Facility: Arkansas Nuclear One Unit 2		Date of Examination: 01/28/2011
Examination Level: RO X SRO ☐		Operating Test Number: 2011-1
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
A1. Conduct of Operations 2.1.32 RO (3.8)	P/R	Apply limit and precautions to transferring Unit Auxiliaries to Start Up Transformer #2. ANO-2-JPM-NRC-ADMIN-SU2LOAD
A2. Conduct of Operations 2.1.37 RO (4.3)	D/R	Perform a dilution calculation (Manual method) ANO-2-JPM-NRC-ADMIN-CVCS6
A3. Equipment Control 2.2.37 RO (3.6)	N/R	Determine applicable Tech Specs for EFW ANO-2-JPM-NRC-ADMIN-EFWTS
A4. Radiation Control 2.3.15 RO (2.9)	N/R	Determine Condenser Off gas Radiation monitor setting. ANO-2-JPM-NRC-ADMIN-CRADMON
Emergency Procedures/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, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 2 **DATE:** _____

SYSTEM/DUTY AREA: Conduct of Operations A1

TASK: Perform Transferring Unit Auxiliaries from SU3 or Unit Aux to SU2

JTA#: ANO-RO-ELECD-NORM-026

KA VALUE RO: 3.8 **SRO:** 4.0 **KA REFERENCE:** 2.1.32

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 **CLASSROOM:** Perform

POSITION EVALUATED: RO: _____ **SRO:** _____

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

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): OP 2107.001 Attachment P

EXAMINEE'S NAME: _____ **Badge #** _____

EVALUATOR'S NAME: _____

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

SATISFACTORY: _____ **UNSATISFACTORY:** _____

PERFORMANCE CHECKLIST COMMENTS:

_____

_____

Start Time _____ **Stop Time** _____ **Total Time** _____

SIGNED: _____ **DATE:** _____

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

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

Mode 4; 250 EFPD. All ESF systems are in normal alignment.

Startup Transformer #3 is supplying all AC electrical busses.

Unit 1 is at 100% and all busses energized from their Unit Auxiliary Transformer.

Data from Feeder breaker 2A112: Vab = 4082VAC; Vbc=4050VAC; Vca=4102VAC

Data from Feeder breaker 2A113: Ic=1718amps, Ia=1715amps; Ib=1717amps;

Data from Feeder breaker 2A212: Vab = 4082VAC; Vbc=4050VAC; Vca=4102VAC

Data from Feeder breaker 2A213: Ic=1483amps, Ia=1480amps, Ib=1485amps;

TASK STANDARD:

Calculate Startup #2 loading to be 22.57 MVA (22.4 MVA to 22.8 MVA is acceptable) and determine that Startup #2 limits for forced oil and forced air cooling will be exceeded.

TASK PERFORMANCE AIDS: OP 2107.001 Limits and Precaution, Step 11.8, and Attachment 'P'.

SIMULATOR SETUP: N/A.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:
Maintenance on Startup Transformer #3 is planned and must be removed from service.

Perform OP 2107.001 Step 11.8.5 to determine if combined loads on 2A1 and 2A2 are within limits of Limit and Precaution Step 5.1.7 using Attachment P.

START TIME: _____

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1.	Calculated average Voltage on 2A1. (Att. P Step 1.2)	Calculated average voltage on 2A1 to be 4.078 KV (between 4.07 KV and 4.1 KV).	N/A SAT UNSAT
	2.	Calculate current on 2A1. (Att. P Step 1.3)	Calculated average current on 2A1 to be 1716.67 amps (between 1716 amps and 1717 amps).	N/A SAT UNSAT
	3.	Calculated 2A1 loading (Att. P Step 1.4)	Calculated loading on 2A1 to be 12.11 MVA (from 12 MVA to 12.2 MVA is acceptable)	N/A SAT UNSAT
	4.	Calculated average Voltage on 2A2. (Att. P Step 2.2)	Calculated average voltage on 2A2 to be 4.078 KV (between 4.07 KV and 4.1 KV).	N/A SAT UNSAT
	5.	Calculate current on 2A2. (Att. P Step 2.3)	Calculated current on 2A2 to be 1482.67 amps (between 1482 amps and 1483 amps.	N/A SAT UNSAT
	6.	Calculated 2A2 loading (Att. P Step 2.4)	Calculated loading on 2A2 to be 10.46 MVA (from 10.4 MVA to 10.6 MVA is acceptable)	N/A SAT UNSAT
(C)	7.	Total 4160 AC loading. (Att. P Step 3.0)	Calculated total 4160 AC loading to be 22.57 MVA (22.4 MVA to 22.8 MVA is acceptable).	N/A SAT UNSAT
(C)	8.	Compare calculated loading to limit and precaution step 5.1.7 of OP 2107.001.	Determined that limits for SU#2 loading with Forced oil and air cooling will be exceeded.	N/A SAT UNSAT
END				

STOP TIME: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINER's COPY

INITIAL CONDITIONS:

Mode 4; 250 EFPD. All ESF systems are in normal alignment.

Startup Transformer #3 is supplying all AC electrical busses.

Unit 1 is at 100% and all busses energized from their Unit Auxiliary Transformer.

Data from Feeder breaker 2A112: Vab = 4082VAC; Vbc=4050VAC; Vca=4102VAC

Data from Feeder breaker 2A113: Ic=1718amps, Ia=1715amps; Ib=1717amps;

Data from Feeder breaker 2A212: Vab = 4082VAC; Vbc=4050VAC; Vca=4102VAC

Data from Feeder breaker 2A213: Ic=1483amps, Ia=1480amps, Ib=1485amps;

Initiating CUE:

Maintenance on Startup Transformer #3 is planned and must be removed from service.

Perform OP 2107.001 Step 11.8.5 to determine if combined loads on 2A1 and 2A2 are within limits of Limit and Precaution Step 5.1.7 using Attachment P.

Check one:

Loads within Limits _____ Loads NOT within Limits _____┘_____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE's COPY

INITIAL CONDITIONS:

Mode 4; 250 EFPD. All ESF systems are in normal alignment.

Startup Transformer #3 is supplying all AC electrical busses.

Unit 1 is at 100% and all busses energized from their Unit Auxiliary Transformer.

Data from Feeder breaker 2A112: Vab = 4082VAC; Vbc=4050VAC; Vca=4102VAC

Data from Feeder breaker 2A113: Ic=1718amps, Ia=1715amps; Ib=1717amps;

Data from Feeder breaker 2A212: Vab = 4082VAC; Vbc=4050VAC; Vca=4102VAC

Data from Feeder breaker 2A213: Ic=1483amps, Ia=1480amps, Ib=1485amps;

Initiating CUE:

Maintenance on Startup Transformer #3 is planned and must be removed from service.

Perform OP 2107.001 Step 11.8.5 to determine if combined loads on 2A1 and 2A2 are within limits of Limit and Precaution Step 5.1.7 using Attachment P.

Check one:

Loads within Limits _____ Loads NOT within Limits _____

Key

ATTACHMENT P

SU TRANSFORMER LOAD CALCULATIONS

This attachment can be used to calculate total SU2 load prior to transfer to 2A1 and/or 2A2 or SU2 load when in service. It can also be used to calculate SU3 or Aux Transformer loading.

1.0 IF calculating 2A1 load,
THEN perform the following:

1.1 Record the following:

A. Bus voltage from Auxiliary Transformer Supply Breaker (2A-112):

Vab 4082 Vbc 4050 Vca 4102

B. N/A IF Auxiliary Transformer in service,
THEN record current readings from Supply Breaker (2A-112):

Ic _____ Ia _____ Ib _____

C. IF SU#3 Transformer in service,
THEN record current readings from Supply Breaker (2A-113):

Ic 1718 Ia 1715 Ib 1717

D. N/A IF SU#2 Transformer in service,
THEN record current readings from Supply Breaker (2A-111):

Ic _____ Ia _____ Ib _____

1.2 Determine Average Voltage for 2A1:

2A1 Voltage = (Vca + Vab + Vbc) ÷ 3,000 = 4.078 2A1 KV

1.3 Determine Average Current for 2A1:

2A1 Current = (Ia + Ib + Ic) ÷ 3 = 1716.67 2A1 Amps

1.4 Determine 2A1 Load:

2A1 Load = (2A1 KV) * (2A1 Amps) * (1.73) ÷ 1,000 = 12.11 2A1 MVA

2.0 IF calculating 2A2 load,
THEN perform the following:

2.1 Record the following:

A. Bus voltage from Auxiliary Transformer Supply Breaker (2A-212):

Vab 4082 Vbc 4050 Vca 4102

B. N/A IF Auxiliary Transformer in service,
THEN record current readings from Supply Breaker (2A-212):

Ic _____ Ia _____ Ib _____

C. IF SU#3 Transformer in service,
THEN record current readings from Supply Breaker (2A-213):

Ic 1483 Ia 1480 Ib 1485

D. N/A IF SU#2 Transformer in service,
THEN record current readings from Supply Breaker (2A-211):

Ic _____ Ia _____ Ib _____

Key

ATTACHMENT P

2.2 Determine Average Voltage for 2A2:

2A2 Voltage = (Vca + Vab + Vbc) ÷ 3,000 = 4.078 2A2 KV

2.3 Determine Average Current for 2A2:

2A2 current = (Ia + Ib + Ic) ÷ 3 = 1482.67 2A2 Amps

2.4 Determine 2A2 Load (KVA):

2A2 Load = (2A2 KV) * (2A2 Amps) * (1.73) ÷ 1,000 = 10.46 2A2 MVA

3.0 Determine Total 4160V AC Load that would be transferred as follows:

Total Load = 2A1 MVA + 2A2 MVA = 22.57 MVA

4.0 IF calculating 2H1 load,
THEN perform the following:

4.1 Record the following:

A. Bus voltage from Auxiliary Transformer Supply Breaker (2H-14):

Vab _____ Vbc _____ Vca _____

B. IF Auxiliary Transformer in service,
THEN record current readings from Supply Breaker (2H-14):

Ic _____ Ia _____ Ib _____

C. IF SU#3 Transformer in service,
THEN record current readings from Supply Breaker (2H-15):

Ic _____ Ia _____ Ib _____

D. IF SU#2 Transformer in service,
THEN record current readings from Supply Breaker (2H-13):

Ic _____ Ia _____ Ib _____

4.2 Determine Average Voltage for 2H1:

2H1 Voltage = (Vca + Vab + Vbc) ÷ 3,000 = _____ 2H1 KV

4.3 Determine Average Current for 2H1:

2H1 Current = (Ia + Ib + Ic) ÷ 3 = _____ 2H1 Amps

4.4 Determine 2H1 Load:

2H1 Load = (2H1 KV) * (2H1 Amps) * (1.73) ÷ 1,000 = _____ 2H1 MVA

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **ELECTRICAL SYSTEM OPERATIONS**	DOCUMENT NO. **2107.001**	CHANGE NO. **080**
	WORK PLAN EXP. DATE **N/A**	
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☐YES ☒NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these *TRAPS*	**Get these *TOOLS***
Time Pressure	**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**	**054**

5.1.7 SU2 Transformer MVA limits are listed below. MVA load can be calculated using Attachment P.

XFMR COOLING METHODS	XFMR Winding MVA Limit		
	161 KV	4160V	6900V
Forced air and oil cooling	45 MVA	21 MVA	25 MVA
Forced air cooling only	36 MVA	16.8 MVA	20 MVA
Natural Circ cooling only	27 MVA	12.6 MVA	15 MVA

5.1.8 SU2 will carry ESF buses of BOTH Unit 1 and Unit 2 with no cooling equipment available. If non-ESF loads supplied from SU2, then cooling equipment must be energized. (Normal Source is Unit 1 B-3213B, Backup Source is 2B42-E2)

5.1.9 {4.3.2} **Maintain SU2 handswitches in PTL UNLESS allowed by procedure OR a Design Engineering Evaluation. (ER973922E301 Design Engineering Evaluation allows SU2 handswitches NOT in PTL to A1/2A1.)**

5.1.10 WHEN SU2 transformer aligned for fast transfer to 2A1/2A2 (NOT in PTL)
AND being relied upon as preferred source,
THEN 2H1-2A1 OR 2H2-2A2 XFMR SELECT switch should be placed to SU2 as preferred source.

- This ensures fast transfer to SU2 if 2A1/2A2 supply breaker trips without U/V OR transformer lockout.

5.1.11 {4.3.2} **IF notified by system load dispatcher of any condition that could degrade offsite power sources (such as inoperability of ANO switchyard, Russellville East substation capacitor banks, SU2 voltage regulator OR SU3 voltage regulator), THEN operability of offsite power sources shall be assessed with Supplement 4 of this procedure.**

5.1.12 Any notification received from dispatcher regarding condition of offsite power sources shall be immediately communicated to Unit 1.

5.1.13 IF Unit at 100% power
AND plant loads supplied via SU#3 transformer OR swing connection to Unit Auxiliary Transformer,
THEN Main Transformer load will go up additional 4-5%.

- This will put loading to 108-112% of transformer rating.
- Transformer temperatures should be closely watched.
- Some slight Main Generator power reduction may be required to avoid transformer overheating.

11.8 IF bypassing SU2 load shed,
THEN transfer unit auxiliaries to SU2 as follows:

{4.3.2}

11.8.1 **Verify 500/161 KV Auto-transformer available unless Design Engineering Evaluation allows otherwise.**

11.8.2 **Verify Unit 1 Bus Feeder breakers from SU2 in PULL-TO-LOCK unless Design Engineering Evaluation allows otherwise:**

- H1 (H-13)
- H2 (H-23)
- A1 (A-111)
- A2 (A-211)

11.8.3 Place TWO Condensate pumps in PULL-TO-LOCK.

11.8.4 Verify ONE Circ Water pump (2P-3A/B) in PULL-TO-LOCK.

CAUTION

Using SU2 to supply four RCPs and one Circ Water pump overloads 6900V AC winding by 20%. This condition should NOT be allowed to exceed 8 hours.

11.8.5 Verify combined load on 2A1 and 2A2 within limits of step 5.1.7 using Attachment P.

11.8.6 Obtain Load Shed Bypass keys from SM.

11.8.7 At 2H-13 place Key Lock switch (143-2H09) in BYPASS.

11.8.8 At 2A-111 place Key Lock switch (143-2A16) in BYPASS.

11.8.9 Transfer selected buses from SU3 or Unit Aux to SU2 in any order as follows:

INSTRUCTIONS	2H1	2H2	2A1	2A2
A. Insert Synchronize switch in selected SU2 Feeder Breaker.	2H-13	2H-23	2A-111	2A-211
B. Place Synchronize switch to ON.	2H-13	2H-23	2A-111	2A-211
C. Verify Synchroscope between 11 and 1 O'clock position.				
D. Momentarily place SU2 Feeder Breaker to CLOSE.	2H-13 (152-13 CS)	2H-23 (152-23 CS)	2A-111 (152-111 CS)	2A-211 (152-211 CS)
E. Verify SU2 Feeder Breaker closes.	2H-13 (152-13 CS)	2H-23 (152-23 CS)	2A-111 (152-111 CS)	2A-211 (152-211 CS)
F. Check previously closed UA or SU3 Feeder Breaker opens.	2H-14/ 2H-15 (152-14 CS) / (152-15 CS)	2H-24/ 2H-25 (152-24 CS) / (152-25 CS)	2A-112/ 2A-113 (152-112 CS)/ (152-113 CS)	2A-212/ 2A-213 (152-212 CS)/ (152-213 CS)
G. IF previously closed breaker fails to open, THEN perform the following:				
1. Trip **SU2** Feeder Breaker.	2H-13 (152-13 CS)	2H-23 (152-23 CS)	2A-111 (152-111 CS)	2A-211 (152-211 CS)
2. GO TO step I.				
H. Momentarily place previously closed UA or SU3 Feeder Breaker in OPEN to Green Flag.	2H-14/ 2H-15 (152-14 CS) / (152-15 CS)	2H-24/ 2H-25 (152-24 CS) / (152-25 CS)	2A-112/ 2A-113 (152-112 CS)/ (152-113 CS)	2A-212/ 2A-213 (152-212 CS)/ (152-213 CS)
I. Place Synchronize switch to OFF and remove.	2H-13	2H-23	2A-111	2A-211

ATTACHMENT P

SU TRANSFORMER LOAD CALCULATIONS

This attachment can be used to calculate total SU2 load prior to transfer to 2A1 and/or 2A2 or SU2 load when in service. It can also be used to calculate SU3 or Aux Transformer loading.

