR (2)	YES NO		2.5 mR/HR	YES NO
RI-8011 OUTSIDE STAIRWAY EL 335'	1 mR/HR		10 mR/HR	YES NO		20 mR/HR	YES NO

NOTE: NUMBERS IN PARENTHESES REFER TO NOTES ON PAGE 7 OF THIS SUPPLEMENT.

(continued next page)

SUPPLEMENT 6

	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
RI-8012 PIPING AREA I BY ELEV EL 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
RI-8016 SPENT FUEL FILTERS AREA	1 mR/HR		48 mR/HR	YES NO		72 mR/HR	YES NO
RI-8017 FUEL HANDLING EQUIPMENT	.04 R/HR		*.3 R/HR ** Variable	YES NO		*.45 R/HR ** Variable (3)	YES NO
RI-8018 PERSONNEL ACCESS HATCH	.04 R/HR		.04 R/HR	YES NO		.06 R/HR	YES NO
RI-8019 INCORE INSTRUMENT TANK	.04 R/HR		*1.2 R/HR ** Variable (4)	YES NO		*1.8 R/HR ** Variable (3)	YES NO

* Reactor critical ** Reactor shut down

NOTE: NUMBERS IN PARENTHESES REFER TO NOTES ON PAGE 7 OF THIS SUPPLEMENT.

(continued next page)

SUPPLEMENT 6

	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
RI-8020 EQUIPMENT HATCH	.04 R/HR		*.08 R/HR ** Variable (4)	YES NO		*.12 R/HR ** Variable (3)	YES NO
2RITS-8001A High Alarm Setpoint	N/A	N/A	N/A	N/A		800 CPM (5)	YES NO
2RITS-8001B High Alarm Setpoint	N/A	N/A	N/A	N/A		800 CPM (5)	YES NO

NOTE: NUMBERS IN PARENTHESES REFER TO NOTES ON PAGE 7 OF THIS SUPPLEMENT.

3.2 IF "No" is circled in the above table, 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 _____

SUPPLEMENT 6

4.0 SHIFT MANAGER REVIEW AND ANALYSIS

(circle one)

4.1 Are the As-Left Setpoints within the Maximum Normal Setpoints?..... YES NO

4.2 Do the As-Left High Alarm Setpoints fall within the Maximum High Alarm Setpoints? ..... YES NO

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

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

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

SHIFT MANAGER _____ DATE _____

JOB PERFORMANCE MEASURE

TUOI NUMBER: A1JPM-RO-AOP28

UNIT: 1 REV #: 2 DATE: _____

TUOI NUMBER: A1JPM-RO-AOP28

SYSTEM: Emergency and Abnormal Operations

TASK: Respond to Lo-Lo Instrument Air Pressure.

JTA ANO1-RO-AOP-OFFNORM-178

KA VALUE RO: 3.7 SRO: 3.9 KA REFERENCE: 065 AK3.08

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

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

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ SIMULATOR: X LAB: _____

POSITION EVALUATED: RO: _____ SRO: _____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: _____ LAB: _____

TESTING METHOD: SIMULATE: _____ PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 20 minutes

REFERENCE(S): 1203.024, Chg. 010-08-0

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: _____

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

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 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 290" and trending up.

TASK STANDARD: Rx Tripped, EFW in service, Seal Injection isolated, and RCP's secured with normal and alternate seal bleedoff flowpaths isolated.

TASK PERFORMANCE AIDS: 1203.024 Section 2.

JOB PERFORMANCE MEASURE

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.

CRITICAL ELEMENTS (C): 1, 2, 4, 5, 6, 7, 8

(C)	PERFORMANCE CHECKLIST	STANDARDS	N/A	SAT	UNSAT
(C)	1. Manually trip Reactor, verify all rods inserted and power dropping.	On C03, depressed the Rx Trip pushbutton. On C13, observed all rod bottom lights have come on. On C03 observed power dropping.	_____	_____	_____
(C)	2. Manually trip the turbine and verify all throttle and governor valves closed.	On C01, depressed the Turbine Trip pushbutton and verified all TVs and GVs closed.	_____	_____	_____
	3. Check adequate SCM.	On ICC display on C19 (or C04), verified that SCM is adequate.	_____	_____	_____
(C)	4. Actuate EFW for both OTSG's.	On C09, All 4 EFW push buttons pushed on EFIC remote matrix.	_____	_____	_____
(C)	5. Isolate Seal Injection by closing CV-1206.	On C04, placed HS-1206 in close position.	_____	_____	_____
(C)	6. Trip all running RCP's.	On C13 tripped All running RCP's. P-32A/P-32B/P-32C/P-32D.	_____	_____	_____
(C)	7. Isolate Alternate Seal Bleedoff flowpath to the Quench Tank.	On C13, placed SV-1270 thru SV-1273 handswitches in closed position.	_____	_____	_____
(C)	8. Isolate Normal Seal Bleedoff flowpath.	On C16, close CV-1274 or on C18 close CV-1270 thru CV-1273.	_____	_____	_____
	END				

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 290" 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.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **LOSS OF INSTRUMENT AIR**	DOCUMENT NO. **1203.024**	CHANGE NO. **010-08-0**
	WORK PLAN EXP. DATE **N/A**	TC EXP. DATE **N/A**
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	Effective Communication
Distraction/Interruption	Questioning Attitude
Multiple Tasks	Placekeeping
Over Confidence	Self Check
Vague or Interpretive Guidance	Peer Check
First Shift/Last Shift	Knowledge
Peer Pressure	Procedures
Change/Off Normal	Job Briefing
Physical Environment	Coaching
Mental Stress (Home or Work)	Turnover

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	**1000.006A**	**050-00-0**

SECTION 2 -- LOW-LOW INSTRUMENT AIR PRESSURE (≤60 PSIG)

DISCUSSION

The air pressure in the IA line(s) nearest the leak will be lower than the indicated air header pressure. For this reason, components nearest the leak will exhibit abnormal indication and abnormal control characteristics first. The longer air pressure remains degraded, the greater the number of malfunctions.

If IA pressure continues to degrade, power reduction at the maximum rate is specified to minimize plant impact. Close monitoring of air operated systems and components is required to minimize transients resulting from failures. For additional discussion, see Attachment D.

1.0 SYMPTOMS

1.1 IA header pressure ≤60 psig.

2.0 IMMEDIATE ACTION

None.

3.0 FOLLOW-UP ACTIONS

3.1 Commence plant shutdown at ≥10% per minute per Rapid Plant Shutdown (1203.045) while continuing with this procedure.

3.1.1 IF instrument air pressure recovers (>60 psig), THEN stop plant shutdown.

3.2 IF IA header pressure drops below 35 psig, OR any system degrades to the extent that in the judgment of the operator requires reactor trip, THEN **GO TO** Section 3, "Loss of Instrument Air Pressure (≤35 PSIG)".

3.3 Place RCP Seal INJ Block (CV-1206) pushbutton in OVRD (OVRD light on).

NOTE

- Using HPI Block Valves CV-1220 or CV-1285 will minimize nozzle stress cycles because of the normal makeup path.
- Pressurizer Makeup Flow Control Valve (CV-1235) will fail as is, when IA pressure drops to ~45 psig.

3.4 IF necessary to maintain pressurizer level ≥100", THEN use HPI block valves to provide makeup to RCS, or take manual control of CV-1235 as follows:

3.4.1 Align stem and gear holes.

3.4.2 Install lock pin.

3.4.3 Open equalizing valve.

SECTION 2 -- LOW-LOW INSTRUMENT AIR PRESSURE (continued)

3.5 IF necessary to maintain pressurizer level <290",
AND ICW is available to RCP seal coolers,
THEN perform one or both of the following (3.5.1, 3.5.2) as required:

3.5.1 Isolate seal injection by closing RCP Seal INJ Block (CV-1206).

3.5.2 Perform the following:

A. Secure the operating makeup pump.

B. Verify letdown isolated.

C. Perform actions of Loss of Reactor Coolant Makeup (1203.026).

3.6 IF ICW is NOT available to RCP seal coolers,
AND pressurizer level reaches 290",
THEN perform the following:

3.6.1 Trip the reactor and perform Reactor Trip (1202.001) in conjunction with this procedure.

3.6.2 Fully actuate EFW to both SGs.

3.6.3 Close CV-1206.

3.6.4 Trip all running RCPs.

3.6.5 Place the following RCP Seals Bleedoff (Alternate Path to Quench Tank) in CLOSE:

- SV-1270
- SV-1271
- SV-1272
- SV-1273

3.6.6 Isolate RCP Seal Bleedoff (Normal) by closing either A or B below:

A. CV-1274, or

B. CV-1270
CV-1271
CV-1272
CV-1273

3.6.7 Refer to 1202.001 and continue with this procedure.

SECTION 2 -- LOW-LOW INSTRUMENT AIR PRESSURE (continued)

3.7 IF 2VSF-9 is out of service,
THEN direct Unit 2 to perform the following due to IA pressure no longer being sufficient for 2VSF-9 outside air damper operation:

3.7.1 Declare 2VSF-9 inoperable.

3.7.2 Place 2VSF-9 Outside Air Damper (2PCD-8607B) in RESERVE.

3.8 Continue with efforts to return IA pressure to normal as directed by Section 1, "Low Instrument Air Pressure (≤75 PSIG)".

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 0 Date: _____

TUOI NUMBER: A1JPM-RO-CA01

System/Duty Area: Chemical Addition System

Task: Borate via alternate path bypassing batch controller

JA# ANO1-RO-CA-NORM-2

KA Value RO 3.1 SRO 3.3 KA Reference 004 K6.13

Approved For Administration To: RO ☒ SRO ☒

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

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

Plant Site: Simulate Simulator#: _____ Lab: _____

Position Evaluated: RO: _____ SRO: _____

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

Testing Method: Simulate: _____ Perform: _____

Approximate Completion Time In Minutes: 20 Minutes

Reference(s): 1305.001, Chg. 017-04-0

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-CA01

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:

Plant is in process of cooling down for a refueling outage. Boration was in progress to establish refueling boron concentration when batch controller stopped functioning.

TASK STANDARD:

Boration of 200 gallons completed with batch controller bypassed.

TASK PERFORMANCE AIDS:

1103.004 section 9.0

TUOI NUMBER: A1JPM-RO-CA01

INITIATING CUE: The CRS directs you to bypass the batch controller per section 9.0 of 1103.004 and add 200 gallons of boric acid. This procedure section is complete through step 9.1.7.

CRITICAL ELEMENTS (c): 4, 6, 7, 8, 9

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EXAMINER NOTE: When trainee states the need for a local operator, then inform trainee an operator is available.					
	1. Station an operator at FI-1608 with communications with Control Room.	Stated the need to station an operator locally at MU Filter Flow Indicator, FI-1608.	____	____	____
EXAMINER NOTE: When trainee states the need to close CV-1251, then inform trainee valve is closed.					
	2. Close Condensate to Batch Controller CV-1251. POSITIVE CUE: CV-1251 closed.	Called Control Room and requested closure of CV-1251.	____	____	____
	3. Verify valves at BAAT closed. POSITIVE CUE: Valves are closed.	At BAAT, verified the following valves closed: • Boric Acid to SFP CA-78 • Boric Acid to BWST CA-76 • FI-1608 Bypass CA-1608-3.	____	____	____
EXAMINER NOTE: Step 9.2.4 is N/A.					
C	4. Unlock and close Boric Acid to Batch Controller, CA-73. POSITIVE CUE: Unlocked and closed CA-73.	Unlocked and closed Boric Acid to Batch Controller, CA-73. Mentioned need to make Cat-E log entry (not required for full credit).	____	____	____
	5. Verified CA-72 closed and CA-71 open. POSITIVE CUE: CA-72 closed, CA-71 open.	In "B" MU pump room, verified Boric Acid Line Flush to ABD Header CA-72 closed and Boric Acid to Makeup Filters CA-71 open.	____	____	____
C	6. Verify valves at BAAT open. POSITIVE CUE: Valves are closed.	At BAAT, verified the following valves open: • Boric Acid to MU Filters Root Isol CA-69 • FI-1608 Inlet CA-1608-1 • FI-1608 Outlet CA-1608-2	____	____	____

TUOI NUMBER: A1JPM-RO-CA01

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EXAMINER NOTE: Inform trainee to start P-39A and, after pump is running, inform trainee flow rate is 20 gpm.					
C	7. Start Boric Acid Pump, P-39A. POSITIVE CUE: P-39A red light ON.	At C101, started P-39A.	___	___	___
EXAMINER NOTE: After trainee calculates required run time, then inform trainee that the required run time has elapsed.					
C	8. Calculate volume addition. POSITIVE CUE: Trainee calculated 200 gallons.	Using a flow rate of 20 gpm, trainee calculated a run time of 10 minutes to achieve 200 gallons boric acid addition.	___	___	___
EXAMINER NOTE: After trainee stops pump, then inform trainee that the valve re-alignment is unnecessary and Att. B has been updated.					
C	9. Stop running boric acid pump. POSITIVE CUE: P-39A stopped.	At C101, stopped boric acid pump P-39A.	___	___	___

END

TUOI NUMBER: A1JPM-RO-CA01

INITIAL CONDITIONS:

- Plant is in process of cooling down for a refueling outage.
- Boration was in progress to establish refueling boron concentration when batch controller stopped functioning.