1.0 IF calculating 2A1 load,
THEN perform the following:

1.1 Record the following:

A. Bus voltage from Auxiliary Transformer Supply Breaker (2A-112):

Vab _____ Vbc _____ Vca _____

B. IF Auxiliary Transformer in service,
THEN record current readings from Supply Breaker (2A-112):

Ic_____ Ia _____ Ib _____

C. IF SU#3 Transformer in service,
THEN record current readings from Supply Breaker (2A-113):

Ic _____ Ia _____ Ib _____

D. IF SU#2 Transformer in service,
THEN record current readings from Supply Breaker (2A-111):

Ic _____ Ia _____ Ib _____

1.2 Determine Average Voltage for 2A1:

2A1 Voltage = (Vca + Vab + Vbc) ÷ 3,000 = _____ 2A1 KV

1.3 Determine Average Current for 2A1:

2A1 Current = (Ia + Ib + Ic) ÷ 3 = _____ 2A1 Amps

1.4 Determine 2A1 Load:

2A1 Load = (2A1 KV) * (2A1 Amps) * (1.73) ÷ 1,000 = _____ 2A1 MVA

2.0 IF calculating 2A2 load,
THEN perform the following:

2.1 Record the following:

A. Bus voltage from Auxiliary Transformer Supply Breaker (2A-212):

Vab _____ Vbc _____ Vca _____

B. IF Auxiliary Transformer in service,
THEN record current readings from Supply Breaker (2A-212):

Ic_____ Ia _____ Ib _____

C. IF SU#3 Transformer in service,
THEN record current readings from Supply Breaker (2A-213):

Ic _____ Ia _____ Ib _____

D. IF SU#2 Transformer in service,
THEN record current readings from Supply Breaker (2A-211):

Ic _____ Ia _____ Ib _____

2.2 Determine Average Voltage for 2A2:

2A2 Voltage = (Vca + Vab + Vbc) ÷ 3,000 = _____ 2A2 KV

2.3 Determine Average Current for 2A2:

2A2 current = (Ia + Ib + Ic) ÷ 3 = _____ 2A2 Amps

2.4 Determine 2A2 Load (KVA):

2A2 Load = (2A2 KV) * (2A2 Amps) * (1.73) ÷ 1,000 = _____ 2A2 MVA

3.0 Determine Total 4160V AC Load that would be transferred as follows:

Total Load = 2A1 MVA + 2A2 MVA = _____ MVA

4.0 IF calculating 2H1 load,
THEN perform the following:

4.1 Record the following:

A. Bus voltage from Auxiliary Transformer Supply Breaker (2H-14):

Vab _____ Vbc _____ Vca _____

B. IF Auxiliary Transformer in service,
THEN record current readings from Supply Breaker (2H-14):

Ic_____ Ia _____ Ib _____

C. IF SU#3 Transformer in service,
THEN record current readings from Supply Breaker (2H-15):

Ic _____ Ia _____ Ib _____

D. IF SU#2 Transformer in service,
THEN record current readings from Supply Breaker (2H-13):

Ic _____ Ia _____ Ib _____

4.2 Determine Average Voltage for 2H1:

2H1 Voltage = (Vca + Vab + Vbc) ÷ 3,000 = _____ 2H1 KV

4.3 Determine Average Current for 2H1:

2H1 Current = (Ia + Ib + Ic) ÷ 3 = _____ 2H1 Amps

4.4 Determine 2H1 Load:

2H1 Load = (2H1 KV) * (2H1 Amps) * (1.73) ÷ 1,000 = _____ 2H1 MVA

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 04 **DATE:** _____

SYSTEM/DUTY AREA: Conduct of Operations A2

TASK: Perform a dilution calculation (Manual Method)

JTA#: ANO2-RO-CHADD-NORM-3

KA VALUE RO: 4.3 **SRO:** 4.6 **KA REFERENCE:** 2.1.37

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 **CLASSROOM:** Perform

POSITION EVALUATED: RO: _____ **SRO:** _____

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

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 10 minutes

REFERENCE(S): OP 2103.004 Attachment A.3 & C , OP 2102.016

EXAMINEE'S NAME: _____ **Badge #:** _____

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

INITIAL CONDITIONS:

OP 2102.016 Step 7.17 requires that RCS boron concentration be adjusted to the ECB value.

- Mode 3
- PZR level = 42%
- RCS pressure = 2200 psia
- Tave = 545°F
- VCT level = 65%,
- Present boron concentration = 750 ppm
- ECB is calculated to be 350 ppm

TASK STANDARD: The amount of water needed to dilute from actual to ECB boron concentration has been calculated using OP 2103.004 Attachment 'A.3' to be 44,227.3 gallons (44,149 gal. to 44,420 gal.)

TASK PERFORMANCE AIDS: Copy of Plant conditions and OP 2103.004 Attachment 'A.3' and Attachment C.

SIMULATOR INITIAL CONDITIONS: Plant is in hot standby condition.

JOB PERFORMANCE MEASURE

INITIATING CUE:
Using OP 2103.004 Attachment A.3 and Attachment C, determine the amount of dilution water required to bring RCS boron concentration to the given ECB concentration.

Start Time: _____

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1.	Record data from initial conditions. (Attachment A.3 Step 1.0)	Recorded the following: - 545°F (Tave) - 2200 psia (RCS Press) - 42% (PZR Level) - 65% (VCT Level) - 750 PPM (initial) - 350 PPM (final)	N/A SAT UNSAT
(C)	2.	Determine RCS mass for 42% PZR level in OP 2103.004 Attachment C. (Attachment A.3 Step 2.0)	Determined RCS mass from OP 2103.004 Attachment C. 481,980 lb	N/A SAT UNSAT
(C)	3.	Calculated Mass of DI water. (Attachment A.3 Step 3.0)	Calculate DI water Feed Mass: Mf = 481,980 ln (750/350) Mf = 367,336.3 lb (366,693 lb to 368,940 lb)	N/A SAT UNSAT
(C)	4.	Calculate DI water feed volume. (Attachment A.3 Step 4.0)	Calculate DI water feed volume: F = 367,336.3 (0.1204) F = 44,227.3 gal. (44,149 gal. to 44,420 gal.)	N/A SAT UNSAT
END				

Stop Time: _____

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

OP 2102.016 Step 7.17 requires that RCS boron concentration be adjusted to the ECB value.

- Mode 3
- PZR level = 42%
- RCS pressure = 2200 psia
- Tave = 545°F
- VCT level = 65%,
- Present boron concentration = 750 ppm
- ECB is calculated to be 350 ppm

INITIATING CUE:

Using OP 2103.004 Attachment A.3 and Attachment C, determine the amount of dilution water required to bring RCS boron concentration to the given ECB concentration.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

OP 2102.016 Step 7.17 requires that RCS boron concentration be adjusted to the ECB value.

- Mode 3
- PZR level = 42%
- RCS pressure = 2200 psia
- Tave = 545°F
- VCT level = 65%,
- Present boron concentration = 750 ppm
- ECB is calculated to be 350 ppm

INITIATING CUE:

Using OP 2103.004 Attachment A.3 and Attachment C, determine the amount of dilution water required to bring RCS boron concentration to the given ECB concentration.

Key

ATTACHMENT A.3

PAGE 1 OF 1

WORK SHEET FOR MAKEUP IN DILUTE MODE

NOTE

- Changes made affecting the calculation should be coordinated with Computer Support prior to implementation.
- The BORON2 program located on the plant computer is the preferred method for performing the calculations in this procedure. Manual calculations include assumptions for simplicity that result in slightly different calculated volumes than those calculated using BORON2 (see Limit and Precaution 5.2)

1.0 Record the following:

- RCS Temp. = 545 °F
- Pressurizer Level = 42 %
- VCT Level = 65 %
- Initial RCS Boron Conc. (Cr_i) = 750 ppm
- Final Desired RCS Boron Conc. (Cr_F) = 350 ppm

2.0 Determine the RC Mass from Attachment C:

Mass of Reactor Coolant (Mr) = 481,980 lb.

3.0 Calculate the DI Water Feed Mass (M_f):

$$M_f = M_r \ln \left[\frac{Cr_i}{Cr_F}\right]$$

$$M_f = (481,980) \ln \left(\frac{750}{350}\right)$$

M_f = 367336.3 lb.

4.0 Calculate the DI Water Feed Volume (F) that must be fed to change the boron concentration from Cr_i to Cr_F:

$F = M_F V_F$ (7.48)

V_F = Specific Volume of Feed @80°F(ft^3/lb.)= 0.0161 ft^3/lb.

F = (367336.3 lb.)(0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = (367336.3 lb.)(0.1204)

F = 44227.3 gal. DI water

Performed By: _____ Time: _____ Date: _____

Supervisor Review: _____ Date: _____

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **SOLUBLE POISON CONCENTRATION CONTROL**

SET #

DOCUMENT NO.	CHANGE NO.
2103.004	**010**
WORK PLAN EXP. DATE **N/A**	
SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
TEMP MOD ☐YES ☒NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these *TRAPS*

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

Get these *TOOLS*

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

VERIFIED BY	DATE	TIME

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

ATTACHMENT A.3

WORK SHEET FOR MAKEUP IN DILUTE MODE

NOTE

- Changes made affecting the calculation should be coordinated with Computer Support prior to implementation.
- The BORON2 program located on the plant computer is the preferred method for performing the calculations in this procedure. Manual calculations include assumptions for simplicity that result in slightly different calculated volumes than those calculated using BORON2 (see Limit and Precaution 5.2)

1.0 Record the following:

- RCS Temp. = _____°F
- Pressurizer Level = _____%
- VCT Level = _____%
- Initial RCS Boron Conc.(Cr_i) = _____ppm
- Final Desired RCS Boron Conc.(Cr_F) = _____ppm

2.0 Determine the RC Mass from Attachment C:

Mass of Reactor Coolant (Mr) = _____lb.

3.0 Calculate the DI Water Feed Mass (M_f):

$$M_f = M_r \ln \left[\frac{Cr_i}{Cr_F}\right]$$

M_f = (_____) ln (_____)
( )

M_f = _____lb.

4.0 Calculate the DI Water Feed Volume (F) that must be fed to change the boron concentration from Cr_i to Cr_F:

$F = M_F V_F (7.48)$

V_F = Specific Volume of Feed @80°F(ft^3/lb.)= 0.0161 ft^3/lb.

F = (_____lb.)(0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = (_____lb.)(0.1204)

F = _____gal. DI water

Performed By: _____ Time: _____ Date: _____

Supervisor Review: _____ Date: _____

ATTACHMENT C

REACTOR COOLANT MASS TABLE

ANO - UNIT 2
MR (MASS OF REACTOR COOLANT AT GIVEN TEMP., LBS.)

PZR PRESSURE	250 psia	250 psia	250 psia	250 psia	1000 psia	2200 psia
PZR LEVEL (%)	100˚F	140˚F	200˚F	240˚F	300˚F	545˚F
0	632,303	626,598	614,668	604,785	556,500	462,894
2	633,589	627,885	615,957	606,075	557,617	463,803
4	634,874	629,172	617,246	607,365	558,733	464,711
6	636,160	630,459	618,535	608,656	559,850	465,620
8	637,446	631,746	619,824	609,946	560,966	466,529
10	638,731	633,033	621,113	611,237	562,083	467,438
12	640,017	634,320	622,402	612,527	563,199	468,347
14	641,303	635,607	623,691	613,817	564,315	469,256
16	642,588	636,894	624,980	615,108	565,432	470,165
18	643,874	638,181	626,269	616,398	566,548	471,074
20	645,160	639,468	627,558	617,689	567,665	471,982
22	646,445	640,755	628,847	618,979	568,781	472,891
24	647,731	642,042	630,137	620,270	569,898	473,800
26	649,017	643,329	631,426	621,560	571,014	474,709
28	650,302	644,616	632,715	622,850	572,131	475,618
30	651,588	645,903	634,004	624,141	573,247	476,527
32	652,874	647,190	635,293	625,431	574,364	477,436
34	654,159	648,477	636,582	626,722	575,480	478,345
36	655,445	649,764	637,871	628,012	576,596	479,253
38	656,731	651,051	639,160	629,302	577,713	480,162
40	658,016	652,338	640,449	630,593	578,829	481,071
42	659,302	653,626	641,738	631,883	579,946	481,980
44	660,588	654,913	643,027	633,174	581,062	482,889
46	661,873	656,200	644,316	634,464	582,179	483,798
48	663,159	657,487	645,605	635,754	583,295	484,707

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 2 **DATE:** _____

SYSTEM/DUTY AREA: Equipment controls A3

TASK: Determine EFW TS applicability.

JTA#: ANO2-RO-EFW-SURV-51

KA VALUE RO: 3.6 **SRO:** 4.6 **KA REFERENCE:** 2.2.37

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 **CLASSROOM:** Perform

POSITION EVALUATED: RO: _____ **SRO:** _____

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

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): 2106.006, Emergency Feedwater System Operation, 2104.036 Emergency Diesel Operations, Unit 2 Tech Specs.

EXAMINEE'S NAME: _____ **Badge #:** _____

EVALUATOR'S NAME: _____

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

SATISFACTORY: _____ **UNSATISFACTORY:** _____

PERFORMANCE CHECKLIST COMMENTS:

_____

_____

Start Time _____ **Stop Time** _____ **Total Time** _____

SIGNED: _____ **DATE:** _____

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

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Plant is in Mode 1.
- PPS Matrix Testing is in progress and all administrative requirements are satisfied including TS entry.
- When 2CV-1037-1 (2P-7A Feed to A S/G) is fully closed by PPS Matrix Testing the feeder breaker trips.
- The Inside AO reports an oil leak on #2 EDG governor and the oil level is below indicating range.

TASK STANDARD:

Determined that #2 EDG and Green Train of EFW are NOT operable and that TS 3.8.1.1 and TS 3.7.1.2 are applicable.

TASK PERFORMANCE AIDS:

OP 2106.006, Emergency Feedwater operations, OP-2104.036 Emergency Diesel operations, Unit 2 Tech Specs.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

Determine the status of #2 EDG and the Green Train of EFW and any Technical Specifications that are applicable for the given plant conditions using 2106.006 Emergency Feedwater System Operations, 2104.036 Emergency Diesel Generator Operations, and Unit 2 Tech Specs. Do not include PPS Tech Specs.

START TIME: _____

	PERFORMANCE CHECKLIST	STANDARD	(Circle One)
	1. Review OP 2106.006, Emergency Feedwater System Operation, Attachment D, and Technical Specifications.	Examinee reviewed the Emergency feedwater System Operation and Tech Specs.	N/A SAT UNSAT
(C)	2. Using 2104.036 Limit and Precaution 5.22 determines #2 EDG operability. (OP 2104.036 Step 5.22 3rd bullet)	Examinee determined that #2 EDG is inoperable.	N/A SAT UNSAT
(C)	3. Using Attachment D of 2106.006 determines Green Train EFW operability. (2106.006 Att. D Step 1.3)	Examinee determined that the Green Train of EFW is NOT operable because 2CV-1037-1 is closed in Mode 1.	N/A SAT UNSAT
(C)	4. Determine applicable Technical Specifications. (TS 3.8.1.1 and TS 3.7.1.2)	Determined the following Technical Specifications must be entered: TS 3.8.1.1 is applicable. TS 3.7.1.2 is applicable.	N/A SAT UNSAT
Examiner note: The examinee may mention TS 3.4.4 for proportional heater and TS 3.6.3.1 for containment isolation but are not required.			
END			

STOP TIME: _____

EXAMINER'S COPY

INITIAL CONDITIONS:

- Plant is in Mode 1.
- PPS Matrix Testing is in progress and all administrative requirements are satisfied including TS entry.
- When 2CV-1037-1 (2P-7A Feed to A S/G) is fully closed by PPS Matrix Testing the feeder breaker trips.
- The Inside AO reports an oil leak on #2 EDG governor and the oil level is below indicating range.

INITIATING CUE:

Determine the status of #2 EDG and the Green Train of EFW and any Technical Specifications that are applicable for the given plant conditions using 2106.006 Emergency Feedwater System Operations, 2104.036 Emergency Diesel Generator Operations, and Unit 2 Tech Specs. Do not include PPS Tech Specs.

#2 EDG Operable? YES/(NO) (Circle One)

Green Train of EFW Operable? YES/(NO) (Circle One)

Applicable Tech Specs: TS 3.8.1.1 and TS 3.7.1.2.

EXAMINEE'S COPY

INITIAL CONDITIONS:

- Plant is in Mode 1.
- PPS Matrix Testing is in progress and all administrative requirements are satisfied including TS entry.
- When 2CV-1037-1 (2P-7A Feed to A S/G) is fully closed by PPS Matrix Testing the feeder breaker trips.
- The Inside AO reports an oil leak on #2 EDG governor and the oil level is below indicating range.

INITIATING CUE:

Determine the status of #2 EDG and the Green Train of EFW and any Technical Specifications that are applicable for the given plant conditions using 2106.006 Emergency Feedwater System Operations, 2104.036 Emergency Diesel Generator Operations, and Unit 2 Tech Specs. Do not include PPS Tech Specs.

#2 EDG Operable? YES/NO (Circle One)

Green Train of EFW Operable? YES/NO (Circle One)

Applicable Tech Specs: _____.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 2 **DATE:** _____

SYSTEM/DUTY AREA: Radiation Control A4

TASK: Determine Condenser off gas radiation monitor setting.

JTA#: ANO2-RO-RMS-OFFNORM-13

KA VALUE **RO:** 2.9 **SRO:** 3.1 **KA REFERENCE:** 2.3.15

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 **CLASSROOM:** Perform

POSITION EVALUATED: **RO:** _____ **SRO:** _____

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

TESTING METHOD: **SIMULATE:** _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): 2105.016, Radiation Monitoring and Evacuation system. Unit 2 OPS B2 CBO Log.