INITIATING CUE:

The CRS directs you to bypass the batch controller per section 9.0 of 1103.004 and add 200 gallons of boric acid. This procedure section is complete through step 9.1.7.

9.0 Boration - Alternate Method From BAAT, Bypassing Batch Controller:

9.1 Initial Conditions

9.1.1 Makeup and purification system in operation per Makeup & Purification System Operation (1104.002) "System Startup" section.

9.1.2 Chemical addition system aligned per Chemical Addition (1104.003), Attachment F.

9.1.3 IF manual bleed is to be initiated,
THEN verify the following:

A. Vacuum degasifier either bypassed or in-service per Vacuum Degasifier Operations (1104.016).

B. Clean liquid waste system in operation per Clean Waste System Operation (1104.020), "Initial Startup" section.

9.1.4 Sample RCS and boric acid source to determine boron concentration as needed.

NOTE

Simultaneous boric acid addition to the Makeup System using both batch controller and bypassing batch controller flow paths is permitted during RCS cooldown in Modes 3 and 4.

9.1.5 Unless during plant cooldown, verify no other transfer of boric acid from BAAT in progress.

NOTE

- When using the BORON program, any operating conditions may be input.
- Attachment C and the BORON program automatically add 167,000 lb. to the reactor coolant mass when RCS temperature is $\leq$ 250.0°F, to account for the decay heat system.

9.1.6 Perform the following calculations:

A. Use Attachment A.3 OR Plant Monitoring System BORON program to determine volume needed.

B. Record volume of batch to be added on Attachment B, RCS Liquid Addition Data Sheet.

C. Obtain an RO/SRO independent review of calculation and record on Attachment B.

D. IF needed,
THEN complete "BAAT Inventory Planning Sheet", Attachment A.10.

9.1.7 Ensure adequate storage availability exists for any waste to be generated, if applicable.

- Compare volume of feed calculated in above step vs. available T-12s.

- IF T-12s cannot receive required volume, THEN transfer applicable T-12s to Unit 2 per Clean Waste System Operation (1104.020).

NOTE

The following alignment retains the ability to borate to cold shutdown. For boric acid additions, other than boration to cold shutdown, an operator is required at MU Filter Flow IND (FI-1608) for flow monitoring.

9.2 Establish addition lineup as follows:

9.2.1 Station an operator at FI-1608 with communications with Control Room.

9.2.2 Close Condensate to Batch Controller (CV-1251).

9.2.3 Verify the following valves at the BAAT closed:

- Boric Acid to SF Pool (CA-78)
- Boric Acid to BWST (CA-76)
- FI-1608 Bypass (CA-1608-3)

NOTE

Alignment for simultaneous addition through batch controller and batch controller bypass should not be used except during RCS cooldown in Mode 3 or Mode 4.

9.2.4 IF this lineup is for simultaneous addition through batch controller AND batch controller bypass during RCS cooldown, THEN verify Boric Acid to Batch Controller (CA-73) open.

9.2.5 IF lineup is for any other activity, THEN unlock and close CA-73.

A. Make appropriate entry in Category E/Locked Component Log (E-DOC 1015.001H).

9.2.6 Verify the following valves in the 'B' MU pump room:

- Boric Acid Line Flush to ABD Header (CA-72) closed.
- Boric Acid to Makeup Filters Isol (CA-71) open.

9.2.7 Verify the following valves open at the BAAT:

- Boric Acid to MU Filters Root Isol (CA-69)
- FI-1608 Inlet (CA-1608-1)
- FI-1608 Outlet (CA-1608-2)

CAUTION

Do NOT run a boric acid pump dead-headed for more than 30 seconds.

NOTE

Local operation of boric acid pumps must be performed by a licensed operator, or an RO trainee in the presence of a licensed operator.

9.3 Operate Boric Acid Pump(s) (P-39A or P-39B or both) locally from Boric Acid Panel C101 OR remotely from C04 to add desired volume recorded on Attachment B.

9.3.1 Calculate volume addition by multiplying MU Filter Flow IND (FI-1608) flow rate by time in minutes BA pump(s) are run.

9.3.2 Verify RCS concentration at each 30 ppmB interval by chemistry sample.

9.4 WHEN desired addition is complete
AND it is desired to realign the Batch Controller,
THEN perform the following:

9.4.1 Stop the running boric acid pump(s).

9.4.2 Close CA-71.

9.4.3 Close CA-69.

9.4.4 IF CA-73 was closed,
THEN perform the following:

A. Open CA-73.

B. Lock CA-73.

C. Complete required entry on Category E/Locked Component Log (E-DOC 1015.001H).

D. Perform required Independent Verification that CA-73 is open AND locked.

E. Complete required entry on Category E/Locked Component Log (E-DOC 1015.001H).

9.5 Update Attachment B.

JOB PERFORMANCE MEASURE

Unit: 1 Rev # 6 Date: _____

TUOI NUMBER: A1JPM-RO-EFW02

System/Duty Area: Emergency Feedwater

Task: Manually Control P7A at the Turbine

JA# ANO1-RO-EFW-NORM-7

KA Value RO 3.1 SRO 3.4 KA Reference 061 A2.05

Approved For Administration To: RO ☒ SRO ☒

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

Suggested Testing Environment And Method (Perform Or Simulate):

Plant Site: Simulate Simulator: _____ 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): 1106.006, Chg. 064-07-0, Section 13 or Exhibit C

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.

TUOI NUMBER: A1JPM-RO-EFW02

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 turbine was tripped and has been reset per Exhibit A, CV-2613/SV-2613 and CV-2663/SV-2663 are closed, no DC power on turbine control cabinet.

TASK STANDARD:

P7A running at ~1400 psig discharge pressure being controlled using T/T valve CV-6601A.

TASK PERFORMANCE AIDS:

Copy of Procedure 1106.006 Exhibit C.

TUOI NUMBER: A1JPM-RO-EFW02

INITIATING CUE: The SM/CRS directs that you manually start P-7A and control at approximately 1400 psig discharge pressure.

CRITICAL ELEMENTS (c): 1, 3

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
INSTRUCTOR NOTE: Proceed to EFW pump room on 335 elevation in Controlled Access of Aux Building.					
C	1. Close EFW Turbine K3 Trip/Throttle valve (CV-6601A). POSITIVE CUE: Handwheel does NOT move any further, valve is closed.	Closed CV-6601A by rotating hand wheel in close direction (clockwise).	____	____	____
	2. Request control room to open EFW Turbine K3 Steam Admission valve (CV-2613 or CV-2663). POSITIVE CUE: Control Room reports valve is open.	Called control room and requested CV-2613 or CV-2663 to be opened.	____	____	____
C	3. Open EFW Turbine K3 Trip/Throttle valve (CV-6601A). POSITIVE CUE: Pump discharge pressure is approximately 1400 psig.	Slowly opened CV-6601A (counter clockwise) until approximately 1400 psig discharge pressure was attained.	____	____	____
	4. Monitor turbine speed indication (if available) to ensure turbine does not exceed 3776 RPM or pump discharge pressure at ~1400 psig. POSITIVE CUE: Turbine speed is ~ 3650 RPM or pump discharge pressure 1400 psig.	Checked turbine speed at the local control cabinet and approximately 3650 RPM or monitored pump discharge pressure indication and maintained at~1400 psig.	____	____	____

END

TUOI NUMBER: A1JPM-RO-EFW02

INITIAL CONDITIONS:

Turbine driven EFW Pump, P-7A, turbine was tripped and has been reset per Exhibit A, CV-2613/SV-2613 and CV-2663/SV-2663 are closed, no DC power on turbine control cabinet.

INITIATING CUE:

The SM/CRS directs that you manually start P-7A and control at approximately 1400 psig discharge pressure.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **EMERGENCY FEEDWATER PUMP OPERATION** SET #	DOCUMENT NO. **1106.006**	CHANGE NO. **064-07-0**
	WORK PLAN EXP. DATE **N/A**	TC EXP. DATE **N/A**
	SAFETY-RELATED ☒YES ☐NO	IPTE ☒YES ☐NO
	TEMP ALT ☒YES ☐NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**Effective Communication**
Distraction/Interruption	**Questioning Attitude**
Multiple Tasks	**Placekeeping**
Over Confidence	**Self Check**
Vague or Interpretive Guidance	**Peer Check**
First Shift/Last Shift	**Knowledge**
Peer Pressure	**Procedures**
Change/Off Normal	**Job Briefing**
Physical Environment	**Coaching**
Mental Stress (Home or Work)	**Turnover**

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	**1000.006A**	**050-00-0**

MANUAL CONTROL OF EMERGENCY FEEDWATER PUMP P-7A

NOTE

Loss of electrical signal to the speed controller or loss of control oil pressure will allow EFW TURB K3 GOV Servo (CV-6601B) to travel full open and cause an overspeed trip of the turbine.

1.0 IF EFW Pump Turbine K3 tripped either on loss of electric signal to speed controller
OR on loss of control oil pressure
AND fault cannot be corrected,
THEN turbine speed may be manually controlled as follows:

1.1 Reset trip per Exhibit A, "Emergency Feedwater Pump P-7A Overspeed Trip Reset".

1.2 Close EFW Turbine K3 Trip/Throttle Valve (CV-6601A) by turning handwheel fully clockwise.

1.3 Open EFW Pump Turbine K3 Steam Admission Valve (CV-2613 or CV-2663).

1.4 Slowly open CV-6601A by turning handwheel counterclockwise until desired turbine speed or discharge pressure is reached.

CAUTION

Exceeding turbine speed of 3776 RPM may result in excessive discharge pressure with P7A suction aligned to Service Water.

1.5 Monitor turbine speed OR pump discharge pressure.

1.5.1 Throttle CV-6601A as necessary to maintain pump discharge pressure ~1400 psig at EFW P-7A Discharge PRESS (PI-2811A) OR as directed by control room personnel.

1.5.2 IF turbine speed indication is available,
THEN control turbine speed ~3650 RPM.

1.5.3 WHEN failure is corrected,
THEN slowly open CV-6601A fully while monitoring for proper speed control by the governor valve

A. Close CV-6601A 3/4 turn to prevent binding on heatup.

1.5.4 Verify P-7A TURBINE TRIP (K12-B5) clear.

MANUAL CONTROL OF EMERGENCY FEEDWATER PUMP P-7A

2.0 IF EFW Pump Turbine K3 is in operation,
AND manual control is being taken to avoid loss of P-7A due to anticipated loss of control power,
THEN perform the following:

NOTE

The following step will result in a P-7A TURBINE TRIP (K12-B5) alarm.

2.1 Slowly throttle closed on EFW Turbine K3 Trip/Throttle Valve (CV-6601A), until EFW TURB K3 GOV Servo (CV-6601B) is full open, AND EFW P-7A Discharge PRESS (PI-2811A) drops slightly.

2.2 Notify control room personnel of the following:

- Manual control of P-7A has been established
- EFW P-7A Turbine Control Power breaker (D21-30) may be opened, if required

CAUTION

Exceeding turbine speed of 3776 RPM may result in excessive discharge pressure with P7A suction aligned to Service Water.

2.3 Monitor turbine speed or pump discharge pressure.

2.3.1 Throttle CV-6601A as necessary to maintain pump discharge pressure ~1400 psig at EFW P-7A Discharge PRESS (PI-2811A) OR as directed by control room personnel.

2.3.2 IF turbine speed indication is available,
THEN control turbine speed ~3650 RPM.

2.4 WHEN failures are corrected
AND control power is regained,
THEN perform the following:

2.4.1 Verify breaker D21-30 is closed.

2.4.2 Slowly open CV-6601A fully while monitoring for proper speed control by the governor valve.

A. Close CV-6601A 3/4 turn to prevent binding on heatup.

JOB PERFORMANCE MEASURE

TUOI: A1JPM-RO-ED030

UNIT: 1 REV # 1 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: 3.9 SRO: 3.4 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. 012-13-0

_____

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: _____

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:

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

INITIATING CUE:

The Shift Manager requests you to place Battery Charger D-03B in service on Bus D01 and remove Battery Charger D-03A from service.