EXAMINEE'S NAME: _____ **Badge #:** _____

EVALUATOR'S NAME: _____

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

SATISFACTORY: _____ **UNSATISFACTORY:** _____

PERFORMANCE CHECKLIST COMMENTS:

_____

_____

Start Time _____ **Stop Time** _____ **Total Time** _____

SIGNED: _____ **DATE:** _____

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

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Unit 2 is in Mode 1.
- 2K11-A10 Secondary System radiation hi alarm is locked in due to 2RITS-0645 Condenser off gas radiation monitor.
- Crew has entered Primary to Secondary leakage AOP due to a small primary to secondary leak that does not require a shutdown.
- The 2RITS-0645 was logged reading 400 CPM on the OPS-B2 CBO log.

TASK STANDARD:

Determine the new potentiometer setting for the alarm setpoint of 2RITS-0645 (potentiometer setting: 3.62) and the new voltage setting for 2RR-1057 (1.845) Secondary Radiation Recorder.

TASK PERFORMANCE AIDS:

2105.016, Radiation Monitoring and Evacuation system, and Unit 2 OPS-B2 CBO Log

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

Determine the new potentiometer setting of 2RITS-0645, Condenser Off Gas Radiation Monitor, and voltage setting for 2RR-1057, Secondary Radiation Recorder, IAW 2105.016, Radiation Monitoring and Evacuation System, and OPS-B2 CBO log. The SM has approved a procedure deviation to skip the step to adjust 2RITS-0645 potentiometer until after the voltage reading is obtained for 2RR-1057.

START TIME: _____

	PERFORMANCE CHECKLIST	STANDARD	(Circle One)
(C)	1. Determine new high alarm setpoint for 2RITS-0645 from CBO Electrical and CAMS Log (OPS-B2). Verify setpoint within the following limits: - Minimum high alarm setpoint of 250 cpm - Smaller of 2 times background or 300 cpm above background	Examinee reviewed the Unit 2 OPS-B2 CBO Log and 2105.016 and determined that the new alarm set point should be 700 cpm.	N/A SAT UNSAT
(C)	2. Determine potentiometer dial setting which corresponds to desired high alarm setpoint from Table 1.	Examinee determined the new setting for 2RITS-0645 is 3.62 from Table 1.	N/A SAT UNSAT
(C)	3. Determine voltage setting which corresponds to desired high alarm setpoint from Table 2.	Examinee determined the new setting for 2RR-1057 is 1.845 from Table 2.	N/A SAT UNSAT
END			

STOP TIME: _____

EXAMINER'S COPY

INITIAL CONDITIONS:

- Unit 2 is in Mode 1.
- 2K11-A10 Secondary System radiation hi alarm is locked in due to 2RITS-0645 Condenser off gas radiation monitor.
- Crew has entered Primary to Secondary leakage AOP due to a small primary to secondary leak that does not require a shutdown.
- The 2RITS-0645 was logged reading 400 CPM on the OPS-B2 CBO log.

INITIATING CUE:

Determine the new potentiometer setting of 2RITS-0645, Condenser Off Gas Radiation Monitor, and voltage setting for 2RR-1057, Secondary Radiation Recorder, IAW 2105.016, Radiation Monitoring and Evacuation System, and OPS-B2 CBO log. The SM has approved a procedure deviation to skip the step to adjust 2RITS-0645 potentiometer until after the voltage reading is obtained for 2RR-1057.

2RITS-0645 potentiometer setting: 3.62

2RR-1057 voltage setting: 1.845

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

`INITIAL CONDITIONS:

- Unit 2 is in Mode 1.
- 2K11-A10 Secondary System radiation hi alarm is locked in due to 2RITS-0645 Condenser off gas radiation monitor.
- Crew has entered Primary to Secondary leakage AOP due to a small primary to secondary leak that does not require a shutdown.
- The 2RITS-0645 was logged reading 400 CPM on the OPS-B2 CBO log.

INITIATING CUE:

Determine the new potentiometer setting of 2RITS-0645, Condenser Off Gas Radiation Monitor, and voltage setting for 2RR-1057, Secondary Radiation Recorder, IAW 2105.016, Radiation Monitoring and Evacuation System, and OPS-B2 CBO log. The SM has approved a procedure deviation to skip the step to adjust 2RITS-0645 potentiometer until after the voltage reading is obtained for 2RR-1057.

2RITS-0645 potentiometer setting: _____

2RR-1057 voltage setting: _____

2RITS-8233 READING **REQUIRED** **Seq:** 51 Every Day 137

Equip. ID: 2-RMS -SWITCH-2RITS-8233 **Location:** CR2-386-2C25

Short Instr: MAX=2X BACKGROUND TS 3.3.3.1 ODCM L2.2.1.

Units: CPM

Shift Time	Reading	Notes	Recorded By
Days			
Nights			
Extra Set 1			
Extra Set 2			

SETPOINT FOR 2RITS-0645 **REQUIRED** **Seq:** 52 Every Day 136

Location: CR2-386-2C25

Short Instr: SEE LONG INSTRUCTION FOR MAX CRITERIA

Long Instr: IF COND VAC PUMP IS IN OPERATION, THEN THE HIGH ALARM SETPT SHALL BE THE SMALLER OF 2X BACKGROUND OR APP 300 CPM ABOVE BKGRD. MINIMUM SETPOINT IS 250 CPM.

Units: CPM **Minimum:** >= 250

Shift Time	Reading	Notes	Recorded By
Days	250		JR
Nights			
Extra Set 1			
Extra Set 2			

2RITS-0645 READING COND VAC **REQUIRED** **Seq:** 53 Every Day 135

Equip. ID: 2-RMS -SWITCH-2RITS-0645 **Location:** CR2-386-2C25

Short Instr: 2RITS-0645

Units: CPM **Maximum:** <= <EXPR>

Shift Time	Reading	Notes	Recorded By
Days	400		JR
Nights			
Extra Set 1			
Extra Set 2			

Order	Description	Expression	Text	Color
1	EXCEEDS HIGH ALARM SETPOINT	n(sta(135))>N(STA(136))	EXCEEDS HIGH ALARM SETPOINT	

Max. Expr.: N(STA(136))

WASTE GAS DISCHARGE **REQUIRED** **Seq:** 54 Every Day 134

Equip. ID: 2-RMS -SWITCH-2RITS-2429 **Location:** CR2-386-2C25

Short Instr: ODCM App 2, Table 2.2-2. ODCM App 2, L2.4.1.A, L2.4.2.A, L2.4.3.A, and L2.1.1. (ANO-91-05604) SEE LONG INST.

Long Instr: ODCM App 2, Table 2.2-2. IF 2RITS-2429 >= 8.9 E+5, THEN declare monitor inoperable and refer to ODCM App 2, L2.4.1.A, L2.4.2.A, L2.4.3.A, and L2.1.1. (ANO-91-05604)

If background reading drops significantly from previous readings, initiate actions to refill loop seals at 2FIT-2430 and 2RITS-2429. (CR-2-97-0037-03)

Units: CPM **Maximum:** <= 890000

Shift Time	Reading	Notes	Recorded By
Days			
Nights			
Extra Set 1			
Extra Set 2			

Order	Description	Expression	Text	Color
1	OOS HIGH	N(STA(134))>890000	ODCM App 2, Table 2.1-2. IF 2RITS-2429 >= 8.9 E+5, THEN declare monitor inoperable and refer to ODCM App 2, L2.4.1.A, L2.4.2.A, L2.4.3.A, and L2.1.1. (ANO-91-05604)	

Facility: Arkansas Nuclear One Unit 2 Date of Examination: 01/28/2011

Examination Level: RO ☐ SRO X Operating Test Number: 2011-1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
A5. Conduct of Operations 2.1.23 SRO (4.4)	D/R	Review CEA#1 Upper Gripper Coil Temperature Data and determine correct temperature. ANO-2-JPM-NRC-ADMIN-XTCEA
A6. Conduct of Operations 2.1.29 SRO (4.0)	D/R	Review CCW system line up to normal operation. ANO-2-JPM-NRC-ADMIN-CCWVLVLU
A7. Equipment Control 2.2.37 SRO (4.6)	N/R	Determine applicable Tech Spec for Control Room Ventilation. ANO-2-JPM-NRC-ADMIN-CREVSTS
A8. Radiation Control 2.3.14 SRO (3.8)	P/R	Approve administration of Potassium Iodide. ANO-2-JPM-NRC-ADMIN-KI
A9. Emergency Procedures/Plan 2.4.41 SRO (4.6)	D/R	Determine Emergency Action Level for given conditions. ANO-2-JPM-NRC-ADMIN-EAL11

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

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

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 3 **DATE:** _____

SYSTEM/DUTY AREA: Conduct of Operations A5

TASK: Verify and determine CEA#1 Upper Gripper Coil Temperature

JTA#: ANO2-RO-CEDM-NORM-10

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

APPROVED FOR ADMINISTRATION TO: **RO:** _____ **SRO:** X

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

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: _____ **SIMULATOR:** Perform **CLASSROOM:** Perform

POSITION EVALUATED: **RO:** _____ **SRO:** _____

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

TESTING METHOD: **SIMULATE:** _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): OP 2105.009

EXAMINEE'S NAME: _____ **BADGE # :** _____

EVALUATOR'S NAME: _____

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

SATISFACTORY: _____ **UNSATISFACTORY:** _____

PERFORMANCE CHECKLIST COMMENTS:

_____

_____

Start Time _____ **Stop Time** _____ **Total Time** _____

SIGNED: _____ **DATE:** _____

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

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Plant is at full power.
- Both Main Chillers have tripped and cannot be started.
- I&C are not available to obtain CEDM Coil temperatures.
- OP 2203.012M, 2K13 ACA, for window C4, CEDM cooling coils water flow low ACA
- is in alarm.
- Readings obtained from the CEDM coil using a calibrated DVM are:
  1) Upper Gripper coil voltage, V_{ug} = 44V;
  2) Upper Gripper Shunt voltage V_{shunt} = 6.46 mV

TASK STANDARD:

Determined transposition error of 8.46mV was recorded instead of the 6.46mV in step 4.3.1

And

Correct CEA 01 upper gripper coil temperature of ≥500.050°F.

TASK PERFORMANCE AIDS:

1. OP 2105.009 Exhibit 2 (completed)
2. Calculator.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

As directed by OP 2203.012M, 2K13-C4, CEDM Cooling coils Water Flow Low ACA, the Upper Gripper temperature for CEA 01 has been calculated using 2105.009, Exhibit 2.

Identify and correct any errors determined on 2105.009 Exhibit 2

START TIME: _____

PERFORMANCE CHECKLIST			PERFORMANCE STANDARDS	(Circle One)
(C)	1. (Step 4.0)	Transposition error present on Exhibit 2 which causes the final answer to be incorrect: 1. 8.46mV was recorded instead of the 6.46mV in step 4.3.1.	Identified transposition error in step 4.3.1 on the completed Exhibit 2.	N/A SAT UNSAT
	2 (Steps 5.0, 6.0 & 7.0)	1. 4.23 Amps was recorded instead of 3.23 Amps in step 5.2. 2. 10.4 ohms was recorded instead of 9.88 ohms in step 6.3. (0.525 should have been subtracted from 10.4.). 3. Temperature of upper gripper coil was recorded as 353.373°F (value for 10.9 ohms) instead of 320.038°F (value for 10.4 ohms). It is acceptable to correctly calculate and identify the correct values throughout the exhibit instead of identifying errors in calculation execution in given exhibit. Refer to "Correct KEY Exhibit 2".	Errors made due to the transposition error above identified during the recalculation of the final resistance reading.	N/A SAT UNSAT
(C)	3. (Step 7.0)	Calculates correct CEA 01 upper gripper coil resistance of 13.1ohms and determines the CEA 01 temperature to be 506.665°F.	Calculated the correct CEA 01 upper gripper coil resistance as 13.1 (13.09 to 13.1) ohms and determined CEA01 coil temperature as 506.665°F (acceptance criteria is ≥ 506°F).	N/A SAT UNSAT
END				

STOP TIME: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINER's COPY

INITIAL CONDITIONS:

- Plant is at full power.
- Both Main Chillers have tripped and cannot be started.
- I&C are not available to obtain CEDM Coil temperatures.
- OP 2203.012M, 2K13 ACA, for window C4, CEDM cooling coils water flow low ACA is in alarm.
- Readings obtained from the CEDM coil using a calibrated DVM are:
  1) Upper Gripper coil voltage, V_{ug} = 44V
  2) Upper Gripper Shunt voltage V_{shunt} = 6.46 mV

INITIATING CUE:

As directed by OP 2203.012M, 2K13-C4, CEDM Cooling coils Water Flow Low ACA, the Upper Gripper temperature for CEA 01 has been calculated using 2105.009, Exhibit 2.

Identify and correct any errors determined on 2105.009 Exhibit 2

CEA 01 Upper Gripper Coil Temperature _____.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE's COPY

INITIAL CONDITIONS:

- Plant is at full power.
- Both Main Chillers have tripped and cannot be started.
- I&C are not available to obtain CEDM Coil temperatures.
- OP 2203.012M, 2K13 ACA, for window C4, CEDM cooling coils water flow low ACA is in alarm.
- Readings obtained from the CEDM coil using a calibrated DVM are:
  1) Upper Gripper coil voltage, V_{ug} = 44V
  2) Upper Gripper Shunt voltage V_{shunt} = 6.46 mV

INITIATING CUE:

As directed by OP 2203.012M, 2K13-C4, CEDM Cooling coils Water Flow Low ACA, the Upper Gripper temperature for CEA 01 has been calculated using 2105.009, Exhibit 2.

Identify and correct any errors determined on 2105.009 Exhibit 2

CEA 01 Upper Gripper Coil Temperature _____.

Key

2105.009 EXHIBIT 2 Revised 09/22/05

CEA #01 UPPER GRIPPER COIL TEMPERATURE MEASUREMENT

This exhibit provides Operations the ability to measure and trend CEA-01 upper gripper coil temperature. Other historically hot CEAs (2, 4, 8, 14, 15, 18, 55, 63, and 72) can also be measured by referring to WO# 50654677 CR-ANO-2-1999-0433-004.

1.0 Obtain currently calibrated Handheld Digital Voltmeter (DVM) or equivalent multimeter (Refer to 2OPG-012 for DVM usage).

NOTE

- Hold bus voltage prevents obtaining proper temperature readings.
- Record absolute values of voltage readings obtained.

2.0 Check CEA #01 NOT on Hold Bus.

3.0 Obtain CEA #01 Upper Gripper coil voltage (V_{ug}) as follows:

3.1 Locate CEA #1 power cables in panel on TBC4C6, (behind access panel to left of 2C72 door).

3.2 With DVM scale set on 200, take voltage reading across "Black" and "White" cables located on TBC4C6, terminals #4 and #5. (A typical reading is 44 VDC).

(V_{ug}) = 44 V

4.0 Obtain CEA #01 Upper Gripper shunt voltage (V_{shunt}) as follows:

4.1 Locate CEA #01 coil monitor connector on front side of 2C72. (This is a round, capped connector with (#1) located directly above it.

4.2 Remove connector cap by unscrewing.

4.3 With DVM scale set on 200mV, take voltage reading across pins "C" and "D". (A typical reading is 8 millivolts DC.)

4.3.1 Record DVM reading = 6.46 mV

Convert mV to Volts: 6.46 mV X $\frac{1\ V}{1000\ mV}$ = 0.00646 V

Record (V_{shunt}) = 0.00646 V

4.4 Screw connector cap back on CEA #01 coil monitor connector.

5.0 Utilize ohms law to calculate coil current (Icoil) as follows.

5.1 (Icoil) = (Vshunt) 0.00646 V ÷ .002 ohms.

5.2 (Icoil) = 3.23 amps

6.0 Calculate coil resistance ($Rcoil_1$) as follows:

6.1 ($Rcoil_1$) = (Vug) 44 V ÷ (Icoil) 3.23 amps

($Rcoil_1$) = 13.62 ohms

NOTE

Lead resistance must be subtracted to obtain accurate reading. Lead resistance for CEA #1 is provided in this calculation. However, a lookup table for lead resistance is provided when using WO# 50654677 to calculate other CEA coil temperatures.

6.2 ($Rcoil_2$) = 13.62 ($Rcoil_1$) - .525 ohms (CEA #01 lead resistance).