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. • AC Input breaker • DC Output breaker	On front of charger D-03B, verified the AC Input and DC Output breakers open (OFF).	____	____	____
	2. Verify AC feeder breaker to charger D-03B closed (B-5733).	Verified breaker B-5733 closed (ON).	____	____	____
EXAMINER NOTE: In the following step, Caution the examinee not to break plane of cubicle door.					
	3. Verify charger D-03B supply to bus breaker closed (D01-42).	Inside panel D01, verified breaker D01-42 closed (ON).	____	____	____
	4. Verify Manual Disconnect for battery D-07 closed (D-13).	At D13, verified manual disconnect for battery D07 closed (ON).	____	____	____
(C)	5. Close D-03B AC Input breaker.	On front of charger D-03B, closed the AC Input breaker (ON).	____	____	____
(C)	6. Close D-03B DC Output breaker.	On front of charger D-03B, closed the DC Output breaker (ON).	____	____	____
	7. Wait ~1 minute for automatic load sharing to occur. CUE: Amps are rising on D-03B output ammeter and amps are falling on D-03A output ammeter.	Waited ~1 minute, observed rising amps on D-03B and falling amps on D-03A.	____	____	____
(C)	8. Open D-03A DC Output breaker.	On front of charger D-03A, opened the DC Output breaker (OFF).	____	____	____
(C)	9. Open D-03A AC Input breaker.	On front of charger D-03A, opened the AC Input breaker (OFF).	____	____	____

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	10. Check Charger D-03B picks up load. CUE: • D-03B DC Out ~100 amps • AC In ~30 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.	____	____	____
	11. Reset local alarm panel for Charger D-03B.	At charger D-03B, pressed "R" button on RIS panel.	____	____	____
(C)	12. Place D-03B alarm to control room toggle switch ON.	At charger D-03B, placed control room alarm switch to ON (up).	____	____	____
	13. Place D-03A alarm to control room toggle switch OFF.	At charger D-03A, placed control room alarm switch to OFF (down).	____	____	____
	14. Check annunciator D01 CHARGER TROUBLE (K01-E7) clears.	Called control room and requested check for clear annunciator K01-E7.	____	____	____
ALTERNATE PATH CUE: Inform examinee that D-03A DC Output Voltage drifted to zero, also inform examinee that one minute has passed since D-03A was de-energized.					
(C)	15. Close D-03A AC Input breaker.	On front of charger D-03A, closed the AC Input breaker (ON).	____	____	____
	16. Check D-03A DC output voltage and AC input voltage. CUE: • 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.	On front of charger D-03A, opened the AC Input breaker (OFF).	____	____	____
	18. Submit condition report and WR.	Examinee stated that he would submit a condition report and Work Request or Work Order on D-03A.	____	____	____
JPM Complete					

END

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

Battery Charger D-03A is in service on Bus D01.

INITIATING CUE:

The Shift Manager requests 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.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **BATTERY AND 125V DC DISTRIBUTION**	DOCUMENT NO. **1107.004**	CHANGE NO. **012-13-0**
	WORK PLAN EXP. DATE **N/A**	TC EXP. DATE **N/A**
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☒YES ☐NO
	TEMP ALT ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	Effective Communication
Distraction/Interruption	Questioning Attitude
Multiple Tasks	Placekeeping
Over Confidence	Self Check
Vague or Interpretive Guidance	Peer Check
First Shift/Last Shift	Knowledge
Peer Pressure	Procedures
Change/Off Normal	Job Briefing
Physical Environment	Coaching
Mental Stress (Home or Work)	Turnover

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	1000.006A	050-00-0

ATTACHMENT B

PLACING BATTERY CHARGER D-03B INTO SERVICE

NOTE

- Section 1 contains instructions for placing D-03B into service with D-03A to be removed from service.
- Section 2 contains instructions for placing D-03B into service with D-03A out of service.

1.0 To place Battery Charger for D01 (D-03B) into service and remove charger D-03A from service, perform the following:

1.1 Verify the following breakers open for charger D-03B:

A. D-03B AC Input Breaker on charger cabinet front.
B. D-03B DC Output Breaker on charger cabinet front.

1.2 Verify the following breakers closed for charger D-03B:

A. Battery Charger D-03B (B-5733)
B. Supply from Battery Charger D-03B (D01-42). Breaker inside cubicle, no external handle.

1.3 Verify Battery D-07 Manual Disconnect (D-13) closed.

1.4 Close D-03B AC Input Breaker on cabinet front.

CAUTION

Cycling Battery Charger Output Breaker could cause inservice inverters associated with this Battery Charger to swap to alternate source and blow fuses.

1.5 Close D-03B DC Output Breaker on cabinet front.

NOTE

Automatic load sharing should equalize the charger load within ~1 minute. However it is not necessary to wait if load does not equalize.

1.6 Wait ~1 minute to check for automatic load sharing (rising amps on D-03B, falling amps on D-03A, and then stabilizes).

1.6.1 IF load sharing does NOT occur,
THEN check D-03B DC output voltage ~130 volts AND continue.

NOTE

Opening the DC Output Breaker for D-03A may cause its DC output voltage to drift to zero and Local Alarm Panel lights to fade. (CR-ANO-2-2003-0423).

1.7 Open D-03A DC Output Breaker on cabinet front.

1.8 Open D-03A AC Input Breaker on cabinet front.

1.9 Check charger D-03B picks up load to maintain proper DC bus voltage:

1.9.1 Charger ammeter deflects to some nominal value.

1.9.2 Bus D01 voltage is maintained at ~130 volts.

1.10 Reset local alarm panel for charger D-03B.

1.11 Place D-03B alarm to control room toggle switch ON.

1.12 Place D-03A alarm to control room toggle switch OFF.

1.13 Check annunciator D01 CHARGER TROUBLE (K01-E7) clears.

1.14 IF D-03A DC output voltage drifted to zero when its DC output breaker was opened,
THEN perform the following to prove D-03A operability:

1.14.1 Ensure ~1 minute has passed after de-energizing D-03A.

1.14.2 Close D-03A AC Input Breaker on cabinet front.

1.14.3 Check D-03A DC output voltage ~ 130 VDC.

1.14.4 Check D-03A AC input voltage normal ~ 480 VAC.

1.14.5 IF D-03A DC output voltage does NOT return to normal, THEN contact electrical maintenance for support.

1.14.6 Open D-03A AC Input Breaker on cabinet front.

1.14.7 Perform the following even if D-03A is operable:

- Submit Condition Report
- Submit WR/WO

ATTACHMENT B

2.0 To place Battery Charger for D01 (D-03B) into service with charger D-03A out of service, perform the following:

2.1 Verify the following breakers open for charger D-03B:

A. D-03B AC Input Breaker on charger cabinet front.
B. D-03B DC Output Breaker on charger cabinet front.

2.2 Verify the following breakers closed for charger D-03B:

A. Battery Charger D-03B (B-5733)
B. Supply from Battery Charger D-03B (D01-42). Breaker inside cubicle, no external handle.

2.3 Verify Battery D-07 Manual Disconnect (D-13) closed.

2.4 Close D-03B AC Input Breaker on cabinet front.

2.5 Close D-03B DC Output Breaker on cabinet front.

2.6 Check charger D-03B picks up load to maintain proper DC bus voltage:

2.6.1 Charger ammeter deflects to some nominal value.

2.6.2 Bus D01 voltage is maintained at ~130 volts.

2.7 Reset local alarm panel for charger D-03B.

2.8 Place D-03B alarm to control room toggle switch ON.

2.9 Check annunciator D01 CHARGER TROUBLE (K01-E7) clears.

Facility: ANO-1	Scenario No.: 1 NEW	Op-Test No.:2005-1
Examiners:	Operators:	

Initial Conditions: IC 101
70% power holding for the start of P8B (2nd heater drain pump)
Power escalation to 100% in progress following maintenance to the "A" MFW pump.
Idle condensate pump handswitch is in P-T-L.

Turnover:
70% power holding for the start of P8B (2nd heater drain pump). Heater Drain Pump, P8A has just been placed in service per 1106.016, section 16.0 through 16.19. Step 16.20 is ready to be performed and P8B placed in service. All preparations for the start of P8B have been completed. Condensate Pump, P2A, is in P-T-L per the procedure and the SG/RX Demand H/A station is in "AUTO".
Power escalation to 100% in progress following maintenance to the "A" MFW pump.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (CBOT)	Start a heater drain pump during power escalation
2	N/A	R (CBOR)	Power escalation toward 100% following maintenance to main Feedwater pump and after Heater Drain Pumps in service.
3	TR565 Ramp=4 Min.	I (CBOR)	RCS T_{hot} slowly fails low
4	N/A	N (CBOR)	Place the ICS in AUTO.
5	RX604 30%/min.	C (CBOT)	False increasing pulser signal to EHC causes Turbine Generator to raise load.
6	ED191	C (CBOT)	Loss of non vital bus B3
7	ED183	M (All)	Random electrical grid upsets result in loss of offsite power. Reactor trip. Degraded Power.
8	IRF B6231 IOR DO_HS3807G OFF IOR DO_HS3807R OFF	C (CBOT)	EDG #2 service water valve (CV3807) breaker trips during opening causing minimal flow to the EDG for cooling.
9	DI_A_MSLI_1A False DI_A_MSLI_1B False DI_A_MSLI_2A False DI_A_MSLI_2B False DI_B_MSLI_1A False DI_B_MSLI_1B False DI_B_MSLI_2A False DI_B_MSLI_2B False	C (CBOR)	All MSLI pushbuttons on the EFIC Remote Switch Matrix fail to manually actuate the MSLI function requiring alternative effort for performing function.

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

Scenario #1 Objectives

1) Evaluate individual response to input signal failures to the Integrated Control System
2) Evaluate individual response to electrical system abnormal conditions
3) Evaluate individual response to a loss of offsite electrical power
4) Evaluate individual ability to start and control components of the feed and condensate system
5) Evaluate individual ability to perform a power escalation in accordance with plant procedures
6) Evaluate individual ability to recognize abnormal conditions associated with automatically actuated systems and components
7) Evaluate individual response to failure of actuation function associated with the Main Steam Line Isolation portion of EFIC

SCENARIO #1 NARRATIVE

The scenario begins with a power escalation to 100% in progress following maintenance to the “A” Main Feedwater pump. Power has been stabilized at ~70% to place the heater drain pumps in service to provide sufficient feedwater pump suction pressure to continue the power rise to 100%. The crew will place the second heater drain pump in service and begin the power escalation.

As power is raised toward ~80% power, an RCS hot leg temperature transmitter, that is providing input to the Integrated Control System, fails low. This failure, being a slow failure, and therefore the Smart Automatic Signal Selector system will not select the redundant instrument, causes a plant transient that will include control rods to withdraw and feedwater flow to be lowered. The crew is expected to intervene and stop the transient by placing the ICS in “Manual” mode and correct the affected plant parameters to stabilize the plant. Once stable, the crew will select the redundant (good) instrument to provide input to the ICS and perform the normal operation of placing the ICS in “Automatic” mode.

When the ICS is placed in “AUTO” following the temperature transmitter failure, the Turbine will begin rising without a commanded signal. The crew should recognize the rising turbine load and lowering of the turbine header pressure and place the turbine in a manual mode, either “OPER AUTO” or “Turbine Manual”. Contacts to support organizations should begin to troubleshoot the turbine malfunction. The Turbine will remain in a manual mode at this time.

An internal breaker fault in the feeder breaker to the non-vital B3 bus will cause the breaker to trip, causing a loss of the non-vital B3 bus. The crew is expected to respond to the loss of B3 using Annunciator Corrective Actions and Abnormal Operating Procedure for Loss of Loadcenter. The crew will start redundant equipment as directed by the operating procedures and stabilize the plant.

SCENARIO #1 NARRATIVE (continued)

Due to random electrical grid upsets in the system, a loss of offsite power will occur. The Reactor will trip automatically and the crew will begin addressing the Reactor Trip and degraded power situation. Once the Reactor Trip immediate actions have been completed, the crew will transition to the Degraded Power procedure for guidance.

While verifying the proper operation of actuated components due to the degraded power, the discovery of the service water valve to the #2 EDG failure will require the crew to take action to restore service water to the EDG or stop the EDG to protect it from damage due to overheating.

During performance of actions required by the Degraded Power procedure, the crew will be prompted to actuate MSLI on both OTSGs to establish a “vital island” concept for the heat removal from the primary to the secondary. When the operator attempts to actuate the function from the normally utilized remote switch matrix, the matrix buttons fail to execute the command. The crew must take contingency action to establish the MSLI function. This may be accomplished by manual positioning of the affected components or actuation of the function from the EFIC cabinets in the back of the control room.

The scenario will be terminated when the plant is at a point where the crew is awaiting the return of offsite power or at the discretion of the lead evaluator.

Simulator Instructions for Scenario 1

Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description
1	Upon shift relief T=0	N/A	N/A	Start a heater drain pump during power escalation
2	P8B in service (T=15)	N/A	N/A	Power escalation toward 100% following maintenance to main Feedwater pump and after Heater Drain Pumps in service.
3	Cued by lead evaluator	IRF TR565	520 Ramp=240	RCS T_{hot} slowly fails low
4	Following selection of good transmitter	N/A	N/A	Place the ICS in AUTO.
5	When ICS in AUTO T=45	RX604	30%	False increasing pulser signal to EHC causes Turbine Generator to raise load.
6	T=57	ED191	N/A	Loss of non vital bus B3
7	T=67	Actuate Trigger 1 ED183	N/A	Random electrical grid upsets result in loss of offsite power. Reactor trip. Degraded Power.
8	T=67	Actuate Trigger 1 IRF B6231 IOR DO_HS3807G IOR DO_HS3807R	.05 OFF OFF	EDG #2 service water valve (CV3807) breaker trips during opening causing minimal flow to the EDG for cooling.
9	Pre-loaded This event will occur when the crew performs step to actuate MSLI	DI_A_MSLI_1A DI_A_MSLI_1B DI_A_MSLI_2A DI_A_MSLI_2B DI_B_MSLI_1A DI_B_MSLI_1B DI_B_MSLI_2A DI_B_MSLI_2B	False False False False False False False False	All MSLI pushbuttons on the EFIC Remote Switch Matrix fail to manually actuate the MSLI function requiring alternative effort for performing function.