6.3 ($Rcoil_2$) = 13.095 ohms

7.0 Obtain CEA #01 coil temperature as follows:

7.1 Use the following to obtain CEA #01 coil temperature:

- Coil resistance ($Rcoil_2$) calculated in step 6.0
- Table below

RESISTANCE	TEMP	RESISTANCE	TEMP	RESISTANCE	TEMP	RESISTANCE	TEMP
5.6	0.022	7.5	126.695	9.4	253.368	11.3	380.041
5.7	6.689	7.6	133.362	9.5	260.035	11.4	386.708
5.8	13.356	7.7	140.029	9.6	266.702	11.5	393.375
5.9	20.023	7.8	146.696	9.7	273.369	11.6	400.042
6	26.69	7.9	153.363	9.8	280.036	11.7	406.709
6.1	33.357	8	160.03	9.9	286.703	11.8	413.376
6.2	40.024	8.1	166.697	10	293.37	11.9	420.043
6.3	46.691	8.2	173.364	10.1	300.037	12	426.71
6.4	53.358	8.3	180.031	10.2	306.704	12.1	433.377
6.5	60.025	8.4	186.698	10.3	313.371	12.2	440.044
6.6	66.692	8.5	193.365	10.4	320.038	12.3	446.711
6.7	73.359	8.6	200.032	10.5	326.705	12.4	453.378
6.8	80.026	8.7	206.699	10.6	333.372	12.5	460.045
6.9	86.693	8.8	213.366	10.7	340.039	12.6	466.705
7	93.36	8.9	220.033	10.8	346.706	12.7	473.365
7.1	100.027	9	226.7	10.9	353.373	12.8	480.025
7.2	106.694	9.1	233.367	11	360.04	12.9	493.345
7.3	113.361	9.2	240.034	11.1	366.707	13	500.050
7.4	120.028	9.3	246.701	11.2	373.374	13.1	506.665

- All applicable steps are complete.
- Expected system response obtained.

2105.009 EXHIBIT 2 Revised 09/22/05

CEA #01 UPPER GRIPPER COIL TEMPERATURE MEASUREMENT

This exhibit provides Operations the ability to measure and trend CEA-01 upper gripper coil temperature. Other historically hot CEAs (2, 4, 8, 14, 15, 18, 55, 63, and 72) can also be measured by referring to WO# 50654677 CR-ANO-2-1999-0433-004.

1.0 Obtain currently calibrated Handheld Digital Voltmeter (DVM) or equivalent multimeter (Refer to 2OPG-012 for DVM usage).

NOTE

- Hold bus voltage prevents obtaining proper temperature readings.
- Record absolute values of voltage readings obtained.

2.0 Check CEA #01 NOT on Hold Bus.

3.0 Obtain CEA #01 Upper Gripper coil voltage (V_{ug}) as follows:

3.1 Locate CEA #1 power cables in panel on TBC4C6, (behind access panel to left of 2C72 door).

3.2 With DVM scale set on 200, take voltage reading across "Black" and "White" cables located on TBC4C6, terminals #4 and #5. (A typical reading is 44 VDC).

(V_{ug}) = 44 V

4.0 Obtain CEA #01 Upper Gripper shunt voltage (V_{shunt}) as follows:

4.1 Locate CEA #01 coil monitor connector on front side of 2C72. (This is a round, capped connector with (#1) located directly above it.

4.2 Remove connector cap by unscrewing.

4.3 With DVM scale set on 200mV, take voltage reading across pins "C" and "D". (A typical reading is 8 millivolts DC.)

4.3.1 Record DVM reading = 6.46 mV

Convert mV to Volts: 8.46 mV X $\frac{1\ V}{1000\ mV}$ = 0.00846 V

Record (V_{shunt}) = 0.00846 V

4.4 Screw connector cap back on CEA #01 coil monitor connector.

5.0 Utilize ohms law to calculate coil current (Icoil) as follows.

5.1 (Icoil) = (Vshunt) 0.00846 V ÷ .002 ohms.

5.2 (Icoil) = 4.23 amps

6.0 Calculate coil resistance ($Rcoil_1$) as follows:

6.1 ($Rcoil_1$) = (Vug) 44 V ÷ (Icoil) 4.23 amps

($Rcoil_1$) = 10.4 ohms

NOTE

Lead resistance must be subtracted to obtain accurate reading. Lead resistance for CEA #1 is provided in this calculation. However, a lookup table for lead resistance is provided when using WO# 50654677 to calculate other CEA coil temperatures.

6.2 ($Rcoil_2$) = 10.40 ($Rcoil_1$) - .525 ohms (CEA #01 lead resistance).

6.3 ($Rcoil_2$) = 10.40 ohms

7.0 Obtain CEA #01 coil temperature as follows:

7.1 Use the following to obtain CEA #01 coil temperature:

- Coil resistance ($Rcoil_2$) calculated in step 6.0
- Table below

RESISTANCE	TEMP	RESISTANCE	TEMP	RESISTANCE	TEMP	RESISTANCE	TEMP
5.6	0.022	7.5	126.695	9.4	253.368	11.3	380.041
5.7	6.689	7.6	133.362	9.5	260.035	11.4	386.708
5.8	13.356	7.7	140.029	9.6	266.702	11.5	393.375
5.9	20.023	7.8	146.696	9.7	273.369	11.6	400.042
6	26.69	7.9	153.363	9.8	280.036	11.7	406.709
6.1	33.357	8	160.03	9.9	286.703	11.8	413.376
6.2	40.024	8.1	166.697	10	293.37	11.9	420.043
6.3	46.691	8.2	173.364	10.1	300.037	12	426.71
6.4	53.358	8.3	180.031	10.2	306.704	12.1	433.377
6.5	60.025	8.4	186.698	10.3	313.371	12.2	440.044
6.6	66.692	8.5	193.365	10.4	320.038	12.3	446.711
6.7	73.359	8.6	200.032	10.5	326.705	12.4	453.378
6.8	80.026	8.7	206.699	10.6	333.372	12.5	460.045
6.9	86.693	8.8	213.366	10.7	340.039	12.6	466.705
7	93.36	8.9	220.033	10.8	346.706	12.7	473.365
7.1	100.027	9	226.7	10.9	353.373	12.8	480.025
7.2	106.694	9.1	233.367	11	360.04	12.9	493.345
7.3	113.361	9.2	240.034	11.1	366.707	13	500.050
7.4	120.028	9.3	246.701	11.2	373.374	13.1	506.665

- All applicable steps are complete.
- Expected system response obtained.

Administrative JOB PERFORMANCE MEASURE

Unit **2** REV #: **005** DATE: _____

SYSTEM/DUTY AREA: **Conduct of Operation A6**

TASK: **Review a system lineup to restore the Component Cooling Water system to normal operation following completion of maintenance.**

JTA#: **ANO-SRO-ADMIN-NORM-260**

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

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: _____ SIMULATOR: _____ CLASSROOM: Perform

POSITION EVALUATED: RO: _____ SRO: _____

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

TESTING METHOD: SIMULATE: _____ PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: **15 Minutes**

REFERENCE (S): **OP-1015.001,**
PID for Component Cooling Water System M-2234 sheet 1 & 2

EXAMINEE'S NAME: _____ Badge #: _____

EVALUATOR'S NAME: _____

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

SATISFACTORY: _____ UNSATISFACTORY: _____

PERFORMANCE CHECKLIST COMMENTS:

_____

_____

Start Time _____ Stop Time _____ Total Time _____

SIGNED: _____ DATE: _____

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

Administrative JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

Component Cooling Water loops are cross connected.

The CCW system danger tags have been removed following maintenance.

The shift manager has directed a partial valve lineup to be performed on the affected parts of the system.

TASK STANDARD: Examinee identified 5 of the 6 errors on the partial valve line up sheet:

- 2CV-5217 Loop I CCW Surge Tank Vent: Should be "Per 1015.001 Att. A.3" only; **NOT Locked Closed**
- 2CCW-1023 Surge Tank 2T-37B Drain: Should be **Open**
- 2CCW-89 Surge Tank 2T-37B Chem. Recirc: Should be **Open**
- 2CV-5210 Condensate Transfer to 2T-37A: Should be as "Per 1015.001 Att. A.3"; **NOT Open**
- 2CV-5218 Loop II CCW Surge Tank Vent: Should be "Per 1015.001 Att. A.3" only; **NOT Locked Closed**
- 2CCW-1022 Surge Tank 2T-37A Drain: Should be **Open**

AND

- Did not sign for partial line up approval.

TASK PERFORMANCE AIDS: OP-1015.001, OP-2104.028, and PID for Component Cooling Water System M-2234 sheet 1 & 2

Administrative JOB PERFORMANCE MEASURE

Initiating Cue:
The Component Cooling Water system is being restored to normal system lineup following completion of maintenance on the system.

The partial system lineup sheet has been submitted for approval.

Start Time: _____

NOTE: Provide a marked up copy of the system lineup to the examinee				
PERFORMANCE CHECKLIST			**PERFORMANCE STANDARDS**	**(Circle One)**
(C)	1.	Perform SRO review of the partial system lineup.	Examinee Identified 5 of the 6 errors. 2CV-5217 Loop I CCW Surge Tank Vent: Should be "Per 1015.001 Att. A.3" only; **NOT LOCKED CLOSED** 2CCW-1023 Surge Tank 2T-37B Drain: Should be **OPEN** 2CCW-89 Surge Tank 2T-37B Chem. Recirc: Should be **OPEN** 2CV-5210 Condensate Transfer to 2T-37A: Should be as "Per 1015.001 Att. A.3"; **NOT OPEN** 2CV-5218 Loop II CCW Surge Tank Vent: Should be "Per 1015.001 Att. A.3" only; **NOT LOCKED CLOSED** 2CCW-1022 Surge Tank 2T-37A Drain: Should be **OPEN**	SAT UNSAT SAT UNSAT SAT UNSAT SAT UNSAT SAT UNSAT SAT UNSAT
(C)	3.	Approve Partial Valve Lineup	Did not sign for SRO approval review of the partial valve line up.	SAT UNSAT
Examiner note: The candidates may put the position for the control valves but it is not required per 1015.001 Attachment A.3				
TERMINATING CUE: **This JPM is complete.**				

Stop Time: _____

Administrative JOB PERFORMANCE MEASURE

EXAMINER'S COPY

Initial Conditions:

Component Cooling Water loops are cross connected.

The CCW system danger tags have been removed following maintenance.

The shift manager has directed a partial valve lineup to be performed on the affected parts of the system.

Initiating Cue:

The Component Cooling Water system is being restored to normal system lineup following completion of maintenance on the system.

Review the partial system lineup sheet that has been submitted for approval.

Administrative JOB PERFORMANCE MEASURE

KEY

ARKANSAS NUCLEAR ONE		
E-DOC TITLE: **PARTIAL SYSTEM LINEUP SHEET**	**E-DOC NO.** **1015.001G**	**CHANGE NO.** **055-00-0**

System: Component Cooling Water Page 1 of 1

Reason for partial lineup, e.g. post maintenance test, clearance no., etc. Describe lineup if needed, e.g., list major components, boundaries, or list components excluded, etc.:

Restore system to normal line up following completion of piping repairs.

Partial lineup approval: _____ _____
SRO Signature Date:

Component	Description (optional)	Required Position	Checked Initial	SRO Initial*
2CCW-5214	2LT/LG-5214 Root Valve	OPEN		
2CV-5217	Loop I CCW Surge Tank Vent	Per 1015.001, Att. A.3		
2CCW-1023	Surge Tank 2T-37B Drain	OPEN		
2CCW-89	Surge Tank 2T-37B Chem. Recirc	OPEN		
2CCW-5031	Surge Tanks 2T-37A/B X-Connect Drain	CLOSED		
2CCW-5030	Surge Tanks 2T-37A/B Drain to LRW	CLOSED		
2CT-651	2FI-5210 Inlet Isol	OPEN		
2CT-650	2FI-5210 Outlet Isol	OPEN		
2CT-652	2FI-5210 Bypass	CLOSED		
2CT-653	2FI-5210 Drain	CLOSED		
2CT-16	Surge Tanks 2T-37A/B Makeup Isol	OPEN		
2CV-5210	Condensate Transfer to 2T-37A	Per 1015.001, Att. A.3		
2CV-5218	Loop II CCW Surge Tank Vent	Per 1015.001, Att. A.3		
2CCW-5082	Surge Tank 2T-37A Makeup Line Vent	CLOSED		
2CCW-5083	2LT/LG-5210 Root Valve	OPEN		
2CCW-5210	2LT/LG-5210 Root Valve	OPEN		
2CCW-1022	Surge Tank 2T-37A Drain	OPEN		
2CCW-88	Surge Tank 2T-37A Chem. Recirc	OPEN		
2CV-5214	Condensate Transfer Supply to 2T-37B	Per 1015.001, Att. A.3		
2CCW-5084	Surge Tank 2T-37B Makeup Line Vent	CLOSED		
2CCW-5085	2LT/LG-5214 Root Valve	OPEN		

*SRO Initial signifies review.

Lineup Performed By:

_____ / _____ / _____
Signature Initial Date

_____ / _____ / _____
Signature Initial Date

SRO Review: _____ Date _____

Administrative JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

Initial Conditions:

Component Cooling Water loops are cross connected.

The CCW system danger tags have been removed following maintenance.

The shift manager has directed a partial valve lineup to be performed on the affected parts of the system.

Initiating Cue:

The Component Cooling Water system is being restored to normal system lineup following completion of maintenance on the system.

Review the partial system lineup sheet that has been submitted for approval.

Administrative JOB PERFORMANCE MEASURE

ARKANSAS NUCLEAR ONE		
E-DOC TITLE: **PARTIAL SYSTEM LINEUP SHEET**	**E-DOC NO.** **1015.001G**	**CHANGE NO.** **055-00-0**

System: Component Cooling Water Page 1 of 1

Reason for partial lineup, e.g. post maintenance test, clearance no., etc. Describe lineup if needed, e.g., list major components, boundaries, or list components excluded, etc.:

Restore system to normal line up following completion of piping repairs.

Partial lineup approval: _____ _____
SRO Signature Date:

Component	Description (optional)	Required Position	Checked Initial	SRO Initial*
2CCW-5214	2LT/LG-5214 Root Valve	OPEN		
2CV-5217	Loop I CCW Surge Tank Vent	Per 1015.001, Att. A.3 LOCKED CLOSED		
2CCW-1023	Surge Tank 2T-37B Drain	CLOSED		
2CCW-89	Surge Tank 2T-37B Chem. Recirc	CLOSED		
2CCW-5031	Surge Tanks 2T-37A/B X-Connect Drain	CLOSED		
2CCW-5030	Surge Tanks 2T-37A/B Drain to LRW	CLOSED		
2CT-651	2FI-5210 Inlet Isol	OPEN		
2CT-650	2FI-5210 Outlet Isol	OPEN		
2CT-652	2FI-5210 Bypass	CLOSED		
2CT-653	2FI-5210 Drain	CLOSED		
2CT-16	Surge Tanks 2T-37A/B Makeup Isol	OPEN		
2CV-5210	Condensate Transfer to 2T-37A	OPEN		
2CV-5218	Loop II CCW Surge Tank Vent	Per 1015.001, Att. A.3 LOCKED CLOSED		
2CCW-5082	Surge Tank 2T-37A Makeup Line Vent	CLOSED		
2CCW-5083	2LT/LG-5210 Root Valve	OPEN		
2CCW-5210	2LT/LG-5210 Root Valve	OPEN		
2CCW-1022	Surge Tank 2T-37A Drain	CLOSED		
2CCW-88	Surge Tank 2T-37A Chem. Recirc	OPEN		
2CV-5214	Condensate Transfer Supply to 2T-37B	Per 1015.001, Att. A.3		
2CCW-5084	Surge Tank 2T-37B Makeup Line Vent	CLOSED		
2CCW-5085	2LT/LG-5214 Root Valve	OPEN		

*SRO Initial signifies review.

Lineup Performed By:

_____ / _____ / _____
Signature Initial Date

_____ / _____ / _____
Signature Initial Date

SRO Review: _____ Date _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 2 **DATE:** _____

SYSTEM/DUTY AREA: Equipment controls A7

TASK: Determine CREVS TS applicability and any required actions.

JTA#: ANO-SRO-ADMIN-NORM-103

KA VALUE RO: 3.6 **SRO:** 4.6 **KA REFERENCE:** 2.2.37

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: _____ **SIMULATOR:** Perform **CLASSROOM:** Perform

POSITION EVALUATED: RO: _____ **SRO:** _____

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

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): 2104.007, Control Room Emergency Ventilation, Unit 2 Tech Specs.

EXAMINEE'S NAME: _____ **Badge #:** _____

EVALUATOR'S NAME: _____

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

SATISFACTORY: _____ **UNSATISFACTORY:** _____

PERFORMANCE CHECKLIST COMMENTS:

_____

_____

Start Time _____ **Stop Time** _____ **Total Time** _____

SIGNED: _____ **DATE:** _____

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

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Unit 1 is in Mode 6 for a refueling outage and currently de-fueled.
- Unit 2 is in Mode 1.
- Unit 2 is loading a dry fuel cask.
- VSF-9 Unit 1 Emergency Filter/Fan is tagged out to align power from Unit 2 for a B55 bus outage. (Unit 2 T.S. 3.7.6.1 Action b and T.S. 3.7.6.1 Action g.)
- Chlorine Detector 2CLS-8761-1 is inoperable and bypassed due to sample pump failure.

TASK STANDARD:

Determined that T.S. 3.0.3 (T.S 3.7.6.1 Action e) and T.S. 3.7.6.1 Action j were applicable

AND

Determined the most restrictive required action was immediate suspension of handling of irradiated fuel.