Op-Test No: 2005-1 Scenario No: 1 Event No: 1 Event Description: Start a heater drain pump during power escalation		
Time	Position	Applicant's Actions or Behavior
T=0	CRS	Direct the crew to place the "B" Heater Drain Pump in service per 1106.016, Condensate, Feedwater, and Steam System Operation.
	CBOT	At panel C12, Start P8B.
	CBOT	Monitor Heater Drain Pump discharge flow on the plant computer.
	CBOT	Dispatch the Auxiliary Operator to gradually open the manual discharge valve for P8B, (CS-59B), approximately 5 turns.
IA NOTE: To open CS59B; **IRF CS59B .35 60**		
	CBOT	Using the controller on C12 for CV2810, slowly throttle closed the associated Recirc Control Valve. Monitor drain tank level, P8B discharge flow, and main feedwater pump suction pressure, while slowly lowering T40B level.
	CREW	When discharge flow is approximately 0.5 X 10^6 lb/hr, verify K06-A8 (P8A/P8B FLOW LO) clears.
	CBOT	WHEN T-40 level ~111", THEN place Recirc Control Valve in AUTO.
	CBOT	Verify Recirc Control Valve maintains Heater Drain Tank level ~111" (~49%).
	CBOT	Coordinate with the Auxiliary Operator to complete the alignment per the procedure.
	CBOT	Return idle Condensate Pump, P-2, handswitch to normal-after-stop.
	CBOT	Close Low Level Condenser Sprays (CV-2907 and CV-2868) on C02.
Event Termination: P8B in service with recirc valve in AUTO		

Op-Test No: 2005-1 Scenario No: 1 Event No: 2 Event Description: Power escalation toward 100% following maintenance to main Feedwater pump and after Heater Drain Pumps in service.		
Time	Position	Applicant's Actions or Behavior
T=15	CRS	Direct the crew to escalate power at the desired rate as established by applicable procedures, instructions, ODMIs, etc. NOTE: The normal maneuvering rate for this situation would be 30%/Hr. however due to the small failed fuel the unit is experiencing, Reactor Engineering has recommended a rate of 15%/Hr. to 90% power, and 5%/Hr. to 100% in accordance with the ODMI established for this condition.
	CBOR	Using the rate of change setpoint on C03, set the rate at the desired value. (0.5 on the dial sets 30%/Hr.; 0.25 on the dial sets 15%/Hr.)
	CBOR	Using the toggle switch on the ULD station, set the load demand to ~800MW. (This begins the power escalation to approximately 90% power.)
	CBOR	Monitor the plant parameters for proper response to power escalation. Verify rod index limits and Axial Power Imbalance limits are not exceeded.
	CBOT	Monitor the turbine generator to ensure it responds properly to the power escalation.
Event Termination: Cued by Evaluator for next event		

Op-Test No: 2005-1 Scenario No: 1 Event No: 3 Event Description: RCS T_{hot} slowly fails low		
Time	Position	Applicant's Actions or Behavior
Cued by Evaluator	CBOR	Acknowledge and report annunciator alarm K07-B4, SASS Mismatch, is in alarm.
	CBOR	Identify the SASS enable light for the loop "B" Thot instrument on C03 has gone out.
	CBOR	Identify a plant transient is in progress.
	CRS	Direct the CBOR to place ICS in "MANUAL". (At a minimum, the "A" and "B" feedwater loop demands and the Reactor Demand Hand/Auto stations should be placed in "MANUAL")
CT	CBOR	Place the "A" and "B" feedwater loop demands and the Reactor Demand hand/auto stations in "Manual" and verify the transient stops. **IF** the control rods continue to move, place the Diamond Station in "MANUAL".
	CRS	Direct the crew using Annunciator Corrective Action 1203.012F for the SASS Mismatch alarm.
	CBOT	Verify the signal from the non-selected instrument is a valid good signal on PMS.
	CBOR	When directed, select the opposite instrument for Loop "B" Thot on C03.
	CBOR	Verify the proper response to the selection of the good instrument.
	CRS	Direct the crew to slowly adjust control rods and feedwater to restore Tave back to the desired value.
	CBOR	Slowly adjust feedwater demand stations and control rods to return Tave to ~579°F.
Event Termination: Next event		

Op-Test No: 2005-1 Scenario No: 1 Event No: 4 Event Description: Place the ICS in AUTO.		
Time	Position	Applicant's Actions or Behavior
After good transmitter selected	CRS	Direct the crew to place the ICS in "AUTO".
	CBOR	Establish the initial conditions of 1105.004, step 8.1.1. (This may require placing the SG/RX Master to "HAND")
	CBOT	Verify the turbine controls in "INTEG CONTROL" and controlling turbine header pressure at setpoint.
	CBOR	Check the FW loop demand measured variable setpoints on the carat. If not, adjust with the SG/RX Master and/or the ΔT-cold H/A station.
	CBOR	Check Tave at setpoint or adjust in accordance with the procedure.
	CBOR	Check Reactor Demand H/A station measured variable on the carat.
	CBOR	Check SG/RX Master H/A station position and measured variable are approximately equal.
	CBOR	With the above stations aligned, place them in AUTO in the following sequence: A. Rod Controller (Diamond Panel), if applicable B. Reactor Demand C. Feedwater Loop Demands D. Load Ratio ΔT-cold E. SG/RX Master
Event Termination: When the plant is stable with ICS in AUTO **OR** Next event		

Op-Test No: 2005-1 Scenario No: 1 Event No: 5 Event Description: False increasing pulser signal to EHC causes Turbine Generator to raise load.		
Time	Position	Applicant's Actions or Behavior
T=45	CBOT	Recognize and report the turbine reference and setter signals are rising.
	CBOR	Report the turbine header pressure is lowering.
NOTE: The Turbine may revert to "OPER AUTO" due to the pressure bias before the crew can take the action to place in a manual mode (OPER AUTO or MANUAL)		
	CRS	Direct the CBOT to place the turbine EHC control in "Operator Auto" or "Turbine Manual" mode.
	CBOT	Place the turbine EHC in either "Operator Auto" or "Turbine Manual" mode.
	CBOR	Acknowledge and report "ICS in Track" annunciator alarm.
NOTE: The CRS may also direct the placement of the SG/RX Master station to "HAND", but is not mandatory.		
	CRS	Direct the CBOT to slowly lower the turbine demand signal in manual to recover (lower) turbine header pressure.
	CBOT	Using the EHC control buttons for "Operator Auto" or "Turbine Manual" mode, lower the demand signal and observe the turbine load is lowering and turbine header pressure in beginning to rise back toward setpoint.
Event Termination: When the plant is stable **OR** Next event		

Op-Test No: 2005-1 Scenario No: 1 Event No: 6 Event Description: Loss of non vital bus B3		
Time	Position	Applicant's Actions or Behavior
T=57	CBOT	Identify the loss of bus B3 based on loss of lighting, annunciator alarms associated with electrical distribution and AMP meters on C10.
	CRS	Direct plant operations as per 1203.046, Loss of Load Center, section 3.3.
	CBOT/ CBOR	Verify Condenser Vacuum Pump C-5B running.
	CBOT	Verify Turbine Generator EHC oil pump P-14B running.
	CRS	Dispatch the Auxiliary Operator to verify Isophase Bus Cooler Fan, C-8B running.
	CRS	Dispatch the Auxiliary Operator to verify C-28B running.
	CRS	Dispatch an Auxiliary Operator to align the "B" Main Phase Transformer per instruction in 1203.046, step 3.4.5.
	CBOT	Verify Gland Steam Cond. Exhauster (C-1B) running.
	CBOT/ CBOR	Verify Backup Air Side Seal Oil Pump P-25 running.
	CRS	Refer to list on page 7 of 1203.046 and Attachment D of Electrical System Operations (1107.001) to determine any additional components that may require actions.
Event Termination: When the plant is stable and investigation of the Loss of B3 is directed **OR** Next event		

Op-Test No: 2005-1 Scenario No: 1 Event No: 7, 8, 9		
Event Description:	Random electrical grid upsets result in loss of offsite power. Reactor trip. Degraded Power. EDG #2 service water valve (CV3807) breaker trips during opening causing minimal flow to the EDG for cooling. All MSLI pushbuttons on the EFIC Remote Switch Matrix fail to manually actuate the MSLI function requiring alternative effort for performing function.	
Time	Position	Applicant's Actions or Behavior
T=67	CREW	Recognize and report the reactor trip and loss of offsite power
	CRS	Direct immediate actions per the Reactor Trip Procedure, 1202.001.
	CBOR	Manually trip the reactor by depressing the Rx. Trip pushbutton. Verify all rods on bottom and power dropping. Report to the CRS when asked.
	CBOT	Manually trip the turbine by depressing the Turbine Trip pushbutton. Report to the CRS when asked.
	CBOR/ CBOT	Verify adequate subcooling margin. Report to the CRS when asked.
	CRS	Transition to the Degraded Power Emergency Operating Procedure (1202.007). Direct operations per 1202.007. **(Tech Spec. 3.8.1.C, AC Sources – Operating, Two required offsite circuits inoperable)**
	CBOT	Verify both EDGs supplying associated ES buses with proper voltage, frequency and loading: • 4100 to 4200V • 59.5 to 60.5 Hz • ≤2750 kw
	CBOT/ CBOR	Verify SW to DG1 and DG2 CLRs open to operating EDGs (CV-3806 and 3807).
CT	CBOT	Report to the CRS that the service water valve to the #2 EDG, CV3807, is de-energized and cannot verify the position.
	CRS	Dispatch the Auxiliary Operator to the #2 EDG room to investigate the status of the service water valve, CV3807, and position. Instruct him to manually open the valve if it is not open.
-Continued-		

Op-Test No: 2005-1 Scenario No: 1 Event No: 7, 8, 9		
Event Description:	Random electrical grid upsets result in loss of offsite power. Reactor trip. Degraded Power. EDG #2 service water valve (CV3807) breaker trips during opening causing minimal flow to the EDG for cooling. All MSLI pushbuttons on the EFIC Remote Switch Matrix fail to manually actuate the MSLI function requiring alternative effort for performing function.	
Time	Position	Applicant's Actions or Behavior
	CRS	Discuss the contingency plan with the CBOT to secure the #2 EDG if service water is not aligned and a "Critical Trouble" annunciator alarm is received.
NOTE: Call as the Auxiliary Operator and inform the CRS that the service water valve may be partially open but the valve will not manually open any further. It appears to be mechanically failed.		
	CBOT	Verify OR start a Service Water pump on each operating DG, after 15-second time delay (P4A, B, C).
	CBOR	Actuate MSLI for both SGs AND verify proper actuation and control of EFW and MSLI (RT 6): Identify that the remote switch matrix will not work to actuate MSLI for either OTSG on either train. **(Tech. Spec. 3.3.12 Emergency Feedwater Initiation and Control (EFIC) Manual Initiation)** **Two manual initiation switches per actuation train for each of the following EFIC Functions shall be OPERABLE:** **a. Steam generator (SG) A Main Steam Line Isolation;** **b. SG B Main Steam Line Isolation; and** **c. Emergency Feedwater (EFW) Initiation.)**
	CRS	Direct the CBOR to manually close the MSIVs and MFIVs on panel C09 or use the trip modules in the EFIC cabinets to actuate MSLI for both OTSGs.
	CBOR	Close the MSIVs and MFIVs for both OTSGs using the handswitches on C09 **OR** go to the EFIC cabinets and actuate MSLI for both OTSGs on both trains on the trip modules. Verify the actions per RT6 steps C. and D.
	CRS	Check RCS press remains ≥1700 psig **AND** PZR level remains ≥30".
	CBOT	Isolate Letdown by closing either: Letdown Coolers Outlet (CV-1221) OR Letdown Cooler Outlets (CV-1214 and 1216).
-Continued-		

Op-Test No: 2005-1 Scenario No: 1 Event No: 7, 8, 9		
Event Description:	Random electrical grid upsets result in loss of offsite power. Reactor trip. Degraded Power. EDG #2 service water valve (CV3807) breaker trips during opening causing minimal flow to the EDG for cooling. All MSLI pushbuttons on the EFIC Remote Switch Matrix fail to manually actuate the MSLI function requiring alternative effort for performing function.	
Time	Position	Applicant's Actions or Behavior
	CBOT	Place RCP Seal Bleedoff (Alternate Path to Quench Tank) controls in CLOSE (SV-1270, 1271, 1272 and 1273).
CT	CBOT	Isolate RCP Seal Bleedoff (Normal) by closing either: CV-1274 on C16 **OR** CV-1270, 1271, 1272, and 1273 on C18.
	CRS	When the #2 EDG Critical Trouble annunciator is received, direct the CBOT to secure the #2 EDG.
	CBOT	On panel C10, place the control switch for #2 EDG in the "LOCKOUT" position and verify the EDG stops. **(Tech. Spec. 3.8.1.B, Two diesel generators (DGs) each capable of supplying one train of the onsite Class 1E AC Electrical Power Distribution System.)**
	CRS	Return to Step 1 of Degraded Power procedure and perform the contingency steps for one EDG available.
	CRS	Call Unit 2 control room and request the use of the Alternate AC Generator.
	CRS	When Unit 2 informs him the Alternate AC Generator is ready for use, Direct the CBOT to energize the A4 Bus from the AAC Generator.
	CBOT	Using the guidance in 1107.002, step 31.2, energize the A4 Bus from the AAC Generator.
SCENARIO TERMINATION When the actions are complete to the point of awaiting the return of offsite power OR At the direction of the Lead Evaluator, terminate the scenario		

Facility: ANO-1	Scenario No.: 2 NEW	Op-Test No.:2005-1
Examiners:	Operators:	

Initial Conditions: IC 102
100% power; Equilibrium xenon
Power has been stable at 100% for last two days following return to full power after maintenance to the "B" main feedwater pump.
Chemistry is performing routine Tech Spec chemistry and sampling is aligned from pressurizer water space per 1104.002, Section 19.2.

Turnover:
100% power; Equilibrium xenon
Power has been stable at 100% for last two days following return to full power after maintenance to the "B" main feedwater pump.
Chemistry is performing routine Tech Spec chemistry and sampling is aligned from pressurizer water space per 1104.002, Section 19.2.
CV1207 seal injection control valve is in hand.
Small fuel leak based on RCS isotopic analysis for Cycle 19.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (CBOR)	Chemistry calls and reports boron samples with a 55 PPM difference. Equalize RCS/Pzr boron concentration
2	CV1008 .12	C (CBOR)	Pressurizer Spray Valve fails open
3	FW087	C (CBOT)	Heater drain pump "B" bearing heat up resulting in need to trip the pump. Pump will trip if no action is taken. (2 min.15 sec.- alarm, 3 min. 15 sec. –trip)
4	N/A	R (CBOR)	Lower power to ~70% in response to a trip of a heater drain pump
5	DI_ICC0009L False	C (CBOR)	ULD station fails to lower demand signal in manual
6	TR049 0	I (CBOR)	Pressurizer level transmitter fails low
7	RC001 (.325) R20:00	M (ALL) R	OTSG tube leak progressing to a ~150 gpm.
8	DI_H15C False	C (CBOT)	H1 feeder breaker from SU#1 transformer fails to close when transferring auxiliaries.
9	CO_P75	C (CBOT)	P75 will not start

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

Scenario #2 Objectives

1) Evaluate individual response to a feedwater and condensate system component failure.
2) Evaluate individual response to an Integrated Control System failure.
3) Evaluate individual response to a transmitter signal input failure to a controlling function.
4) Evaluate individual response to an electrical breaker failure
5) Evaluate individual response to an OTSG tube leak/rupture.
6) Evaluate individual ability to lower plant load in accordance with plant procedures.
7) Evaluate individual ability to operate controls to equalize boron concentrations between Reactor Coolant System and Pressurizer.
8) Evaluate the individual response to a failure of the RCS pressure or inventory control system component

SCENARIO #2 NARRATIVE

The scenario begins with an expected call from Chemistry to report the results of routine RCS sampling. The report informs the crew that a difference of 55 PPM exists between the RCS and the Pressurizer, requiring equalization to be performed to get the concentrations within 50 PPM. The crew will perform an RCS/Pressurizer boron equalization.

Using a compressed time line, Chemistry will call an inform the crew that the difference between RCS and Pressurizer boron is 5 PPM and the equalization can be secured, as they desire. The crew will take the actions to complete the equalization. As the Pressurizer spray valve is attempted to be closed, the operator will report the valve will not close and RCS pressure is continuing to decline. The crew should take the actions for a Pressurizer spray valve failure using AOP 1203.015 for guidance.

The “B” Heater Drain pump bearing will begin to heatup and cause an annunciator alarm. The crew will respond to the alarm by checking for the affected pump and taking actions to stop the pump. The pump may trip before the crew can stop it, and the CRS should direct a plant power reduction to stay within the high level dump capacity of the affected heater drain tank. As the crew is performing a power reduction, the operator will report the ULD station, being used to perform the power reduction, will not respond to his command. The CRS should direct the operator to use the SG/RX Master station to perform the power reduction.

The selected pressurizer level transmitter will fail low. The crew will take action to select the redundant transmitter for indication and control .

SCENARIO #2 NARRATIVE (continued)

The power maneuver will cause a tube in the “A” OTSG to begin leaking and progress to a rupture of ~150 gpm. The crew will respond to the “A” N16 Alarm and begin taking the actions of AOP 1203.023, Small Steam Generator Tube Leaks. The leak will exceed 10 gpm and require the crew to transition to the OTSG Tube Rupture EOP. The crew will begin a controlled plant shutdown.

At ~50% power, when plant auxiliaries are being shifted to startup transformer, the operator will report the feeder breaker from SU#1 to the H1 bus will not close. The crew must make a decision to either place the H1 bus on SU#2 or remove the handswitch from SU#2 out of Pull-To-Lock and allow the bus to transfer to SU#2 automatically when the unit is tripped.

The crew will continue with the shutdown and at ~12% power trip the unit. The crw should begin a plant shutdown at $\leq$ 100ºF/Hr. When directed to place the Auxiliary Feedwater Pump in service the pump will fail to start. This will require the crew to initiate EFW and continue the cooldown using EFW as the feedwater source until the Auxiliary Feedwater Pump is made available.

The scenario will be terminated when a cooldown is in progress and EFW is in service.

Simulator Instructions for Scenario 2

Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description
1	T=0	N/A	N/A	Chemistry calls and reports boron samples with a 55 PPM difference. Equalize RCS/Pzr boron concentration
2	T=15	IMF CV1008	.12	Pressurizer Spray Valve fails open
3	T=20	IMF FW087	N/A	Heater drain pump "B" bearing heat up resulting in need to trip the pump. Pump will trip if no action is taken. (2 min.15 sec.- alarm, 3 min. 15 sec. –trip)
4	N/A	N/A	N/A	Lower power to ~70% in response to a trip of a heater drain pump
5	N/A	IOR DI_ICC0009L	False	ULD station fails to lower demand signal in manual
6	T=35	IMF TR049	0	Pressurizer level transmitter fails low
7	T=40	IMF RC001	.325 R20:00	OTSG tube leak progressing to a ~150 gpm.
8	Pre-loaded	IOR DI_H15C	False	H1 feeder breaker from SU#1 transformer fails to close when transferring auxiliaries.
9	Pre-loaded	IRF CO_P75		P75 will not start

Op-Test No: 2005-1 Scenario No: 2 Event No: 1 Event Description: Chemistry calls and reports boron samples with a 55 PPM difference. Equalize RCS/Pzr boron concentration		
Time	Position	Applicant's Actions or Behavior
ROLE PLAY: Call as Chemistry and report RCS boron concentration is 782 PPM and Pressurize boron concentration is 837 PPM.		
T=0	CRS	Determine the need to equilize boron between the Pressurizer and RCS based on the report from Nuclear Chemistry that the Pressurizer is >50 ppm higher than the RCS.
	CRS	Using normal operations procedure 1103.005, direct the equilization of boron by either method 1 or 2.
	CBOR	IF using method 1: • Place Pressurizer spray valve in manual and open slightly • Place some Pzr heaters in manual and throttle spray flow to hold pressure steady • Monitor RCS pressure closely.
	CBOR	IF using method 2: • Place desired Pzr heaters in manual and monitor RCS pressure closely. • Verify Pzr spray valve cycles automatically to control RCS pressure between 2205 and 2155 psig
	CRS	Announce if any upset occurs while equalizing boron, immediately return Pressurizer heaters to automatic
NOTE This evolution should continue until another events occurs		

Op-Test No: 2005-1 Scenario No: 2 Event No: 2 Event Description: Pressurizer Spray Valve fails partially open.		
Time	Position	Applicant's Actions or Behavior
ROLE PLAY: Using time compression to complete the evolution, call as Chemistry and report the difference between RCS and Pressurizer boron is <5 PPM and equalization can be secured.		
T=15	CRS	Direct the CBOR to place the pressurizer heaters and spray valve in "AUTO".
	CBOR	Placed all pressurizer heaters and the pressurizer spray valve in "AUTO".
	CBOR	Report the pressurizer spray valve shows intermediate position and RCS pressure continues to lower.
	CRS	Direct operations per 1203.015, Section 6, Pressurizer System Failure AOP, for a failed Pressurizer Spray Valve. **T.S. TRM 3.4.3 Pressurization, Heatup and Cooldown Limitations**
	CBOR	Place the spray valve, CV1008, in "MANUAL" and hold in the close position. Report the valve did not close.
	CRS	Direct the CBOR to isolate the spray valve by closing the Pressurizer Spray Valve Isolation, CV1009.
	CBOR	Closed CV1009 on C04
	CBOR	Verify pressurizer heaters are energized and begin to restore RCS pressure.
EVENT TERMINATION CRITERIA Pressurizer spray valve is isolated and RCS pressure is recovering		

Op-Test No: 2005-1 Scenario No: 2 Event No: 3, 4, 5 Event Description: Heater drain pump "B" bearing heat up resulting in need to trip the pump. Pump will trip if no action is taken. Lower power to ~70% in response to a trip of a heater drain pump. ULD station fails to lower demand signal in manual.		
Time	Position	Applicant's Actions or Behavior
T=20	CBOR	Acknowledge and report Heater Drain Pump Bearing Temp Hi alarm, K06-E8.
	CRS	Direct actions per 1203.012E , Annunciator Corrective Action for K06-E8.
	CBOT	Check TR-2890 for the affected pump. Determine and report P8B bearing temperature rising.
NOTE: The crew may elect to stop the heater drain pump prior to it tripping due to the fault.		
	CBOR/ CBOT	Report P8B, Heater Drain Pump, trip.
	CRS	Direct operations per ACA 1203.012E, K06-A8 (P8A/B Flow Lo) and/or 1203.012E, K06-B7 (Condensate Pump Autostart).
	CBOR	Commence reduction in unit load to ~70% at ~10%/minute using the ULD.
	CBOR	Report to the CRS that the ULD will not change demand as requested.
	CRS	Direct the CBOR to place the SG/RX Master H/A station in "HAND" and lower power to ~70% at ~10%/minute.
NOTE: In the manual mode on the SG/RX master, the operator has control of the rate the plant will change. It is expected the operator will maintain the rate of change near the directed rate by the CRS.		
	CBOR	Place the SG/RX master in "HAND" and slowly toggled down, checking to determine the rate directed by the CRS.
-Continued-		

Op-Test No: 2005-1	Scenario No: 2	Event No: 3, 4, 5
Event Description:	Heater drain pump "B" bearing heat up resulting in need to trip the pump. Pump will trip if no action is taken. Lower power to ~70% in response to a trip of a heater drain pump. ULD station fails to lower demand signal in manual.	
Time	Position	Applicant's Actions or Behavior
	CBOT	Verify Turbine EHC responds to lowering load and maintains header pressure at or near setpoint. (Auto or manual)
	CBOR	Stabilize plant when power approaches ~70%.
EVENT TERMINATION CRITERIA Plant is stabilized at or near 70% power		

Op-Test No: 2005-1 Scenario No: 2 Event No: 6 Event Description: Pressurizer level transmitter fails low		
Time	Position	Applicant's Actions or Behavior
T=35	CBOR	Acknowledge and report "Pressurizer Level Lo" and "Pressurizer Level Lo-Lo alarms.
	CRS	Refer to Annunciator Corrective Action for K09-A3 and K09-C3.
	CBOR	Determine and report cause of Low level alarm is due to instrument failure.
	CRS	Refer to Pressurizer Systems Failure Abnormal Operating Procedure, 1203.015. **(Tech Spec. 3.3.15.A, Post Accident Monitoring (PAM) Instrumentation.)**
	CBOT	Check redundant level transmitter on PMS for validity.
	CRS	**If desired** direct the CBOR to place the Pressurizer Level control valve, CV1235, in "HAND" and adjust as necessary to stabilize Pressurizer level.
	CBOR	**If directed**, place CV1235 in "HAND" and close valve and allow the level do drop to desired level.
	CRS	Direct the redundant level transmitter selection on C04.
	CBOR	On C04, place HS-1002 to LT1002 ("good" transmitter). Verify the level indication responds to selected transmitter.
	CRS	Direct the CBOR to place CV1235 in "AUTO" if placed in "MANUAL" earlier.
	CBOR	Place CV1235 in "AUTO" and verify proper control.
EVENT TERMINATION CRITERIA Pressurizer level selected to the good transmitter **OR** next event.		