TASK PERFORMANCE AIDS:

OP 2104.007, Control Room Emergency Ventilation, Unit 2 Tech Specs.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

- The CBOT discovers that 2VSF-9 feeder breaker is trip free.
- Also, I&C reports that 2CLS-8762-2 is inoperable because it will not actuate in response to chlorine.

Determine current applicable Unit 2 Tech Specs/TRM associated with Control Room ventilation.
AND
Identify the most restrictive required action.

START TIME: _____

	PERFORMANCE CHECKLIST	STANDARD	(Circle One)
	1. Review OP 2104.007, Control Room Emergency Air Conditioning and Ventilation Attachment B and C, and T.S. 3.7.6.1.	Examinee reviewed the Control Room Ventilation procedure and Tech Specs.	N/A SAT UNSAT
	2. Using Attachment C of 2104.007, determine that TRM entry is not required for the inoperable chlorine monitors.	Examinee determined that TRM entry is not required for chlorine monitors that are inoperable.	N/A SAT UNSAT
(C)	3. Using T.S. and 2104.007, determine current applicable Technical Specifications.	Examinee determined that T.S. 3.0.3 (T.S 3.7.6.1 Action e) and T.S. 3.7.6.1 Action j were applicable	N/A SAT UNSAT
Examiner Note: The candidate may indicate T.S. 3.7.6.1 action 'e' is applicable. T.S. 3.7.6.1 action 'e' states to apply the action of T.S. 3.0.3			
(C)	4. Determine most restrictive required action IAW TS.	Examinee determined the most restrictive required action was immediate suspension of handling of irradiated fuel.	N/A SAT UNSAT
END			

STOP TIME: _____

EXAMINER'S COPY

INITIAL CONDITIONS:

- Unit 1 is in Mode 6 for a refueling outage and currently de-fueled.
- Unit 2 is in Mode 1.
- Unit 2 is loading a dry fuel cask.
- VSF-9 Unit 1 Emergency Filter/Fan is tagged out to align power from Unit 2 for a B55 bus outage. (Unit 2 T.S. 3.7.6.1 Action b and T.S. 3.7.6.1 Action g.)
- Chlorine Detector 2CLS-8761-1 is inoperable and bypassed due to sample pump failure.

INITIATING CUE:

- The CBOT discovers that 2VSF-9 feeder breaker is trip free.
- Also, I&C reports that 2CLS-8762-2 is inoperable because it will not actuate in response to chlorine.

Determine current applicable Unit 2 Tech Specs/TRM associated with Control Room ventilation.

AND

Identify the most restrictive Required Action.

Current applicable Tech Specs:

- T.S. 3.0.3 (directed by 3.7.6.1 action e) and T.S. 3.7.6.1 action j.

Most restrictive Required Action:

- Action j:
  With both CREVS inoperable or with one more CREVS inoperable due to an inoperable CRE boundary, immediately suspend all activities involving the handling or irradiated fuel.

EXAMINEE'S COPY

INITIAL CONDITIONS:

- Unit 1 is in Mode 6 for a refueling outage and currently de-fueled.
- Unit 2 is in Mode 1.
- Unit 2 is loading a dry fuel cask.
- VSF-9 Unit 1 Emergency Filter/Fan is tagged out to align power from Unit 2 for a B55 bus outage. (Unit 2 T.S. 3.7.6.1 Action b and T.S. 3.7.6.1 Action g.)
- Chlorine Detector 2CLS-8761-1 is inoperable and bypassed due to sample pump failure.

INITIATING CUE:

- The CBOT discovers that 2VSF-9 feeder breaker is trip free.
- Also, I&C reports that 2CLS-8762-2 is inoperable because it will not actuate in response to chlorine.

Determine current applicable Unit 2 Tech Specs/TRM associated with Control Room ventilation.

AND

Identify the most restrictive Required Action.

Current applicable Tech Specs:

_____

_____

Most restrictive Required Action:

_____

_____

_____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 4 **DATE:** _____

SYSTEM/DUTY AREA: Radiation Controls A8

TASK: Approve administration of Potassium Iodide.

JTA#: ANO-SRO-EPLAN-EMERG-292

KA VALUE **RO:** 3.4 **SRO:** 3.8 **KA REFERENCE:** 2.3.14

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: _____ **SIMULATOR:** Perform **CLASSROOM:** Perform

POSITION EVALUATED: **RO:** _____ **SRO:** _____

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

TESTING METHOD: **SIMULATE:** _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 20 Minutes

REFERENCE(S): 1903.035, Administration of Potassium Iodide

EXAMINEE'S NAME: _____ **Badge #:** _____

EVALUATOR'S NAME: _____

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

SATISFACTORY: _____ **UNSATISFACTORY:** _____

PERFORMANCE CHECKLIST COMMENTS:

_____

_____

Start Time _____ **Stop Time** _____ **Total Time** _____

SIGNED: _____ **DATE:** _____

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

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- The plant is tripped from 100% power.
- 300 gpm LOCA in progress.
- Loss of Offsite power is in progress.
- LOCA EOP is being implemented.
- RDACS indicates an off site release in progress.
- Data indicates I-131 concentration of 8.0 E-05 μci/cc in area of work in Upper South Piping Penetration room.
- Whole body dose rates in area of work are 1Rem/hr.
- Site Area Emergency has been declared.
- RP estimates that it will take approximately 15 minutes to complete emergency actions and stop the release and all RP required controls/authorizations are complete.
- Joe Mechanic has read the precaution leaflet and has chosen to take Potassium Iodide if required.
- Air Purifying Respirator with Iodine Canister having a protection factor of 1.0 will be used in place of a SCBA due to piping interference.
- EOF, OSC and TSC have NOT been staffed.

TASK STANDARD:

Correctly completed Potassium Iodide (KI) Administration Form 1903.035A

AND

Approved the administration of KI to Joe Mechanic.

TASK PERFORMANCE AIDS: OP 1903.0035, Potassium Iodide Administration, Form 1903.035C (Completed), ANO Medical Questionnaire-Iodine Sensitivity and Form 1903.035A, Potassium Iodide Administration.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE: Determine if KI, Potassium Iodide, should be issued and complete necessary paperwork, using OP 1903.035.

START TIME: _____

Examiner Note: Provide the examinee a KI Administration Form 1903.035A and a Medical Questionnaire-Iodine Sensitivity Form 1903.035C that has been completed by Joe Mechanic			
	PERFORMANCE CHECKLIST	STANDARD	(Circle One)
	1. Review OP 1903.035, Administration of Potassium Iodide to determine criteria for administering KI. (Step 6.1.1 and Step 6.2.3.C.1)	Examinee determined the criteria for administration of KI is 10 REM exposure to thyroid committed dose equivalent or if concentration is unknown, the possibility exists for receiving large amounts of radioactive airborne iodine.	N/A SAT UNSAT
(C)	2. Using graph on 1903.035 Attachment 1 and information provided in initial conditions, determine that Joe Mechanic will exceed 10 REM during the maintenance evolution. (Step 6.2.3.B)	Determined that expected exposure will exceed 10 REM threshold.	N/A SAT UNSAT
	3. Complete form 1903.035A. (Step 6.3)	Completed all areas of form 1903.035A, Potassium Iodide Administration, from initial conditions: • Estimated Thyroid dose commitment. • Date. • Respiratory Protection Factor.	N/A SAT UNSAT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

Examiner Note: Provide the examinee a KI Administration Form 1903.035A and a Medical Questionnaire-Iodine Sensitivity Form 1903.035C that has been completed by Joe Mechanic			
	PERFORMANCE CHECKLIST	STANDARD	(Circle One)
(C)	4. Determine that Joe Mechanic is neither sensitive to nor has experienced an allergic reaction to Iodide.	Reviewed 1903.035C form and determined that Joe Mechanic was neither sensitive to nor has experienced an allergic reaction to Potassium Iodide in the past.	N/A SAT UNSAT
(C)	5. Determine that KI should be approved for distribution to Joe Mechanic during the Upper South Piping penetration work.	Examinee approved distribution of KI to Joe Mechanic by signing and dating form.	N/A SAT UNSAT
END			

STOP TIME: _____

EXAMINER'S COPY

INITIAL CONDITIONS:

- The plant is tripped from 100% power.
- 300 gpm LOCA in progress.
- Loss of Offsite power is in progress.
- LOCA EOP is being implemented.
- RDACS indicates an off site release in progress.
- Data indicates I-131 concentration of 8.0 E-05 μci/cc in area of work in Upper South Piping Penetration room.
- Whole body dose rates in area of work are 1Rem/hr.
- Site Area Emergency has been declared.
- RP estimates that it will take approximately 15 minutes to complete emergency actions and stop the release and all RP required controls/authorizations are complete.
- Joe Mechanic has read the precaution leaflet and has chosen to take Potassium Iodide if required.
- Air Purifying Respirator with Iodine Canister having a protection factor of 1.0 will be used in place of a SCBA due to piping interference.
- EOF, OSC and TSC have NOT been staffed.

INITIATING CUE:

Determine if KI, Potassium Iodide, should be issued and complete necessary paperwork, using OP 1903.035.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- The plant is tripped from 100% power.
- 300 gpm LOCA in progress.
- Loss of Offsite power is in progress.
- LOCA EOP is being implemented.
- RDACS indicates an off site release in progress.
- Data indicates I-131 concentration of 8.0 E-05 μci/cc in area of work in Upper South Piping Penetration room.
- Whole body dose rates in area of work are 1Rem/hr.
- Site Area Emergency has been declared.
- RP estimates that it will take approximately 15 minutes to complete emergency actions and stop the release and all RP required controls/authorizations are complete.
- Joe Mechanic has read the precaution leaflet and has chosen to take Potassium Iodide if required.
- Air Purifying Respirator with Iodine Canister having a protection factor of 1.0 will be used in place of a SCBA due to piping interference.
- EOF, OSC and TSC have NOT been staffed.

INITIATING CUE:

Determine if KI, Potassium Iodide, should be issued and complete necessary paperwork, using OP 1903.035.

Key

Potassium Iodide (KI) Administration Form

Name of Exposed Individual: Mechanic (Last) , Joe (First) , Robert (Middle)

Badge Number: 2572

Duration of Exposure: 15 Minutes

I-131 Concentration: 8.0×10^{-5} µCi/cc in air

Estimated Thyroid Dose Commitment:
- ☐ < 10 Rem
- ☒ ≥ 10 Rem
- ☐ Unknown, large exposure possible
- ☐ General Emergency Declared

Date of Exposure: Today

Respiratory Protection Worn During Exposure: ☒ Yes ☐ No

Respirator Protection Factor: 1.0

Known Iodide Allergy/Previous Allergic Reaction to iodide: ☐ Yes ☒ No

CAUTION

If the above box is checked yes, then **DO NOT** administer Potassium Iodide.

I verify that I have read and understand the precaution leaflet and I understand that taking thyroid blocking agent (KI) is strictly voluntary.

I ☒ choose ☐ do not choose to take KI.

Joe Mechanic
Signature of Exposed Individual

Today
Date

Approved: Signed by Applicant
Shift Manager/EOF Director/TSC Director

Today
Date

☐ Check if approval is via telecom.

KI Issued By: _____
Signature

_____
Date

Notes: _____

FORM TITLE:	CHANGE:.	REV.
POTASSIUM IODIDE ADMINISTRATION	1903.035A	011

Potassium Iodide (KI) Administration Form

Name of Exposed Individual: _____ , _____ , _____
Last First Middle

Badge Number: _____

Duration of Exposure: _____ I-131 Concentration: _____
Minutes μCi/cc in air

Estimated Thyroid Dose Commitment:
☐ < 10 Rem ☐ ≥ 10 Rem
☐ Unknown, large exposure possible
☐ General Emergency Declared

Date of Exposure: _____

Respiratory Protection Worn During Exposure: ☐ Yes ☐ No

Respirator Protection Factor: _____

Known Iodide Allergy/Previous Allergic Reaction to iodide: ☐ Yes ☐ No

CAUTION

If the above box is checked yes, then **DO NOT** administer Potassium Iodide.

I verify that I have read and understand the precaution leaflet and I understand that taking thyroid blocking agent (KI) is strictly voluntary.

I [X] choose ☐ do not choose to take KI.

Joe Mechanic _____ Today _____
Signature of Exposed Individual Date

Approved: _____ _____
Shift Manager/EOF Director/TSC Director Date
☐ Check if approval is via telecom.

KI Issued By: _____ _____
Signature Date

Notes: _____

_____

_____

_____

MEDICAL QUESTIONAIRE: IODINE SENSITIVITY

Name: Mechanic (LAST), Joe (FIRST), Robert (MIDDLE)

Badge Number: 2572 Company: Entergy Dept: Mech. Maintenance

Please answer the following questions. Mark the appropriate box.

NO.	QUESTION	YES	NO
1.	When eating seafood or shellfish, do you suffer from symptoms of stomach or bowel upset or skin eruption? If so, explain below.	☐	☒
2.	Has any physician told you that you have sensitivity to iodine?	☐	☒
3.	Have you ever had a gallbladder dye test, kidney x-ray requiring dye injection or a thyroid isotope scan?	☐	☒
	If so, any reactions?	☐	☐

Please explain any yes answers: _____

Signature: Joe Robert Mechanic Date: Today

FORM TITLE:	CHANGE:	REV.
ANO MEDICAL QUESTIONNAIRE-IODINE SENSITIVITY	1903.035C	011

JOB PERFORMANCE MEASURE

ANO-2-JPM-NRC-ADMIN-EAL11 **REV 02**

UNIT: 2 **REV #:** 2 **DATE:** _____

SYSTEM/DUTY AREA: Emergency Plan A9

TASK: Determine Emergency Action Level for given conditions.

JTA#: ANO-SRO-EPLAN-EMERG-278

KA VALUE RO: 2.9 **SRO:** 4.6 **KA REFERENCE:** 2.4.41

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: _____ **SIMULATOR:** Perform **CLASSROOM:** Perform

POSITION EVALUATED: RO: _____ **SRO:** _____

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

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes – EAL Classification

REFERENCE(S): 1903.010

EXAMINEE'S NAME: _____ **BADGE:** _____

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.

INITIAL CONDITIONS:

- Unit 2 has been operating at 100% for 230 consecutive days
- A plant trip has occurred due to a loss of offsite power with a concurrent Loss of Coolant Accident estimated to be 1500 gpm
- 4 hours following the trip, High Range containment radiation monitors read 74,450 R/hr and 77,730 R/hr respectively and trending up
- RCS average Core Exit Thermocouples are reading 430°F
- PZR pressure is 325 psia
- Containment Pressure is 20 psia and slowly trending down
- RDACs indicates NO offsite release in progress
- All safety systems are responding as designed

TASK STANDARD:

Determine EAL Classification GE, 1.5, Containment Radiation readings which indicate LOCA and >50% fuel overheat within 15 minutes.

TASK PERFORMANCE AIDS: 1903.010, Emergency Action Levels

INITIATING CUE:

Determine the highest EAL classification from the given initial conditions (list EAL classification event number).

START:_____

		PERFORMANCE CHECKLIST	STANDARD	(Circle One)
	1. (Step A of Att. 6)	Determine containment radiation readings are not modified due to power history Using OP 1903.010 Att. 6.	Using OP 1903.010 Attachment 6, verified power history does not require modifying containment radiation readings.	N/A SAT UNSAT
(C)	2. (EAL 1.5 1903.010)	Determine GE EAL classification Using OP 1903.010.	Using OP 1903.010, determined GE EAL Classification 1.5, Containment Radiation readings which indicate LOCA and >50% fuel overheat.	N/A SAT UNSAT
(C)	3. (Step 6.1 1903.010)	JPM complete in 15 minutes.	JPM complete in 15 minutes.	N/A SAT UNSAT
END				

STOP:_____

Examiner's Copy

INITIAL CONDITIONS:

- Unit 2 has been operating at 100% for 230 consecutive days
- A plant trip has occurred due to a loss of offsite power with a concurrent Loss of Coolant Accident estimated to be 1500 gpm
- 4 hours following the trip, High Range containment radiation monitors read 74,450 R/hr and 77,730 R/hr respectively and trending up
- RCS average Core Exit Thermocouples are reading 430°F
- PZR pressure is 325 psia
- Containment Pressure is 20 psia and slowly trending down
- RDACs indicates NO offsite release in progress
- All safety systems are responding as designed

INITIATING CUE:

Determine the highest EAL classification from the given initial conditions (list EAL classification event number).

ANSWER:

EAL classification and event number:	GE, EAL 1.5, Containment Radiation readings which indicate LOCA and >50% fuel overheat

Examinee's Copy

INITIAL CONDITIONS:

- Unit 2 has been operating at 100% for 230 consecutive days
- A plant trip has occurred due to a loss of offsite power with a concurrent Loss of Coolant Accident estimated to be 1500 gpm
- 4 hours following the trip, High Range containment radiation monitors read 74,450 R/hr and 77,730 R/hr respectively and trending up
- RCS average Core Exit Thermocouples are reading 430°F
- PZR pressure is 325 psia
- Containment Pressure is 20 psia and slowly trending down
- RDACs indicates NO offsite release in progress
- All safety systems are responding as designed

INITIATING CUE:

Determine the highest EAL classification from the given initial conditions (list EAL classification event number).