Op-Test No: 2005-1 Scenario No: 2 Event No: 7, 8, 9 Event Description: OTSG tube leak progressing to a ~150 gpm. H1 feeder breaker from SU#1 transformer fails to close when transferring auxiliaries. P75 will not start.		
Time	Position	Applicant's Actions or Behavior
T=40	CBOR/T	Identify and report "A" OTSG N16 TROUBLE annunciator (K07-A5).
	CBOR	Begin leak rate determination. **Tech. Spec. 3.4.13 RCS Operational LEAKAGE** **EAL 3.2 NUE OTSG Tube Leak ≥ T.S. Limit**
	CRS	Reference Small Generator Tube Leaks Abnormal Operating procedure (1203.023).
ROLE PLAY If notified as Chemistry to determine leak rate; using steam generator sample wait ~8 minutes (Time Compressed) then report approximate leak rate displayed on PS1 display.		
	CRS	Reference Rapid Plant Shutdown Abnormal Operating procedure (1203.045). Direct CBOT/CBOR to commence a plant shutdown at ~5% per minute.
	CBOR/ CBOT	Begin plant shutdown using the SG/RX Master H/A station in "MANUAL".
	CBOR/ CBOT	Report the leak rate has exceeded 10 GPM.
	CRS	Transition to OTSG Tube Rupture Emergency Operating procedure (1202.006).
	CRS	Direct the CBOT to "OPEN" the BWST Outlet to the operating makeup pump.
	CBOT	Open the BWST Outlet valve to the operating makeup pump.
	CRS	Direct Auxiliary Operators to implement Control of Secondary Contamination Abnormal Operating procedure (1203.014).
	CBOR	Place SG EFW Pump Turbine (K3) Steam Supply valve (CV-2667) in MANUAL and close.
-Continued-		

Op-Test No: 2005-1 Scenario No: 2 Event No: 7, 8, 9 Event Description: OTSG tube leak progressing to a ~150 gpm. H1 feeder breaker from SU#1 transformer fails to close when transferring auxiliaries. P75 will not start.		
Time	Position	Applicant's Actions or Behavior
CT	CBOT	Initiate HPI per RT2 as required. (If < 200 inches, perform RT2)
	CBOT	When unit is ≤70% stop Heater Drain Pumps (P8A, B).
	CBOT	When unit is ≤50% transfer station auxiliaries to Start Up #1 transformer.
	CBOT	Report that the breaker H15, SU#1 transformer to H1 bus, will not close.
NOTE: The CRS may elect to place H1 bus on SU#2 transformer or remove the handswitch for SU#2 from P-T-L and allow the bus to transfer to SU#2 when the unit is tripped.		
	CRS	When ≤350 MW and the Main Block Valves are closed, direct the CBOR to OPEN the FW cross-tie valve **and** trip the "B" MFW pump.
	CBOR	Open the FW cross-tie valve **and** trip the "B" MFW pump.
	CBOR	When both SG's are on low level limits; 1. Place both Feedwater Demand H/A Stations in HAND 2. Adjust demands to zero 3. Place Reactor Demand H/A station in HAND 4. Adjust to control reactor power at 10-12%.
	CBOT	When unit is ≤180 MW open HP Turbine Drain valves on C02.
	CBOT	When unit is ≤100 MW secure reheaters.
	CBOR	When reactor power is <12% 1. Select bad SG to indicate on Header press recorder. 2. Check Turbine Bypass valves controlling header pressure 880-920 psig 3. Verify plant auxiliaries on SU1
	CRS	Check PZR Level >200".
-Continued-		

Op-Test No: 2005-1 Scenario No: 2 Event No: 7, 8, 9 Event Description: OTSG tube leak progressing to a ~150 gpm. H1 feeder breaker from SU#1 transformer fails to close when transferring auxiliaries. P75 will not start.		
Time	Position	Applicant's Actions or Behavior
	CBOR	Trip Reactor **AND** immediately adjust Header Pressure Controller setpoint to 45. Verify all rods inserted **AND** Reactor power dropping.
	CBOT	Verify Turbine tripped.
	CBOR	Check Turbine Bypass valves controlling OTSG pressure 950-990psig.
	CBOR	Operate PZR heater and spray in hand as required to maintain RCS pressure low within the limits of figure 3.
	CBOR/ CBOT	Stabilize PZR level $\geq$55".
	CBOT	Verify OTSG N_{16} monitors selected to GROSS position.
	CRS	Direct the CBOR to begin a cooldown at $\leq$ 100º F/Hr.
CT	CBOR	Place Turbine Bypass valves for the "B" OTSG in hand and adjust to initiate and maintain a cooldown rate of $\leq$100°F/Hr.
	CRS	Direct placing the Auxiliary Feed pump, P75, in service.
	CBOT	Attempt to start P75 from the handswitch on C12. Report to the CRS that P75 will not start.
	CRS	Go To step 24 and direct the CBOR to actuate EFW and verify proper actuation and control (RT 5).
	CBOR	Actuate EFW and verify proper actuation and control (RT 5).
-Continued-		

Op-Test No: 2005-1	Scenario No: 2	Event No: 7, 8, 9
Event Description:	OTSG tube leak progressing to a ~150 gpm. H1 feeder breaker from SU#1 transformer fails to close when transferring auxiliaries. P75 will not start.	
Time	Position	Applicant's Actions or Behavior
	CBOR	Trip the "A" MFW pump.
	CRS	Transition to step 47.
SCENARIO TERMINATION CRITERIA RCS cooldown in progress and EFW in service OR As directed by the lead examiner.		

Facility: ANO-1	Scenario No.: 3 NEW	Op-Test No.:2005-1
Examiners:	Operators:	

Initial Conditions: IC 103
ICS in Automatic at ~25% power following a mid-cycle shutdown.
Power escalation is in progress per the Startup and Power Operations procedures.
“A” MFW pump is in service and “B” MFW pump is running at minimum speed.

Turnover:
ICS in Automatic at ~25% power following a mid-cycle shutdown.
Power escalation is in progress per the Startup and Power Operations procedures.
“A” MFW pump is in service and “B” MFW pump is running at minimum speed.
CV1207 seal injection control valve is in hand.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (CBOR)	Power escalation from ~25% power to 35% power to place “B” MFP in service
2	AI_TIC4018S (.7)	C (CBOT)	Automatic control of CV4018 fails to maintain generator temperatures
3	N/A	N (CBOR)	Place the second main feedwater pump in service
4	TR575 0 R20	I (CBOR)	“B” OTSG startup level transmitter fails low
5	CW084	C (CBOT)	P3C, Circulating Water Pump, winding temperature begins to heatup due to internal motor problem.
6	RC464 2.5 R7:00	M (ALL)	LOCA- Leak on an HPI line inside containment
7	RP245 RP246 RP247 RP248 DI_ICC0020 (False)	C (CBOR)	RPS fails to trip the reactor automatically on a valid RPS trip setpoint. The “Manual”trip button on C03 fails to perform a reactor trip. (The backup pushbuttons on C03 must be depressed to complete a reactor trip)
8	CV1407	C (CBOT)	BWST outlet valve CV1407 fails to open on ESAS signal

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

Scenario #3 Objectives

1) Evaluate individual response to component failures affecting cooling of the main turbine generator.
2) Evaluate individual response to input failures to the Integrated Control System.
3) Evaluate individual response to a loss of reactor coolant accident
4) Evaluate individual response to failure of automatic actuation systems.
5) Evaluate individual response to failure of Emergency Core Cooling System components.
6) Evaluate individual ability to maneuver the plant in accordance with plant procedures.
7) Evaluate individual ability to start and operate feedwater and condensate system components in accordance with plant procedures.
8) Evaluate individual response to failure of system or components associated with control of the secondary heat removal capabilities.

SCENARIO #3 NARRATIVE

This scenario begins with the plant at ~25-30% power with the “A” Main Feedwater Pump operating, and the Integrated Control System in “AUTO” with the exception of the ULD (STAR Module) which is in manual to perform power escalation. When the crew accepts responsibility for the control boards, the first event will be a power escalation to ~35-40% power to place the “B” Main Feedwater Pump in service and split the feedwater loops.

As plant load is increased, a failure of the automatic control valve for control of Auxiliary Cooling Water to the Main Generator hydrogen coolers causes Generator gas temperatures to begin rising. The crew will respond to alarms associated with generator gas temperature monitor and take manual control of the ACW control valve and regain cooling of the hydrogen gas.

The crew will place the “B” Main Feedwater Pump in service and prepare to continue the power escalation.

After the Feedwater pump is placed in service (“AUTO”) the selected “B” OTSG Startup Level transmitter will fail low requiring the crew to stop the Feedwater transient that occurs as the “B” Main Feedwater pump overfeeds the “B” OTSG. When the crew stabilizes the plant, they will select the good transmitter for control and place the ICS stations in “AUTO”.

The “C” Circulating Water Pump, P3C, will experience an internal electrical failure that will cause the winding temperature to rise to alarm setpoint. The crew will respond to the alarms and take actions to secure the faulted pump or respond to the trip of the pump. The idle pump should be placed in service. The crew should also monitor for loss of vacuum and lower plant load, if necessary, to stabilize vacuum.

SCENARIO #3 NARRATIVE (continued)

A reactor coolant system leak on an HPI line will cause RCS pressure to begin to rapidly drop. The crew should identify the LOCA and trip the unit. The RPS will fail to perform an automatic trip if the low pressure trip setpoint is reached and will require the crew to manually trip the reactor. The normal reactor trip pushbutton will fail to trip the reactor and the operator will need to use the backup trip pushbuttons on C03. The reactor will trip and the crew will perform the immediate actions of the Reactor Trip EOP and identify the failure of the RPS to perform its function.

RCS pressure will drop to the ESAS actuation setpoint and ESAS will actuate. CV1407, the BWST outlet to the “Red” Train components, will fail to open. The crew should stop the ES pumps associated with the RED train until the valve can be manually opened locally. While performing verifications of proper actuation of components, the operator will discover a difference in flows on the only operating HPI loop and throttle the valve associated with high flow to within 20 gpm of the other flows.

The scenario will be terminated when the RED train is restored to operation following the opening of CV1407 and EFW is feeding both OTSGs.

Simulator Instructions for Scenario 3

Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description
1	T=0	N/A	N/A	Power escalation from ~25% power to 35% power to place “B” MFP in service
2	T=0	IOR AI_TIC4018S	.7	Automatic control of CV4018 fails to maintain generator temperatures
3	T~15	N/A	N/A	Place the second main feedwater pump in service
4	T~30	IMF TR575	0 R20	“B” OTSG startup level transmitter fails low
5	T~45	IMF CW084	N/A	P3C, Circulating Water Pump, winding temperature begins to heatup due to internal motor problem.
6	T~55	IMF RC464	2.5 R7:00	LOCA- Leak on an HPI line inside containment
7	Pre-Loaded	RP245 RP246 RP247 RP248 IOR DI_ICC0020	N/A N/A N/A N/A False	RPS fails to trip the reactor automatically on a valid RPS trip setpoint. The “Manual”trip button on C03 fails to perform a reactor trip. (The backup pushbuttons on C03 must be depressed to complete a reactor trip)
8	Pre-Loaded	IMF CV1407	0	BWST outlet valve CV1407 fails to open on ESAS signal

Op-Test No: 2005-1 Scenario No: 3 Event No: 1, 2 Event Description: Power escalation from ~25% power to 35% power to place "B" MFP in service. Automatic control of CV4018 fails to maintain generator temperatures.		
Time	Position	Applicant's Actions or Behavior
T=0	CRS	Direct the crew to continue power escalation to ~350 MW at 30%/Hr. to place the "B" MFW pump in service.
	CBOR	Verify the rate of change station is set at .5%/minute (30%/Hr.) and begin a power escalation using the Unit Load Demand station. Set ULD demand to ~34-35%.
	CBOT	Monitor main generator hydrogen and reactive loading and maintain within the limits of Attachment N.
	CBOR	Compare rod index with a copy of the applicable page of Attachment K, Regulating Rod Insertion Limits ~ every 15 minutes to verify limits are not exceeded.
	CBOR	Monitor Heat Balance power on plant computer point XPP. Compare Heat Balance power with nuclear instrumentation.
	CBOT	Place Moisture Separator Reheaters in service.
	CBOR	Acknowledge and report annunciator K04 B6 in alarm (Generator H2 Temp HI)
	CRS	Provide direction per 1203.012C, Annunciator Corrective Action.
	CBOT	Monitor recorder TR-9001 and/or PMS dynamic alarm display for rising temperatures on the main generator.
	CBOT	Check/Verify CV4018, Generator Hydrogen Cooler outlet control valve on C19, operating properly.
	CBOT	Report the hydrogen cooler outlet control valve is closed.
	CRS	Direct the CBOT to attempt to manually operate the valve from the controller on C19.
-Continue-		

Op-Test No: 2005-1 Scenario No: 3 Event No: 1, 2 Event Description: Power escalation from ~25% power to 35% power to place "B" MFP in service. Automatic control of CV4018 fails to maintain generator temperatures		
Time	Position	Applicant's Actions or Behavior
	CBOT	Place the controller for CV4018 on C19 in "MANUAL" and open valve.
	CBOT	Monitor generator gas temperatures for stabilization or downward trending.
	CBOT	Adjust CV4018, manually, to control generator gas temperatures at or near desired temperature.
	CRS	Direct the CBOT to monitor PMS points XI-9003 and AI-9002, and points on TR-9001 for signs of generator winding degradation.
	CBOT	Using PMS and TR-9001, checked indications of generator winding degradation.
EVENT TERMINATION CRITERIA Main generator gas temperatures under control and power escalation resumes.		

Op-Test No: 2005-1 Scenario No: 3 Event No: 3 Event Description: Place the second main feedwater pump in service		
Time	Position	Applicant's Actions or Behavior
T~15	CRS	Direct the CBOR to place the "B" MFW pump in service.
	CBOR	Verify that the in-service MFW Pump H/A station is in auto and maintaining FW valve train ΔP at ~70 psid.
	CBOR	Slowly accelerate the 2nd MFWP until the in-service MFWP starts to slow.
	CRS	Direct the CBOT to reset RPS trips per Plant Startup (1102.002), Attachment E, "Anticipatory Reactor Trip System (ARTS) Reset" for the 2nd MFWP.
NOTE: There is only one RPS cabinet. RESET of ARTS in this cabinet will reset the function in all channels.		
	CBOT	Reset RPS trips for the 2nd MFWP.
	CBOR	Verify Main Feed Pump Recirc Control Valves closed AND controllers in AUTO.
	CBOR	Continue accelerating the 2nd MFWP until the following available parameters for both MFWPs are approximately equal: • Speed • Discharge pressure, if available • Suction flows on Feed Pumps Recirc H/A stations
	CBOR	Close Feedwater Pumps Discharge Crosstie (CV-2827).
	CBOR	Verify each MFWP either maintaining respective valve train ΔP at ~70 psid.
	CBOR	Place the 2nd MFW Pump H/A station into "AUTO".
EVENT TERMINATION CRITERIA "B" MFW Pump is in "AUTO"		

Op-Test No: 2005-1 Scenario No: 3 Event No: 4 Event Description: "B" OTSG startup level transmitter fails low		
Time	Position	Applicant's Actions or Behavior
T~30	CBOR	Acknowledge and report SASS Mismatch annunciator alarm, K07-B4.
	CBOR	Acknowledge and report "B" OTSG Low Level Limit alarm, K07-F3.
	CRS	Direct operation in accordance with ACA 1203.012F.
	CBOR	Recognize and report the "B" MFW pump speed rising and feedwater flow rising in the "B" feedwater loop.
	CRS	Direct the CBOR to place the "B" MFW pump H/A station in "HAND" and stop the rise in feedwater flow.
	CBOR	Place the "B" MFW pump H/A station in "HAND" and use the toggle switch to lower feedwater flow slightly to gain control of feedwater flow.
	CRS	Direct the CBOT to check the redundant instrument for a valid signal using PMS.
	CBOT	Check PMS and determine the opposite instrument in the "B" loop is indicating a valid signal.
	CRS	Direct the CBOR to select the NNI "Y" Startup level transmitter in the "B" loop.
	CBOR	Select the NNI "Y" Startup level instrument in the "B" loop and verify correct response.
	CRS	Direct the CBOR to place the "B" MFW pump H/A station in "AUTO".
	CBOR	Using 1105.004, ICS Operations procedure, place the "B" MFW pump H/A station in "AUTO".
EVENT TERMINATION CRITERIA "B" Startup Level Transmitter "Y" instrument selected and "B" MFW pump H/A station in "AUTO"		

Op-Test No: 2005-1 Scenario No: 3 Event No: 5 Event Description: P3C, Circulating Water Pump, winding temperature begins to heatup due to internal motor problem.		
Time	Position	Applicant's Actions or Behavior
T~45	CBOR	Acknowledge and report K05-D1, Circ Water Pump Motor Winding Temp. HI, in alarm.
	CRS	Direct operations as per Annunciator Corrective Action 1203.012D, K05-D1.
	CBOT	Determine which point is in alarm on recorder TR2808 on C19 or PMS displays for the circ water pumps.
	CRS	Dispatch the Auxiliary Operator to investigate the circ water pump for cause of alarm.
NOTE: The "C" Circ Water Pump may trip before the CRS can direct the pump be stopped.		
	CRS	Direct the CBOT to stop P3C, Circ Water Pump.
	CBOT	On C13, stop P3C. Observe the Discharge valve closes.
	CRS	IF P3C trips prior to being stopped, direct the CBOT to start the idle circulating water pump.
	CBOT	Start the idle circulating water pump and verify the discharge valve opens.
	CRS	If necessary, direct the CBOR to reduce power to stabilize vacuum.
	CBOR	IF directed, use the ULD station to reduce power to stabilize vacuum.
EVENT TERMINATION CRITERIA Next Event		

Op-Test No: 2005-1 Scenario No: 3 Event No: 6, 7, 8 Event Description: LOCA- Leak on an HPI line inside containment. RPS fails to trip the reactor automatically on a valid RPS trip setpoint. The "Manual" trip button on C03 fails to perform a reactor trip. (The backup pushbuttons on C03 must be depressed to complete a reactor trip). BWST outlet valve CV1407 fails to open on ESAS signal		
Time	Position	Applicant's Actions or Behavior
T~55	CBOR	Identify pressurizer level and RCS pressure dropping.
	CBOT	Recognize and report RCS leakage into the Reactor Building. **Tech Spec. 3.4.13.B RCS Operational LEAKAGE** **EAL 2.2, ALERT(RCS leakage >Normal Makeup capacity)**
NOTE: The crew may manually trip the reactor prior to reaching the low RCS pressure setpoint and therefore not see the RPS failure to perform an automatic trip.		
	CRS	Direct the CBOR/CBOT to trip the reactor and carry out the immediate actions. (This direction may or may not occur prior to an automatic trip)
	CBOR	Depress the Reactor Trip push-button on C03. Verify the reactor trips and power is dropping.
	CBOR	Diagnose Rx trip pushbutton failure **Tech. Spec. 3.3.1 Reactor Protection System (RPS) Instrumentation** **Tech. Spec. 3.3.2 Reactor Protection System (RPS) Manual Reactor Trip** **EAL 6.2 (Alert) Reactor Protection System Failure to Complete an Automatic Trip**
CT	CBOR	Depress both shunt trip pushbuttons on C04
	CBOT	Depress the Turbine Trip pushbutton on C01. Verify Turbine throttle and governor valves closed.
	CRS	Direct initiation of HPI per RT 2.
	CREW	Recognize the actuation of ESAS on low RCS pressure.
	CRS	Transition to ESAS procedure, 1202.010, and direct crew operations
-Continued-		

Op-Test No: 2005-1 Scenario No: 3 Event No: 6, 7, 8 Event Description: LOCA- Leak on an HPI line inside containment. RPS fails to trip the reactor automatically on a valid RPS trip setpoint. The "Manual" trip button on C03 fails to perform a reactor trip. (The backup pushbuttons on C03 must be depressed to complete a reactor trip). BWST outlet valve CV1407 fails to open on ESAS signal		
Time	Position	Applicant's Actions or Behavior
	CBOT	Recognize the BWST outlet, CV1407, didn't open and report to the CRS. Secure P36A, HPI pump, and P34A, LPI pump, after selecting "MAN".
	CBOR	Check for adequate subcooling margin. ($\geq$30ºF)
	CRS	Direct the Waste Control Operator to manually open CV1407.
IA OPERATOR NOTE: When the WCO is sent to manually open CV1407, open the valve. **IMF CV1407 1 240**		
	CBOT	Verify proper ESAS actuation per RT 10.
	CBOR	Close or verify closed the following valves; CV-1008, CV-1009, and CV-1000
CT	CBOT	Recognize only one train of HPI in service and HPI flow through one nozzle is excessive. Throttled CV1284 to within 20 gpm of the next highest flow.
	CBOR	Control RCS pressure within limits of Figure 3 of EOP (RT 14)
NOTE: IF subcooling margin is less than adequate (<30ºF), transition to the Loss of Subcooling Margin procedure and perform the following steps.		
	CBOR/ CBOT	Report subcooling margin is inadequate.
	CRS	Transition to Loss of subcooling margin procedure, 1202.002, and direct crew actions.
-Continued-		

Op-Test No: 2005-1	Scenario No: 3	Event No: 6, 7, 8
Event Description:	LOCA- Leak on an HPI line inside containment. RPS fails to trip the reactor automatically on a valid RPS trip setpoint. The "Manual" trip button on C03 fails to perform a reactor trip. (The backup pushbuttons on C03 must be depressed to complete a reactor trip). BWST outlet valve CV1407 fails to open on ESAS signal	

Time	Position	Applicant's Actions or Behavior
	CRS	Direct stopping all reactor coolant pumps.
CT	CBOT	Stop all reactor coolant pumps within 2 minutes **OR** trip one RCP per loop.
	CBOR	Control RCS pressure within limits of Figure 3 of EOP (RT 14)
	CRS	When CV1407 is reported "OPEN", direct the CBOT to start P36C, if the pump did not trip earlier.
	CBOT	Start P36C by placing the auto/man pushbutton to "MAN". Verify P36C starts and flow in HPI lines.
	CRS	Direct initiation of RT3, Full HPI.
	CBOT	Initiate full HPI using Repetitive Task 3 (RT3).

SCENARIO TERMINATION CRITERIA

Full HPI in service, EFW feeding both OTSGs

OR

Directed by Lead Examiner

Facility: ANO-1	Scenario No.: 4 (Spare) NEW	Op-Test No.:2005-1
Examiners:	Operators:	

Initial Conditions: IC 104
100% Power, Equilibrium Xenon

Turnover:
100% Power, Equilibrium Xenon, MOL (250 EFPD)
An RCS delithiation is anticipated for this shift. Chemistry will call to provide the duration of the evolution.
CV1207, Seal Injection control valve, is in manual due to oscillations of seal injection when in "auto".
Main Steam Safety Valve PSV2687 on the "B" main steam line is gagged due to premature lifting.

Event No.	Malf. No.	Event Type*	Event Description
1	BAT CRD.txt (Batch file that creates this condition)	I(CBOR)	CRD position indication faulty with a CRD W/D inhibit
2	N/A	N (CBOR)	Perform 5 minute RCS delithiation at the request of chemistry. (Idle purification DI is ~65 PPM above RCS boron concentration)
3	BAT ES19_2.txt (Batch file that creates this condition)	C (CBOT)	Condenser vacuum leak caused by the failure of the #5 turbine bearing gland seal regulator.
4	N/A	R (CBOR)	Power reduction to stabilize vacuum
5	CV098	C (CBOT)	Operating MU/HPI pump experiences high winding temperature and causes the pump to trip. The standby pump has no oil indicated in one of the oil bubblers and must have oil added prior to start.
6	MS143 MS134 .4	M (ALL)	Main steam safety valve associated with 'B' OTSG experiences structural failure and lifts. Steam Leak significant to warrant manual reactor trip.
7	TU155 TU156	C (CBOT)	The main turbine fails to fully trip when the unit is tripped. One governor valve and one throttle valve fail to close, requiring the crew to shut the MSIV from the affected OTSG.
8	CV2648 CV2626	C (CBOR)	EFW valves to "B" OTSG from P7B fail open and will not close from the handswitches.

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

Scenario #4 Objectives

1) Evaluate individual ability to perform an RCS delithiation in accordance with plant procedures.
2) Evaluate individual ability to perform a plant power reduction and stabilize the plant in accordance with plant procedures.
3) Evaluate individual response to faulty control rod position indication.
4) Evaluate individual response to a loss of condenser vacuum.
5) Evaluate individual response to loss of RCS makeup due to an HPI pump trip.
6) Evaluate individual response to a main steam line break/overcooling event.
7) Evaluate individual response to failure of the main turbine steam valves to close on a turbine trip.
8) Evaluate individual response to a failure of Emergency Feedwater System components.

SCENARIO #4 NARRATIVE

The scenario begins with the crew responding to annunciator alarms associated with the Control Drive System. The “Control Rod Asymmetric” and “CRD Withdrawal Inhibit” alarms are received and the crew will refer to the respective Annunciator Corrective Action procedures for direction. The ACAs will direct the crew to the “CRD Malfunction” AOP and the crew will begin diagnosing the situation. It should be determined by the crew that the condition is caused by faulty indication for Group 2, Rod #4. The crew will perform the actions required for a faulty control rod indication problem and bypass the alarm function for that rod. This will allow the crew to reset the asymmetric condition and regain control of the movement of the rods inhibited by the asymmetric condition.

Chemistry will call the control room and request they perform the 5 minute delithiation or the RCS that was anticipated at turnover. Chemistry will inform the crew that the idle Purification Demineralizer is 65 PPM boron higher than the current RCS boron concentration. The crew will refer to the Makeup and Purification procedure, 1104.002, and perform the actions for RCS Delithiation.

Condenser vacuum will begin to slowly decline and annunciators associated with the main turbine bearing #5 gland seal will alert the crew of a problem with the gland seal supply to the #5 bearing. The crew will respond to the ACA for the #5 bearing gland seal and “Loss of Condenser Vacuum” AOP. The crew will reduce plant load to stabilize vacuum. Gland sealing steam will be restored to the bearing gland and the vacuum will recover.

The operating makeup pump will experience rising motor windings temperatures due to an electrical fault in the motor. The crew will be prompted by an annunciator alarm and respond to stop the affected pump and start the standby makeup pump. The pump may trip prior to stopping and the crew should refer to the AOP for “Loss of Reactor Coolant Makeup”, 1203.026. The standby pump will be placed in service.

SCENARIO #4 NARRATIVE (continued)

The crew will receive an “MSSV OPEN” annunciator alarm. Verification using the SPDS will identify one MSSV on the “B” main steam line open and the crew will dispatch an operator to confirm steam releasing from exhaust piping in the penthouse area. The operator will report not only steam from the exhaust piping but steam releasing from the sides of the penthouse structure, indicating a significant size steam leak. The crew will determine the leak sufficient enough to trip the unit and begin isolation of the affected OTSG. During the isolation process, the crew discovers Emergency Feedwater is still being supplied to the affected OTSG and must take action to stop the flow of feedwater to stop the overcooling that is occurring as a result of the continuous feed. The crew will have to stop the electric driven EFW pump, P7B, to stop the flow of EFW to the “B” OTSG. This will allow the OTSG to boil dry and terminate the overcooling.