ANSWER:

EAL classification and event number: _____

Facility: Arkansas Nuclear One Unit 2 Date of Examination: 01/28/2011

Exam Level: RO X SRO-I ☐ SRO-U ☐ Operating Test No.: 2011-1

Control Room Systems[@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
S1. ANO-2-JPM-NRC-AOP3 010 A2.02 RO-3.9/SRO-3.9 Isolate failed PZR spray valve	A/N/S	3 Pressure Control
S2. ANO-2-JPM-NRC-SIT08 006 A1.13 RO-3.5/SRO-3.7 Lower SIT level	D/EN/S	2 Inventory Control
S3. ANO-2-JPM-NRC-EDG06 064 A4.06 RO-3.9/SRO-3.9 Align 2A-2 to 2A-4	D/S	6 Electrical
S4. ANO-2-JPM-NRC-CEA02 012 A4.06 RO-4.3/SRO-4.3 Test a Reactor Trip Circuit Breaker	D/S	7 Instrumentation
S5. ANO-2-JPM-NRC-CEA01 001 A4.03 RO-4.0/SRO-3.7 Perform a CEA exercise	D/S	1 Reactivity control
S6. ANO-2-JPM-NRC-CNMT2 103 A3.01 RO-3.9/SRO-4.2 Drain the containment sump	A/N/S	5 Containment Integrity
S7. ANO-2-JPM-NRC-RCP02 003 A4.08 RO-3.2/SRO-2.9 Restore CCW to RCPs	A/D/L/S	4 Heat Removal
S8. ANO-2-JPM-NRC-CCW02 008 A4.01 RO-3.3/SRO-3.1 Shift running CCW pumps	P/S	8 Plant service systems
In-Plant Systems[@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P1. ANO-2-JPM-NRC-AACLS 064 A4.01 RO-4.0/SRO-4.3 Start up AAC diesel generator manually locally during a LOOP	A/P/E/L	6 Electrical
P2. ANO-2-JPM-NRC-AUADV 041 A4.08 RO-3.0/SRO-3.1 Operate SDBCS valves locally	D/E/L	4 Heat Removal
P3. ANO-2-JPM-NRC-SFPAW 033 A2.03 RO-3.1/SRO-3.5 Fill SFP from RWT	D/R	8 Plant service systems

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

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 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: Arkansas Nuclear One Unit 2 Date of Examination: 01/28/2011

Exam Level: RO ☐ SRO-I X SRO-U ☐ Operating Test No.: 2011-1

Control Room Systems[@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
S1. ANO-2-JPM-NRC-AOP3 010 A2.02 RO-3.9/SRO-3.9 Isolate failed PZR spray valve	A/N/S	3 Pressure Control
S2. ANO-2-JPM-NRC-SIT08 006 A1.13 RO-3.5/SRO-3.7 Lower SIT level	D/EN/S	2 Inventory Control
S3. ANO-2-JPM-NRC-EDG06 064 A4.06 RO-3.9/SRO-3.9 Align 2A-2 to 2A-4	D/S	6 Electrical
S4. ANO-2-JPM-NRC-CEA02 012 A4.06 RO-4.3/SRO-4.3 Test a Reactor Trip Circuit Breaker	D/S	7 Instrumentation
S5. ANO-2-JPM-NRC-CEA01 001 A4.03 RO-4.0/SRO-3.7 Perform a CEA exercise	D/S	1 Reactivity control
S6. ANO-2-JPM-NRC-CNMT2 103 A3.01 RO-3.9/SRO-4.2 Drain the containment sump	A/N/S	5 Containment Integrity
S7. ANO-2-JPM-NRC-RCP02 003 A4.08 RO-3.2/SRO-2.9 Restore CCW to RCPs	A/D/L/S	4 Heat Removal
S8.		

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

P1. ANO-2-JPM-NRC-AACLS 064 A4.01 RO-4.0/SRO-4.3 Start up AAC diesel generator manually locally during a LOOP	A/P/E/L	6 Electrical
P2. ANO-2-JPM-NRC-AUADV 041 A4.08 RO-3.0/SRO-3.1 Operate SDBCS valves locally	D/E/L	4 Heat Removal
P3. ANO-2-JPM-NRC-SFPAW 033 A2.03 RO-3.1/SRO-3.5 Fill SFP from RWT	D/R	8 Plant service systems

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

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 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: Arkansas Nuclear One Unit 2 Date of Examination: 01/28/2011

Exam Level: RO ☐ SRO-I ☐ SRO-U X Operating Test No.: 2011-1

Control Room Systems[@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
S1. ANO-2-JPM-NRC-AOP3 010 A2.02 RO-3.9/SRO-3.9 Isolate failed PZR spray valve	A/N/S	3 Pressure Control
S2. ANO-2-JPM-NRC-SIT08 006 A1.13 RO-3.5/SRO-3.7 Lower SIT level	D/EN/S	2 Inventory Control

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

P1. ANO-2-JPM-NRC-AACLS 064 A4.01 RO-4.0/SRO-4.3 Start up AAC diesel generator manually locally during a LOOP	A/P/E/L	6 Electrical
P2. ANO-2-JPM-NRC-AUADV 041 A4.08 RO-3.0/SRO-3.1 Operate SDBCS valves locally	D/E/L	4 Heat Removal
P3. ANO-2-JPM-NRC-SFPAW 033 A2.03 RO-3.1/SRO-3.5 Fill SFP from RWT	D/R	8 Plant service systems

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

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 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	

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 2 **DATE:** _____

SYSTEM/DUTY AREA: Pressurizer Spray operation S1

TASK: Isolate failed open Pressurizer Spray valve. (Alternate Path)

JTA#: ANO2-RO-EOPAOP-OFFNORM-181

KA VALUE RO: 3.9 **SRO:** 3.9 **KA REFERENCE:** 010 A2.02

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 **CLASSROOM:** _____

POSITION EVALUATED: RO: _____ **SRO:** _____

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

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 6 Minutes

REFERENCE(S): OP-2203.028 PZR System Malfunctions

EXAMINEE'S NAME: _____ **Badge #:** _____

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

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

JPM INITIAL TASK CONDITIONS:

2CV-4651 PZR spray valve failed open. Mode 1

TASK STANDARD:

Reactor tripped and 2P-32A secured.

TASK PERFORMANCE AIDS:

OP 2203.028 Step 2

SIMULATOR SETUP:

All RCPs running. Mode 1
CV4651 value = 1.
Trigger1: CV4656 value = .9, DO_HS_4656_G = off, & DO_HS_4656_R = off
Conditional trigger 1 set gh4g4656.
Have all backup htrs on.

JOB PERFORMANCE MEASURE

INITIATING CUE:

Isolate PZR spray valve 2CV-4651 using 2203.028 PZR system malfunctions step 2

START TIME:_____

EXAMINER NOTE: Maintain the simulator in Freeze until the candidate is ready to start.

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1. (Step 2 A)	IF ANY PZR Spray valve failed open, THEN perform the following: A. Place affected PZR Spray valve in MANUAL and close: • 2CV-4651 • 2CV-4652	On panel 2C04 placed PZR spray valve 2HS-4651B in manual Placed 2CV-4651 handswitch in closed. Observed red and green lights flash above handswitch and the red light remains on.	N/A SAT UNSAT
	2. (Step 2.B.1)	IF affected PZR Spray valve did NOT close, THEN perform the following: Place associated PZR Spray valve handswitch to OPEN for 1 second: • 2CV-4651 • 2CV-4652 .	On panel 2C04, placed handswitch for 2CV-4651 in open for 1 sec. Observed red light ON above handswitch	N/A SAT UNSAT
	3. (Step 2.B.2)	WHEN 5 seconds have elapsed, THEN place handswitch in CLOSE until green indicating light flashes.	On panel 2C04 and 5 sec have elapsed, placed handswitch for 2CV-4651 in close until lights flash. Observed red and green lights flash above handswitch and the red light remains on.	N/A SAT UNSAT
	4. (Step 2.B.3)	IF affected PZR Spray valve will NOT close, THEN close associated energized Block valves: • 2CV-4655 • 2CV-4656	On panel 2C04, placed 2CV-4655/2CV-4656 handswitch to close. Observed 2CV-4656 lights out and PZR pressure lowering.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

	PERFORMANCE CHECKLIST		STANDARDS	(Circle One)
EXAMINER'S NOTE: **The following is the alternate path portion of this JPM**				
	5. (Step 2.B.4.a)	IF associated energized PZR Spray Block valves will NOT close, THEN perform the following: a) Verify ALL PZR heaters ON.	On panel 2C04, observed all PZR heater on as indicated by red lights above the handswitches.	N/A SAT UNSAT
(C)	6. (Step 2.B.4.b.1)	IF RCS pressure lowers to 2000 psia, THEN perform the following: IF plant in mode 1 or 2, THEN trip Reactor. **EXAMINER CUE:** **If desired to speed up JPM then inform examinee that RCS pressure is 2000 psia.**	When, RCS pressure is observed at 2000 psia or informed by evaluator RCS is 2000 psia, tripped the reactor.	N/A SAT UNSAT
(C)	7. (Step 2.B.4.b.2)	Stop RCP in loop with failed PZR Spray valve.	Secured 2P-32A Reactor Coolant pump.	N/A SAT UNSAT
Examiner's Note: Examinee may secure an additional RCP to balance flow in the RCS loops.				
END				

STOP TIME:_____

JOB PERFORMANCE MEASURE

Examiner's Copy

INITIAL CONDITIONS:

Mode 1

2CV-4651 PZR spray valve has failed open during boron equalization.

INITIATING CUE:

Isolate PZR spray valve 2CV-4651 using 2203.028 PZR system malfunctions starting with step 2.

JOB PERFORMANCE MEASURE

Examinee's Copy

INITIAL CONDITIONS:

Mode 1

2CV-4651 PZR spray valve has failed open during boron equalization.

INITIATING CUE:

Isolate PZR spray valve 2CV-4651 using 2203.028 PZR system malfunctions starting with step 2.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **PZR SYSTEM MALFUNCTION**	DOCUMENT NO. **2203.028**	CHANGE NO. **010**
	WORK PLAN EXP. DATE **N/A**	
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☐YES ☒NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these *TRAPS*	**Get these *TOOLS***
Time Pressure	**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**	**054**

2. IF ANY PZR Spray valve failed open, THEN perform the following:

A. Place affected PZR Spray valve in MANUAL and close:

- 2CV-4651
- 2CV-4652

(Step 2 continued on next page)

2. (continued)

B. IF affected PZR Spray valve did NOT close, THEN perform the following:

1) Place associated PZR Spray valve handswitch to OPEN for 1 second:

- 2CV-4651
- 2CV-4652

2) WHEN 5 seconds have elapsed, THEN place handswitch in CLOSE until green indicating light flashes.

3) IF affected PZR Spray valve will NOT close, THEN close associated energized Block valves:

- 2CV-4655
- 2CV-4656
- 2CV-4653
- 2CV-4654

4) IF associated energized PZR Spray Block valves will NOT close, THEN perform the following:

a) Verify ALL PZR heaters ON.

b) IF RCS pressure lowers to 2000 psia, THEN perform the following:

1. IF plant in mode 1 or 2, THEN trip Reactor.

2. Stop RCP in loop with failed PZR Spray valve.

3. **GO TO** 2202.001, Standard Post Trip Actions.

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 11 **DATE:** _____

SYSTEM/DUTY AREA: Safety Injection System S2

TASK: Lower Safety Injection Tank level (2T2A)

JTA#: ANO2-RO-ECCS-NORM-5

KA VALUE RO: 3.5 **SRO:** 3.7 **KA REFERENCE:** 006 A1.13

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 **CLASSRROOM:** _____

POSITION EVALUATED: RO: _____ **SRO:** _____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ **PLANT SITE:** ____ **CLASSROOM:** ____

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 8 Minutes

REFERENCE(S): OP 2104.001

EXAMINEE'S NAME: _____ **Badge#:** _____

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

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

INITIAL CONDITIONS: 'A' SIT needs to be lowered 0.1%.

TASK STANDARD: SIT (2T2A) level has been lowered at least 0.1%.

TASK PERFORMANCE AIDS: OP 2104.001 Section 7.1

SIMULATOR SETUP: 2T2A level is ~85.2% and pressure is 616 psig.

Use the following as necessary to adjust SIT level/pressure on the monitor screen simn2(1) ~775 and SIM301(1) ~ 97700

JOB PERFORMANCE MEASURE

INITIATING CUE:

Lower SIT (2T2A) level, to RDT, 0.1% using OP 2104.001; Section 7.1 beginning with Step 7.1.2. OPS B-37 does not need to be completed.

START TIME:_____

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	1. (Step 7.1.4)	Open SIT Drain to RDT. (2CV-5081)	On panel 2C33, placed handswitch for SIT Drain to RDT (2CV-5081) to OPEN. Observed red light ON green light OFF above handswitch.	N/A SAT UNSAT
	2. (Step 7.1.5)	Close SIT Drain to RDT. 2CV-5081)	On panel 2C33, placed handswitch for SIT Drain to RDT (2CV-5081) to CLOSED. Observed green light ON red light OFF above handswitch.	N/A SAT UNSAT
	3. (Step 7.1.6)	Check for RCS back leakage through Check Valve 2SI-15A. **Examiner note: 2PIS-5000 will be less than 650 psig and the rest of step 7.1.6 will be N/A**	On panel 2C17 checked 2PIS-5000 < 650 psig.	N/A SAT UNSAT
(C)	4. Step 7.1.7)	Open SIT (2T2A) Drain Valve. (2SV-5001-1)	On panel 2C17, placed handswitch for SIT A Drain Valve (2SV-5001-1) to OPEN. Observed red light ON green light OFF above handswitch.	N/A SAT UNSAT
Procedure Note: If SIT drain header pressurized, then SIT Drain valves may be slow to close due to no DP. (CR-ANO-2-2004-0802)				

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	5. Step 7.1.8)	Verify SIT (2T2A) desired level is achieved.	Verified SIT (2T2A) level between 84.8% and 85.1%. Observed SIT (2T2A) control board level instrument(s): - 2LIS-5008 (2C17) - 2LI-5010 (2C17) - 2LIS-5009 (2C16) OR Observed SIT (2T2A) level on PMS, or SPDS computer point/trend display.	N/A SAT UNSAT
(C)	6. Step 7.1.8)	Close SIT (2T2A) Drain Valve. (2SV-5001-1)	On panel 2C17, placed handswitch for SIT A Drain Valve (2SV-5001-1) to CLOSE. Observed green light ON above handswitch.	N/A SAT UNSAT
END				

STOP TIME:_____

JOB PERFORMANCE MEASURE

Examiner's Copy

INITIAL CONDITIONS:

SIT (2T2A) level needs to be lowered.

INITIATING CUE:

Lower SIT (2T2A) level, to RDT, 0.1% using OP 2104.001; Section 7.1 beginning with Step 7.1.2. OPS B-37 does not need to be completed.

JOB PERFORMANCE MEASURE

Examinee's Copy

INITIAL CONDITIONS:

SIT (2T2A) level needs to be lowered.

INITIATING CUE:

Lower SIT (2T2A) level, to RDT, 0.1% using OP 2104.001; Section 7.1 beginning with Step 7.1.2. OPS B-37 does not need to be completed.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **SAFETY INJECTION TANK OPERATIONS**	DOCUMENT NO. **2104.001**	CHANGE NO. **036**
	WORK PLAN EXP. DATE **N/A**	
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☐YES ☒NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**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
[signature] 1550	today	0600

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

7.0 LOWERING SAFETY INJECTION TANK LEVEL

7.1 Draining SITs to RDT in Mode 1, 2, 3, or 4 with SIT Outlet valves Open

7.1.1 IF source of SIT inleakage unknown,
THEN initiate SIT Level Change (OPS-B37) as desired.

7.1.2 IF OPS-B37 being maintained for SIT to be drained,
THEN record pre-drain level on OPS-B37.

* 7.1.3 Monitor all SIT levels and pressures during this operation.