Simulator Instructions for Scenario 1				
Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description
1	T=2			CRD position indication faulty with a CRD W/D inhibit
2	T=20	N/A	N/A	Perform 5 minute RCS delithiation at the request of chemistry. (Idle purification DI is ~65 PPM above RCS boron concentration)
3	T=35	BAT ES19_1.txt	N/A	Condenser vacuum leak caused by the failure of the #5 turbine bearing gland seal regulator.
4	N/A	N/A	N/A	Power reduction to stabilize vacuum
5	T=45	IMF CV098	N/A	Operating MU/HPI pump experiences high winding temperature and causes the pump to trip. The standby pump has no oil indicated in one of the oil bubblers and must have oil added prior to start.
6	T=60	IMF MS143 IMF MS134	6 .4	Main steam safety valve associated with 'B' OTSG experiences structural failure and lifts. Steam Leak significant to warrant manual reactor trip.
7	N/A	IMF TU155 IMF TU156	100% 100%	The main turbine fails to fully trip when the unit is tripped. One governor valve and one throttle valve fail to close, requiring the crew to shut the MSIV from the affected OTSG.
8	Pre-loaded	IMF CV2648 IMF CV2626	1 1	EFW valves to "B" OTSG from P7B fail open and will not close from the handswitches.

Op-Test No: 2005-1 Scenario No: 4 (SPARE) Event No: 1 Event Description: CRD position indication faulty with a CRD W/D inhibit		
Time	Position	Applicant's Actions or Behavior
T=2	CBOR	Acknowledge and report annunciator alarms K08-A2 (CRD WITHDRAWAL INHIBITED) and K08-C2 (CONTROL ROD ASYMMETRIC).
	CRS	Direct the crew as per Annunciator Corrective Action 1203.012G, pages 7 and 14.
	CRS	Transition to Abnormal Operating Procedure, 1203.003 (Control Rod Drive Malfunction Action) and direct the crew actions.
	CRS	Direct the crew to determine if a dropped rod or if the control rod has faulty indication.
	CBOR	Determine that the control rod only has faulty indication due to the 100% out limit light on the PI panel on C13 still being lit.
	CRS	Direct an operator to bypass the alarm using the S-2 switch in the CRD cabinet.
IA NOTE: When sent to bypass the alarm with the S-2 switch, delete the asymmetric rod annunciator from alarm by deleting the override. **IRF K08C2 Normal**		
	CRS	Direct the CBOR to RESET the Asymmetric Fault using 1203.012G, K08-A2, instructions.
NOTE: If the neutron error is more negative than -1%, actions per Method 1 or 2 of 1203.012G for K08-A2 must be performed to ensure a plant transient does not occur.		
	CBOR	Verify Neutron Error on C03 is between -1% and +1%. Depress the Fault Reset on the Diamond Panel.
EVENT TERMINATION ICS in AUTO and the control rod alarms clear		

Op-Test No: 2005-1 Scenario No: 4 (SPARE) Event No: 2 Event Description: Perform 5 minute RCS delithiation at the request of chemistry. (Idle purification DI is ~65 PPM above RCS boron concentration)		
Time	Position	Applicant's Actions or Behavior
Role Play: Call as Chemistry and request a five minute delitiation. The idle Demineralizer is ~65 PPM higher than current RCS boron concentration.		
T~20	CRS	Direct the CBOR to conduct a 5 minute delithiation of the RCS in accordance with 1104.002, Makeup & Purification System Operation, section 10.6.
	CBOR	Open inlet to delithiating DI: • T-36A Purif Demineralizer Inlet (CV-1244) or • T-36B Purif Demineralizer Inlet (CV-1245) Close inlet to previously in-service DI (CV-1244 or CV-1245). Check that letdown flow is approximately equal to previous value.
	CBOR	When no more than 2.5 minutes have elapsed, swap back to the previously in-service DI as follows: a. Open inlet to previously in-service DI (CV-1244 or CV-1245). b. Close inlet to delithiating DI (CV-1244 or CV-1245). Check that letdown flow is approximately equal to previous value.
	CBOR	Allow plant to stabilize and then repeat placing the delithiating DI in service to achieve total delithiation time.
	CRS	Record the completion of the delithiation or call chemistry and inform them the evolution is complete.
EVENT TERMINATION Delithiation is complete **OR** next event		

Op-Test No: 2005-1 Scenario No: 4 (SPARE) Event No: 3, 4 Event Description: Condenser vacuum leak caused by the failure of the #5 turbine bearing gland seal regulator. Power reduction to stabilize vacuum		
Time	Position	Applicant's Actions or Behavior
T~35	CBOR	Acknowledge and report annunciator K05-D4, GS Pressure #5 Bearing Low.
	CRS	Direct actions of the crew per 1203.012D for K05-D4.
	CBOT	Recognize and report lowering condenser vacuum.
	CRS	Direct operations per AOP 1203.016, Loss of Condenser Vacuum, and AOP 1203.045, Rapid Plant Shutdown.
	CBOR	Commence a power reduction using the ULD as directed to stabilize condenser vacuum.
	CRS	Direct the Auxiliary Operator to respond to bearing #5 and investigate cause of low seal pressure and restore pressure to 1-2 psig. Instruct him to bypass the regulator if necessary.
	CBOT	Set the Transient Low Vacuum Alarm on PMS
	CBOT	Verify all waterbox inlet valves open and all available circulating water pumps running.
	CRS	Direct the Auxiliary Operator to verify proper operation of the condenser vacuum pump.
	CBOT	Verify Gland Seal Steam Header pressure >75 psig.
IA NOTE: After ~3 minutes from the time the AO was directed to investigate #5 bearing seal pressure, restore gland seal steam to #5 bearing. **IRF GS6826_1 1** **DMF MC088**		
	CBOT	Report condenser vacuum recovering.
-Continued-		

Op-Test No: 2005-1 Scenario No: 4 (SPARE) Event No: 3, 4 Event Description: Condenser vacuum leak caused by the failure of the #5 turbine bearing gland seal regulator. Power reduction to stabilize vacuum		
Time	Position	Applicant's Actions or Behavior
	CRS	Direct the CBOR to stop the power reduction.
	CBOR	Stop the power reduction by using the ULD and matching the "position" and "measured variable" using the toggle switch.
EVENT TERMINATION Condenser vacuum recovering and power reduction stopped **OR** Next Event		

Op-Test No: 2005-1 Scenario No: 4 (SPARE) Event No: 5 Event Description: Operating MU/HPI pump experiences high winding temperature and causes the pump to trip. The standby pump has no oil indicated in one of the oil bubblers and must have oil added prior to start.		
Time	Position	Applicant's Actions or Behavior
T~45	CBOR	Acknowledge and report annunciator alarm K10-E7, HPI PUMP MTR WDG TEMP HI.
	CRS	Direct the crew per Annunciator Corrective Action,1203.012I for K10-E7.
	CBOT	Determine which pump is in alarm by checking Reactor Coolant, Makeup and Decay Heat Pumps Motor Winding Temperatures recorder (TR-6501) on C13.
NOTE: The operating makeup pump may trip before the crew can take the actions to start the standby pump.		
	CRS	Direct the CBOT to start the standby makeup pump and then stop the running pump.
	CBOT	Start P64B, Aux L.O. pump for the standby M/U pump.
	CBOT	Start P36B, Standby M/U pump. Stop P64B.
	CBOT	Start the Aux. L.O. pump for the pump to be stopped.
	CBOT	Stop the M/U pump with the high temperature.
NOTE: If the running M/U pump trips before the crew stops it, the following actions should be performed:		
	CBOR	Acknowledge and report annunciator K10-A6, HPI PUMP TRIP.
	CRS	Direct the crew per Abnormal Operating Procedure 1203.026, Loss of Reactor Coolant Makeup. **Tech Specs. 3.5.2.A ECCS - Operating**
-Continued-		

Op-Test No: 2005-1 Scenario No: 4 (SPARE) Event No: 5 Event Description: Operating MU/HPI pump experiences high winding temperature and causes the pump to trip. The standby pump has no oil indicated in one of the oil bubblers and must have oil added prior to start.		
Time	Position	Applicant's Actions or Behavior
	CBOT	Isolate letdown by performing either of the following: • Close Letdown Coolers Outlet (CV-1221), • Close Letdown Cooler Outlets (RCS) (CV-1214 and CV-1216).
	CBOR	Verify RC pump seals are being cooled by ICW.
	CBOR	Place the following valves in "HAND" AND close: • RC Pumps Total INJ Flow (CV-1207) • Pressurizer Level Control (CV-1235)
	CBOR	Verify RCP Seal Injection Block (CV-1206) closes.
	CBOT	Select Safety System Diagnostic Inst display on SPDS for OP HPI pump AND evaluate suction pressure and flow stability prior to event.
	CRS	Contact the Waste Control Operator to perform pre-start checks on the standby makeup pump.
IA NOTE: Call as the WCO and report the standby pump needs oil added to one of the bearing bubblers prior to start. Wait ~ 3 minutes and inform the control room the pump is ready to start.		
	CBOT	Start Aux lube oil pump for STBY HPI pump.
CT	CBOT	WHEN Aux lube oil pump has run for ≥1 minute, THEN start the standby HPI pump.
	CBOT	Stop Aux lube oil pump for HPI pump.
	CBOR	Place CV-1206 pushbutton in OVRD (OVRD light on). Open CV-1206.
-Continued-		

Op-Test No: 2005-1 Scenario No: 4 (SPARE) Event No: 5 Event Description: Operating MU/HPI pump experiences high winding temperature and causes the pump to trip. The standby pump has no oil indicated in one of the oil bubblers and must have oil added prior to start.		
Time	Position	Applicant's Actions or Behavior
	CBOR	Slowly open CV-1207 as follows: A. IF seal bleedoff temperature is >180°F, THEN establish and maintain 8 to 12 gpm RCP Seal Total Injection Flow until <180°F. B. WHEN seal bleedoff temperature is <180°F, THEN adjust CV-1207 for 30-40 gpm C. Place CV-1207 in AUTO.
	CBOR	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).
	CBOR	Slowly open CV-1235 until makeup flow indication is on-scale. Adjust CV-1235 setpoint to desired value. Place CV-1235 in AUTO.
	CBOR	Reestablish letdown.
EVENT TERMINATION Standby M/U pump in service and letdown, makeup, and seal injection restored.		

Op-Test No: 2005-1 Scenario No: 4 (SPARE) Event No: 6, 7, 8		
Event Description:	Main steam safety valve associated with 'B' OTSG experiences structural failure and lifts. Steam Leak significant to warrant manual reactor trip. The main turbine fails to fully trip when the unit is tripped. One governor valve and one throttle valve fail to close, requiring the crew to shut the MSIV from the affected OTSG. EFW valves to "B" OTSG from P7B fail open and will not close from the handswitches	
Time	Position	Applicant's Actions or Behavior
T~60	CBOR	Acknowledge and report annunciator K07-C5, MSSV OPEN. **Tech Spec 3.7.1.A Main Steam Safety Valves (MSSVs)**
	CRS	Direct the Auxiliary Operator to verify steam from the MSSV in the penthouse area.
	CRS	Direct actions per ACA 1203.012F, for K07-C5.
	CRS	Direct the CBOR to begin a power reduction.
	CBOR	Using the ULD toggle switch, reduce load demand.
ROLE PLAY: Call as the AO and report steam coming from the MSSV piping and coming from the sides of the penthouse.		
	CRS	Based on the severity of the steam leak, direct the crew to perform a reactor trip and carry out the immediate actions.
	CBOR	Depress the Reactor Trip P/B on C03, verify all rods inserted and reactor power dropping.
	CBOT	Depress the Turbine Trip P/B on C01, verify all governor valves and throttle valves close.
	CBOT	Recognize that a governor and throttle valve fail to close and position himself at C09 to perform MSLI for the affected OTSG. Report to the CRS the failure of the valves to close.
	CRS	Direct the CBOT to actuate MSLI for the affected OTSG.
-Continued-		

Op-Test No: 2005-1 Scenario No: 4 (SPARE) Event No: 6, 7, 8 Event Description: Main steam safety valve associated with 'B' OTSG experiences structural failure and lifts. Steam Leak significant to warrant manual reactor trip. The main turbine fails to fully trip when the unit is tripped. One governor valve and one throttle valve fail to close, requiring the crew to shut the MSIV from the affected OTSG. EFW valves to "B" OTSG from P7B fail open and will not close from the handswitches		
Time	Position	Applicant's Actions or Behavior
	CBOT	Actuate MSLI for the OTSG with the lowest pressure and EFW from the remote switch matrix on C09. Verify proper actuation per RT6. **EAL NUE 3.1 Uncontrolled OTSG Depressurization Resulting in MSLI Actuation**
	CRS	Transition to the Overcooling EOP, 1202.003 and provide direction to the crew.
	CBOR	Recognize the EFW valves to "B" OTSG from P7B have failed open and will not close using the controls on C09.
	CRS	Direct the CBOR to stop P7B after verifying P7A is operating properly.
CT	CBOR	Stop P7B by placing the handswitch on C09 in the P-T-L position.
	CBOR	When the "B" OTSG has boiled dry, verify and report the overcooling has been terminated
	CRS	Transition to step 25 of Overcooling EOP and direct the crew to stabilize the plant.
SCENARIO TERMINATION "B" OTSG is depressurized, EFW flow to "B" OTSG is stopped, and overcooling is terminated. **OR** As directed by the Lead Evaluator		