7.1.4 Open SIT Drain to RDT (2CV-5081).

7.1.5 IF desired level drop is < 1/2%,
THEN close 2CV-5081.

* 7.1.6 IF SIT Injection header to be drained is > 650 psig,
THEN open selected SIT drain valve per listed restrictions:

A. Cycle selected valve open for a maximum of 10 seconds.

B. Wait at least 6 minutes between valve cycles.

C. IF additional drain needed,
THEN cycle selected valve open for a maximum of 10 seconds.

D. Allow at least 2 hours before repeating this sequence.

- SIS Injection to Loop 2P-32A (2PIS-5000)
- SIS Injection to Loop 2P-32B (2PIS-5020)
- SIS Injection to Loop 2P-32C (2PIS-5040)
- SIS Injection to Loop 2P-32D (2PIS-5060)

7.1.7 Open desired SIT Drain valve:

- 2T-2A - SIT A Drain valve (2SV-5001-1)
- 2T-2B - SIT B Drain valve (2SV-5021-1)
- 2T-2C - SIT C Drain valve (2SV-5041-2)
- 2T-2D - SIT D Drain valve (2SV-5061-2)

NOTE

If SIT drain header pressurized, then SIT Drain valves may be slow to close due to no DP. (CR-ANO-2-2004-0802)

7.1.8 WHEN desired SIT level or pressure reached,
THEN close SIT Drain valve opened:

- 2SV-5001-1
- 2SV-5021-1
- 2SV-5041-2
- 2SV-5061-2

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 3 **DATE:**_____

SYSTEM/DUTY AREA: Emergency Diesel Generator System S3

TASK: Align 2A2 to 2A4

JTA#: ANO2-RO-EDG-NORM-22

KA VALUE RO: 3.9 **SRO:** 3.9 **KA REFERENCE:** 064 A4.06

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 **CLASSROOM:** _____

POSITION EVALUATED: RO: _____ **SRO:** _____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ **PLANT SITE:** _____ **CLASSROOM:** _

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 10 Minutes

REFERENCE(S): OP 2104.036

EXAMINEE'S NAME: _____ **BADGE#:** _____

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

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

INITIAL CONDITIONS: 2DG2 has been supplying 2A4 for 4 hours to allow maintenance on 2A409. Maintenance and PMT are complete on 2A409.

TASK STANDARD: 2A409 closed.

TASK PERFORMANCE AIDS: OP 2104.036 Section 14.0. Sync switch.

SIMULATOR SETUP: 2DG2 supplying 2A4. 2A4 isolated from 2A2 with 2A409 open.

JOB PERFORMANCE MEASURE

INITIATING CUE:

Supply 2A4 from offsite power using OP 2104.036 section 14.0.

START TIME:_____

	PERFORMANCE CHECKLIST		STANDARDS	(Circle One)
Procedure Note: If 2DG2 is run unloaded for greater than ten minutes OR multiple starts performed, the engine should be operated at full load for one hour prior to securing.				
	1. (Step 14.1)	Verify SIAS signal cleared.	On panel 2C03, operator insert panels, observed that SIAS matrix trip lamps are lit and/or SIAS annunciators are clear on 2K04 and 2K05 and/or on 2C23 verify that SIAS trip lamps are clear and the matrix trip lights are lit.	N/A SAT UNSAT
	2. (Step 14.2.1)	Verify 2A2 available to supply 2A4.	On panel 2C10, verified that 2A2 is energized by observing either: The handswitch from Unit Aux to 2A2 has red light **ON** and Green light **OFF.** Observed voltage on 2A2.	N/A SAT UNSAT
Procedure Note: Neutral Overvolt (2K131-3) alarm clears when Engine/Gen Trouble (2K09-J1) is cleared.				
	3. (Step 14.2.2)	Verify Neutral Overvolt alarm 2K131-3 clear. **EXAMINER CUE:** **If asked NLO reports Neutral Overvolt alarm on 2K131-3 clear.**	On 2C33, observed annunciator 2K09 Window J1 alarm, Engine/Gen trouble is clear by observing that the annunciator window is not lit. or Contact AO and check locally.	N/A SAT UNSAT
(C)	4. (Step 14.2.3)	Place 2A409 synchronize switch to "ON".	On panel 2C33, inserted synchronize switch handle into 2A409, 2A4 supply breaker synchronize switch. Rotated handle clockwise to "ON".	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	5. (Step 14.2.4)	Adjust Generator voltage (Incoming) using Voltage Regulator switch (CS 3) as per BOTH of the following: Generator voltage (Incoming) ~ 100 volts higher than System voltage (Running) by 2C-33 indication. Generator voltage (Incoming) higher than System voltage (Running) by SPDS indication (NA if SPDS indication not available).	On 2C33, compare incoming and Running voltages. Verified incoming is ~100 volts higher than running on 2C-33. Verified incoming voltage is higher than running voltage by SPDS indication. Adjust EDG voltage using Voltage regulator switch to match voltages. (If required.)	N/A SAT UNSAT
(C)	6. (Step 14.2.5)	Adjust frequency to cause synchroscope to rotate slowly in FAST direction using Governor Control switch (CS 4).	On panel 2C33, adjusted frequency to cause synchroscope to rotate slowly in the FAST direction using Governor Control Handswitch (CS4) to raise or lower 2DG2 speed. (If required.)	N/A SAT UNSAT
Procedure Caution: 2DG2 load will lower when 2A-409 is closed because the governor control circuit shifts to DROOP.				
(C)	7. (Step 14.2.6)	Perform the following to close 2A-409: A. WHEN synchroscope approaches the 12 o'clock position, THEN close 2A-409 (152-409/CS). B. Immediately raise 2DG2 load to ~1400 KW to prevent a reverse power trip using Governor Control switch (CS 4).	On panel 2C33, placed hand on 2A409, 2A4 supply breaker (152-409). Observed 2DG2 synchroscope rotation. Rotated 152-409 handswitch to "CLOSE" when synchroscope passed through 12 o'clock position. Verified red light for 2A409, 2A4 supply breaker ON. Raised load by placing Governor Control switch to raise until load is ~1400 KW.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	8. (Step 14.2.7)	Adjust Generator KVARs between 600 KVARs IN and 1800 KVARs OUT using Voltage Regulator switch (CS 3). (Preferred range is 0 to 100 OUT)	On panel 2C33, observed 2DG2 Kilovar meter. Adjusted Voltage Regulator Handswitch as required to maintain 2DG2 Kilovars between 0 and 100 Kilovars OUT.	N/A SAT UNSAT
	9. (Step 14.2.8)	Place 2A409, 2A4 supply breaker Synchroscope switch to "OFF".	On panel 2C33, rotated 2A409, 2A4 supply breaker Synchroscope Switch to "OFF".	N/A SAT UNSAT
EXAMINER NOTE: **This JPM may be stopped once 2A-409 synchroscope switch in OFF.**				
END				

START TIME:_____

JOB PERFORMANCE MEASURE

Examiner's Copy

INITIAL CONDITIONS:

- 2DG2 has been supplying 2A4 for 4 hours to allow maintenance on 2A409.
- Maintenance and PMT are complete on 2A409.

INITIATING CUE:

Supply 2A4 from offsite power using OP 2104.036 section 14.0.

JOB PERFORMANCE MEASURE

Examinee's Copy

INITIAL CONDITIONS:

- 2DG2 has been supplying 2A4 for 4 hours to allow maintenance on 2A409.
- Maintenance and PMT are complete on 2A409.

INITIATING CUE:

Supply 2A4 from offsite power using OP 2104.036 section 14.0.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **EMERGENCY DIESEL GENERATOR OPERATIONS**	DOCUMENT NO. **2104.036**	CHANGE NO. **075**
	WORK PLAN EXP. DATE **N/A**	
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☐YES ☒NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**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**	**054**

14.0 MANUAL SHUTDOWN OF 2DG2

NOTE
If 2DG2 is run unloaded for greater than ten minutes OR multiple starts performed, the engine should be operated at full load for one hour prior to securing.

14.1 IF SIAS is actuated,
THEN reset SIAS per Attachment 13 of 2202.010, Standard Attachments.

14.2 IF 2A4 Supply breaker (2A-409) open,
AND necessary to supply 2A4 from offsite power,
THEN perform the following:

14.2.1 Verify 2A2 available to supply 2A4.

NOTE
Neutral Overvolt (2K131-3) alarm clears when Engine/Gen Trouble (2K09-J1) is cleared.

14.2.2 Verify Neutral Overvolt (2K131-3) alarm clear.

14.2.3 Place 2A-409 Synchronize switch to ON.

14.2.4 Adjust Generator voltage (Incoming) using Voltage Regulator switch (CS 3) as per BOTH of the following:

- Generator voltage (Incoming) ~ 100 volts higher than System voltage (Running) by 2C-33 indication.
- Generator voltage (Incoming) higher than System voltage (Running) by SPDS indication (NA if SPDS indication not available).

14.2.5 Adjust frequency to cause synchroscope to rotate slowly in FAST direction using Governor Control switch (CS 4).

CAUTION
2DG2 load will lower when 2A-409 is closed because the governor control circuit shifts to DROOP.

14.2.6 Perform the following to close 2A-409:

A. WHEN synchroscope approaches the 12 o'clock position,
THEN close 2A-409 (152-409/CS).

B. Immediately raise 2DG2 load to ~1400 KW to prevent a reverse power trip using Governor Control switch (CS 4).

14.2.7 Adjust Generator KVARs between 600 KVARs IN and 1800 KVARs OUT using Voltage Regulator switch. (Preferred range is 0 to 100 OUT)

14.2.8 Place 2A-409 Synchronize switch in OFF.

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 11 **DATE:** _____

SYSTEM/DUTY AREA: Control Element Drive Mechanism Control System S4

TASK: Test a Reactor Trip Circuit Breaker.

JTA#: ANO2-RO-CEDM-SURV-15

KA VALUE RO: 4.3 **SRO:** 4.3 **KA REFERENCE:** 012 A4.06

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: Simulate **SIMULATOR:** Perform **CLASSROOM:** _____

POSITION EVALUATED: RO: _____ **SRO:** _____

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

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 minutes

REFERENCE(S): OP 2105.009 SUPP. 1

EXAMINEE'S NAME: _____ **BADGE:** _____

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

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

INITIAL CONDITIONS: TCB-02 has been repaired following a component malfunction. The plant is in Mode 1. Supplement 1 Section 1.0 of 2105.009 is completed. An operator is standing by in the CEDM room.

TASK STANDARD: Reactor trip circuit breaker TCB-2 and TCB-6 operated in accordance with OP 2105.009 Supplement 1.

TASK PERFORMANCE AIDS: OP 2105.009 Supplement 1.0 section 2.1 and 2.2. TCB Close Key.

SIMULATOR SETUP: TCB 9 closed. TCB 2 is open. Mode 1

JOB PERFORMANCE MEASURE

INITIATING CUE:

Perform the Reactor Trip Circuit Breaker Test for TCB-2 only, using OP 2105.009 Supplement 1.0 section 2.1 and 2.2. Leave TCB-2 closed.

Start Time: _____

	PERFORMANCE CHECKLIST		STANDARDS	(Circle One)
Procedure Caution: If TCB Undervoltage Trip Device Armature NOT in contact with Air Gap Adjustment Screw, then breaker may not open when required				
	1. (Step 2.1.1)	Verify undervoltage (UV) trip device position for Reactor Trip Circuit Breakers TCB-2. **EXAMINER CUE:** **CEDM Room operator reports UV Trip Device armatures for TCB-2 is in contact with air gap adjusting screw.**	Contacted operator in CEDM room. Requested verification of position of UV trip device armatures for TCB-2.	N/A SAT UNSAT
	2. (Step 2.1.2)	Obtain CPC Test/TCB close key (#15) from SM key locker.	CPC Test/TCB close key (#15) obtained from SM key locker.	N/A SAT UNSAT
	3. (Step 2.1.3)	On 2C23, place applicable Reset Actuation Trip Path keylock in UNLK.	On 2C23, placed applicable Reset Actuation Trip Path keylock in UNLK.	N/A SAT UNSAT
(C)	4. (Step 2.1.4)	Close TCB-2 using pushbutton on 2C23.	Depress TCB-2 reset push button. On panel 2C23 or panel 2C14, verified red light ON for TCB-2. Placed key in LOCK position and removed key.	N/A SAT UNSAT
(C)	5. (Step 2.1.5)	On 2C23, place applicable Reset Actuation Trip Path keylock in LK.	Placed key in LOCK position and removed key.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

	PERFORMANCE CHECKLIST		STANDARDS	(Circle One)
Perform the following to test Shunt Trip:				
	6. (Step 2.2)	Verify TCB-2 closed per step 2.1	On panel 2C23 or panel 2C14, verified red light ON for TCB-2.	N/A SAT UNSAT
	7. (Step 2.2)	Hold 2HS/TEST switch in UV Bypass position (for TCB-2). **EXAMINER CUE:** **CEDM Room operator reports 2HS/TEST switch is in the UV Bypass Position.**	Contacted operator in CEDM room. Requested 2HX/TEST switch be held in the UV Bypass position.	N/A SAT UNSAT
(C)	8. (Step 2.2)	Depress Manual Reactor Trip push button (2HS-9071-2).	On panel 2C03, depressed push button 2HS-9071-2.	N/A SAT UNSAT
	9. (Step 2.2)	Verify TCB-2 open.	On panel 2C14, verified TCB-2 opens.	N/A SAT UNSAT
	10. (Step 2.2)	Check 2K12-A10 alarm comes in or reflashes.	On annunciator panel 2K12, acknowledged that 2K12-A10 actuated.	N/A SAT UNSAT
	11. (Step 2.2)	Contact CEDM Room operator to release 2HS/TEST switch. **EXAMINER CUE:** **CEDM Room operator reports that 2HS/TEST switch is released**	Contact CEDM Room operator to release 2HS/TEST switch.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

	PERFORMANCE CHECKLIST		STANDARDS	(Circle One)
EVALUATORS NOTE: The simulator does not model 2K426. When the examinee attempts to open the door to 2C14, give them the cue on the next step.				
	12. (Step 2.2)	Verify reflash Unit 2K426 in 2C14 reset. **EXAMINER CUE: 2K426 reflash unit is reset.**	Preceded to the back of 2C-14 to reset 2K426 reflash unit.	N/A SAT UNSAT
	13. (Step 2.1.1)	Verify undervoltage (UV) trip device position for Reactor Trip Circuit Breakers TCB-2. **EXAMINER CUE:** **CEDM Room operator reports UV Trip Device armatures for TCB-2 is in contact with air gap adjusting screw.**	Contacted operator in CEDM room. Requested verification of position of UV trip device armatures for TCB-2.	N/A SAT UNSAT
(C)	14. (Step 2.1)	Close TCB-2.	On panel 2C23, inserted key in ESF reset push button keylock. Placed key in UNLOCK position. Depress TCB-2 reset push button. On panel 2C23 or panel 2C14, verified red light ON for TCB-2. Placed key in LOCK position and removed key.	N/A SAT UNSAT
Perform the following to test UV Trip:				
	15. (Step 2.2)	Verify TCB-2 closed per step 2.1	On panel 2C23 or panel 2C14, verified red light ON for TCB-2.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	16. (Step 2.2)	Hold 2HS/TEST switch in Shunt Bypass position (for TCB-2). **EXAMINER CUE:** **CEDM Room operator reports 2HS/TEST switch is in the Shunt Bypass Position.**	Contacted operator in CEDM room. Requested 2HX/TEST switch be held in the Shunt Bypass position.	N/A SAT UNSAT
(C)	17. (Step 2.2)	Depress Manual Reactor Trip push button (2HS-9071-2).	On panel 2C03, depressed push button 2HS-9071-2.	N/A SAT UNSAT
	18. (Step 2.2)	Verify TCB-2 opens.	On panel 2C14, verified TCB-2 opens. Verified by green lights ON for TCB-2.	N/A SAT UNSAT
	19. (Step 2.2)	Check 2K12-A10 alarm comes in or reflashes.	On annunciator panel 2K12, acknowledged that 2K12-A10 actuated.	N/A SAT UNSAT
	20. (Step 2.2)	Contact CEDM Room operator to release 2HS/TEST switch. **EXAMINER CUE:** **CEDM Room operator reports that 2HS/TEST switch is released**	Contact CEDM Room operator to release 2HS/TEST switch.	N/A SAT UNSAT
EVALUATORS NOTE: The simulator does not model 2K426. When the examinee attempts to open the door to 2C14, give them the cue below.				
	21. (Step 2.2)	Reset Reflash unit 2K426 in 2C14. **EXAMINER CUE: 2K426 reflash unit is reset.**	Preceded to the back of 2C-14 to reset 2K426 reflash unit.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	22. (Step 2.2)	Verify undervoltage (UV) trip device position for Reactor Trip Circuit Breakers TCB-2 and TCB-6. **Examiner Cue**: **CEDM Room operator reports UV Trip Device armatures for TCB-2 and TCB-6 are in contact with air gap adjusting screws.**	Contacted operator in CEDM room. Requested verification of position of UV trip device armatures for TCB-2 and TCB-6.	N/A SAT UNSAT
(C)	23. (Step 2.2.1)	Close TCB-2 and TCB-6.	On panel 2C23, inserted key in ESF reset push button keylock. Placed key in UNLOCK position. Depress TCB-2 and TCB-6 reset push button. On panel 2C23 or panel 2C14, verified red light ON for TCB-2 and TCB-6. Placed key in LOCK position and removed key.	N/A SAT UNSAT
END				

Stop Time: _____

JOB PERFORMANCE MEASURE

Examiner's Copy

INITIAL CONDITIONS

- TCB-02 has been repaired following a component malfunction.
- The plant is in Mode 1.
- Supplement 1 Section 1.0 of 2105.009 CEDM control system operations is completed.
- An operator is standing by in the CEDM room.

INITIATING CUE:

Perform the Reactor Trip Circuit Breaker Test for TCB-2 only, using OP 2105.009 Supplement 1 section 2.1 and 2.2. Leave TCB-2 and TCB-6 closed.

JOB PERFORMANCE MEASURE

Examinee's Copy

INITIAL CONDITIONS

- TCB-02 has been repaired following a component malfunction.
- The plant is in Mode 1.
- Supplement 1 Section 1.0 of 2105.009 CEDM control system operations is completed.
- An operator is standing by in the CEDM room.

INITIATING CUE:

Perform the Reactor Trip Circuit Breaker Test for TCB-2 only, using OP 2105.009 Supplement 1 section 2.1 and 2.2. Leave TCB-2 and TCB-6 closed.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **CEDM CONTROL SYSTEM OPERATION**	DOCUMENT NO. **2105.009**	CHANGE NO. **028**
	WORK PLAN EXP. DATE **N/A**	
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☐YES ☒NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**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
[signature] 1550	today	0600

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

SUPPLEMENT 1

REACTOR TRIP CIRCUIT BREAKER TEST

This test completed prior to each Reactor Startup unless performed in previous seven days per Tech Spec Table 4.3-1 (Item 1).

1.0 INITIAL CONDITIONS

All Reactor Trip signals clear. —

IF in Mode 3, 4 or 5
AND CEAs are capable of being withdrawn,
THEN verify requirements of TCB/CEDMCS Status log (OPS-B26) satisfied to ensure compliance with TS 3.3.1.1 AND 3.1.3.3. N/A

IF in Mode 3, 4 or 5
AND CEAs are capable of being withdrawn,
THEN enter TS 3.3.1.1 Table 3.3-1 action 8. N/A

IF desired to close TCB-9 locally,
THEN close using pushbutton. N/A

2.0 TEST METHOD

CAUTION
If TCB Undervoltage Trip Device Armature NOT in contact with Air Gap Adjustment Screw, then breaker may not open when required.

* 2.1 WHEN closing TCBs 1 through 8 in this supplement,
THEN perform the following for selected TCBs:

2.1.1 Verify Undervoltage Trip Device Armature in contact with Air Gap Adjustment Screw using Exhibit 1, Plant Heatup (2102.002).

2.1.2 Obtain CPC Test/TCB close key (#15) from SM key locker.

2.1.3 On 2C23, place applicable Reset Actuation Trip Path keylock in UNLK.

R A P

2.1.4 Close selected TCBs using pushbuttons on 2C23.

2.1.5 On 2C23, place applicable Reset Actuation Trip Patch keylock in LK.

SUPPLEMENT 1

2.2 Test TCB-2 AND TCB-6 as follows: (Complete all steps in order written for each TCB before proceeding to next TCB.)

INSTRUCTION STEP	TCB-2 2HS/TEST	TCB-6 6HS/TEST
Perform the following to test Shunt Trip:	N/A	N/A
Verify TCB closed per step 2.1		
Hold XHS/TEST in UV Bypass position. (X is TCB #)		
Momentarily depress Reactor Trip pushbutton (2HS-9071-2) on 2C03.		
Verify TCB opens.		
Check 2K12-A10 alarm comes in or reflashes.		
Release XHS/TEST. (X is TCB #)		
Verify Reflash Unit 2K426 in 2C14 reset.		
Perform the following to test UV Trip:	N/A	N/A
Verify TCB closed per step 2.1		
Hold XHS/TEST in Shunt Bypass position. (X is TCB #)		
Momentarily depress Reactor Trip pushbutton (2HS-9071-2) on 2C03.		
Verify TCB opens.		
Check 2K12-A10 alarm comes in or reflashes.		
Release XHS/TEST. (X is TCB #)		
Verify Reflash Unit 2K426 in 2C14 reset.		

2.2.1 IF desired to close TCB-2 AND TCB-6, THEN refer to step 2.1. _____

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 13 **DATE:** _____

SYSTEM/DUTY AREA: Control Element Drive Mechanism Control System S5

TASK: Perform control element assembly exercise.

JTA#: ANO2-RO-CEDM-SURV-13

KA VALUE RO: 4.0 SRO: 3.7 KA REFERENCE: 001 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 CLASSROOM: _____

POSITION EVALUATED: RO: _____ SRO: _____

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

TESTING METHOD: SIMULATE: _____ PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 12 minutes

REFERENCE(S): OP 2105.009

_____

EXAMINEE'S NAME: _____ BADGE #: _____

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

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

INITIAL CONDITIONS: 250 EFPD. OP 2105.009 Supplement 2, "CEA Exercise Test" is completed successfully through step 2.5.12 for all CEA's except CEA #46. No T-alt installed on either RSPT.

TASK STANDARD: CEA #46 has been inserted seven (7) steps (5.25 inches) and withdrawn to the programmed insertion limit.

TASK PERFORMANCE AIDS: OP 2105.009 Supplement 2. Complete Table 2 except for CEA 6-46.

SIMULATOR SETUP: CEA's withdrawn to Programmed insertion limit

JOB PERFORMANCE MEASURE

INITIATING CUE:

Complete the CEA Exercise Test for CEA # 46 using OP 2105.009 Supplement 2, beginning with Step 2.5.

Start Time: _____

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1. (Step 2.5.1)	IF CEA movement delayed for extended period, THEN verify Mode Select switch in OFF.	Placed Mode Select switch in off during any extended delay.	N/A SAT UNSAT
(C)	2. (Step 2.5.2)	Verify CEA #46 position within 7 inches of CEA's 1, 47, 48 and 49 throughout exercise. Examiner Note: This step is a continuous action that must be completed while moving CEAs	Observed all Group 6 CEA's within seven (7) inches using CEAC #1, CEAC #2, or PMS indications.	N/A SAT UNSAT
	3. (Step 2.5.3)	Select position indication for CEA # 46.	On panel 2C03, CEA #46 displayed on all available CEAC module displays by one of the following methods: - Standard OM, - CEA group plot (Group 6 selected) - CEA values Page 2 - CEA subgroup plot (Group 6 selected)	N/A SAT UNSAT
(C)	4. (Step 2.5.4)	Verify Group Select switch selected to group containing individual CEA	On panel 2C03, verified group 6 selected.	N/A SAT UNSAT
(C)	5. (Step 2.5.5)	Place the individual CEA selection switches to CEA #46.	On panel 2C03, selected CEA #46. Observed the TENS in "4" and the UNITS in "6". OR Observed CEA #46 individual light ON.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	6. (Step 2.5.6)	Place the mode select switch to MANUAL INDIVIDUAL.	On panel 2C03, placed mode select switch to MI. Observed MI (MANUAL INDIVIDUAL) light ON.	N/A SAT UNSAT
(C)	7. (Step 2.5.7)	Verify CEA #46 at upper electrical limit (UEL).	On insert 2JC-9058, moved CEA 46 to UEL by going to WITHDRAW on CEA insert until #46 upper electrical limit (UEL) red light on. Observed UEL red light ON.	N/A SAT UNSAT
(C)	8. (Step 2.5.8)	Insert CEA #46 seven steps (≥5").	Inserted CEA seven steps (≥5"). Observed insertion of 5.0 inches or greater on CEAC's #1 and #2 displays.	N/A SAT UNSAT
(C)	9 (Step 2.5.9)	Return CEA to UEL.	CEA #46 withdrawn to UEL.	N/A SAT UNSAT
(C)	10. (Step 2.5.10)	Insert CEA #46 to Programmed insertion limit	CEA #46 inserted to programmed insertion limit (UEL - 2 steps). Observed CEA #46 at 148.5" on Pulse counter (149" on CEAC's)	N/A SAT UNSAT
	11. (Step 2.5.11)	Record results.	Using OP 2105.009 Supplement A Table 1, recorded the results of CEA #46 exercise.	N/A SAT UNSAT
EXAMINER'S NOTE: The CEDMCS control may be left in any mode of operation.				
	12. (Step 2.5.12)	WHEN all required CEA movements complete, THEN verify Mode Select switch in OFF.	On insert 2JC-9058, selected off mode of operation.	N/A SAT UNSAT
END				

StopTime: _____

JOB PERFORMANCE MEASURE

Examiner's Copy

INITIAL CONDITIONS:

- 260 EFPD.
- OP 2105.009 Supplement 2, "CEA Exercise Test" is completed successfully through step 2.5.12 for all CEA's except CEA #46.
- No T-alt installed on either RSPT.
- Voltage Traces are not required.

INITIATING CUE:

Complete the CEA Exercise Test for CEA # 46 using OP 2105.009 Supplement 2, beginning with Step 2.5.

JOB PERFORMANCE MEASURE

Examinee's Copy

INITIAL CONDITIONS:

- 260 EFPD.
- OP 2105.009 Supplement 2, "CEA Exercise Test" is completed successfully through step 2.5.12 for all CEA's except CEA #46.
- No T-alt installed on either RSPT.
- Voltage Traces are not required.

INITIATING CUE:

Complete the CEA Exercise Test for CEA # 46 using OP 2105.009 Supplement 2, beginning with Step 2.5.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **CEDM CONTROL SYSTEM OPERATION**	DOCUMENT NO. **2105.009**	CHANGE NO. **028**
	WORK PLAN EXP. DATE **N/A**	
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☐YES ☒NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**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
[signature] 1550	today	0600

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

SUPPLEMENT 2

CEA EXERCISE TEST

This test verifies operability of each CEA per TS surveillance requirement 4.1.3.1.2. It is normally performed quarterly with Reactor in Mode 1 or 2, but can be performed in conjunction with Reactor Startup or trip. CEA traces performed concurrent with exercise to trend coil performance (may be NA'd with I&C concurrence). If troubleshooting or maintenance required, then CEAs will be placed on Hold Bus.

NOTE
This test is considered a trip initiator per COPD 024, Risk Assessment Guidelines.

1.0 INITIAL CONDITIONS

1.1 IF Reactor Trip has occurred,
THEN perform the following:

1.1.1 Verify all CEAs withdrawn > 5 inches prior to trip. N/A

1.1.2 Verify all CEAs at or below lower electrical limit. N/A

1.1.3 Complete section 3.0 Acceptance Criteria. N/A

1.1.4 N/A remaining portions of this supplement. N/A

1.2 IF Reactor Startup has occurred
THEN perform the following:

1.2.1 Verify all CEAs withdrawn or inserted > 5 inches. N/A

1.2.2 Complete section 3.0 Acceptance Criteria. N/A

1.2.3 N/A remaining portions of this supplement. N/A

1.3 Verify voltage trace status as follows:

1.3.1 IF voltage traces desired,
THEN verify the following: N/A

- I&C support available to analyze CEA visicorder traces.
- Visicorder available to record CEA voltage traces.

1.3.2 IF voltage traces NOT desired,
THEN I&C concurrence obtained: ZO

B:ll I+C ______ I&C contact

1.4 Review Limits and Precautions section of this procedure. ZO

1.5 Verify Group 6 NOT inserted beyond the Programmed Insertion Limit. (CR-ANO-2-2005-2193) ZO

2.0 TEST METHOD

NOTE

- CEA Malfunction (2203.003) is applicable during this test if any CEA fails to exercise successfully, drops or appears stuck.
- 2K10-D1, 2K10-E1 and 2K10-G1 will alarm during CEA exercise.
- If I&C concurs, Voltage Traces need NOT be performed.
- If CEA has a known problems (e.g., coil with missing phase), it should be bumped one step and then stopped to allow I&C Maintenance to evaluate for additional problems on coil traces for that CEA. If additional problems are found, then coordinate with I&C Maintenance and System Engineering for additional actions. (CR-ANO-2-2001-0611)

* 2.1 IF required to place CEAs on Hold Bus,
THEN enter Tech Spec 3.1.3.1, Action C
(CEAs inoperable but trippable; no SDM penalty).

* 2.2 IF CEAs placed on Hold Bus for any reason,
THEN perform the following:

2.2.1 Verify CEAs removed from Hold Bus

2.2.2 Exit TS 3.1.3.1.C.

N/A

IF voltage traces desired,
THEN coordinate with I&C to perform voltage traces concurrent with CEA exercises.

N/A

CAUTION

Both PMS and COLSS receive pulse counter input. If CEA pulsed inward too far, the excessive peaking factors generated will render COLSS inoperable. When pulsing CEA in groups 1 through 5, with group out of sequence, this occurs at $\leq$ 142.5". For CEA in any group, this occurs at $\geq$ 10" deviation from its group.

If CEA that is providing position indication for another CEA drops, then associated CEAC will see two dropped CEAs instead of one. Placing associated CEAC in INOP will prevent unnecessary trip if this happens.

Do not simultaneously insert CEAs from Groups 5 and 6 below 146.25 inches. Large Planar Radial Peaking Factors will be applied to CPC calculations, likely resulting in channel trips.

N/A

IF a CEA RSPT is providing position indication to another CEA by installation of a T-Mod,
THEN perform the following prior to exercising CEA that is providing position indication:

N/A

- Using CPC/CEAC Operations (2105.001), place associated CEAC in INOP in all four CPC channels.

(Example: (If CEA 46 RSPT 2 is providing position indication for CEA 1, then place CEAC 2 in INOP prior to exercising CEA 46).

NOTES

- Table 1 may be used as placekeeping guide while performing CEA exercises.
- Group P and Group 6 CEAs should be the first two groups exercised.

2.5 Exercise all CEAs in Table 1 as follows:

* 2.5.1 IF CEA movement delayed for extended period, THEN verify Mode Select switch in OFF.

* 2.5.2 Using operable CEA Position indicators, verify CEA within 7 inches of the other CEAs in the group while exercising CEAs. (TS 3.1.3.1)

2.5.3 On all available CEAC Operator Module digital displays, select position indication for CEA to be exercised.

2.5.4 Verify Group Select switch selected to group containing individual CEA.

2.5.5 Place Individual CEA Selection switches to CEA to be exercised.

RAP

2.5.6 Place Mode Select switch to MANUAL INDIVIDUAL.

2.5.7 Verify CEA to be exercised is at UEL.

NOTE

- CEA insertion is verified to be ≥ 5" by observation of RSPTs. Observing 5.25" change in pulse counter position does NOT mean CEA has moved ≥ 5".
- If all CEAs in the subgroup of CEA being inserted are above upper alarm deadband of 140.83 inches, the CEAC 1 or 2 CEA Deviation annunciators (2K04 J-5/2K04 J-6) will NOT actuate
- Use of CEAC #1 and CEAC #2 standard OM Module to monitor raw input signal is recommended to ensure CEA movement of 5 inches. CEAC group display uses process CEA positions that are rounded off to nearest inch.
- Due to scheduling or component malfunction it is acceptable for CEAs to be inserted to other than Power Operations (2102.004) Attachment D Programmed Insertion Limit.

2.5.8 Insert CEA seven steps (≥ 5 inches by RSPT).

2.5.9 Return CEA to UEL.

2.5.10 Verify CEA returned to position required by Power Operation (2102.004), Programmed CEA Insertion to Minimize CEA Finger Wear (ATTACHMENT D).

2.5.11 Record results on Table 1.

2.5.12 WHEN all required CEA movements complete, THEN verify Mode Select switch in OFF.

2.6 IF either CEAC was placed in INOP for this exercise, THEN use CPC/CEAC Operations (2105.001) to remove from INOP in all four CPC channels. _____

2.7 IF any CEA or CEDMCS circuits require maintenance, THEN perform the following: _____

2.7.1 Complete repairs.

2.7.2 List affected CEAs in step 3.3.

2.8 WHEN CEA testing complete, THEN place the following switches as desired:

2.8.1 Group Select switch

2.8.2 Individual CEA Selection switches

SUPPLEMENT 2

3.0 ACCEPTANCE CRITERIA

3.1 Has each CEA been determined operable by movement of $\geq$ 5 inches in any one direction by RSPT indication? YES NO

3.2 IF NO is circled above,
THEN perform the following:

- Declare affected CEAs inoperable. _____
- Refer to Tech Spec 3.1.3.1. _____
- Notify S/M. _____
- Complete Condition Report. _____

3.3 Comments: _____

_____

_____

_____

Performed By _____ Date _____

_____

4.0 SUPERVISOR REVIEW AND ANALYSIS

4.1 Are CEAs operable as required by Acceptance Criteria? YES NO

4.2 IF answer to 4.1 is NO,
THEN describe action taken below: _____

_____

_____

_____

_____

4.3 Are all administrative requirements of this test satisfied? YES NO

Supervisor _____ Date _____

SUPPLEMENT 2

TABLE 1

CEA#	CEA POSITION INDICATION SELECTED.	CEA SELECT SWITCH CORRECTLY POSITIONED	MODE SELECT SWITCH IN MANUAL INDIVIDUAL.	VERIFY CEA AT UEL.	INSERT CEA ≥ 5 INCHES BY RSPT INDICATION.	RETURN CEA TO UEL.	RETURN CEA TO PROGRAM INSERTION LIMIT AS REQUIRED.	VOLTAGE TRACE (1)	CEA EXERCISE SATISFACTORY?	
	√	√	√	√	√	√	√	√	YES	NO
P-22	✓	✓	✓	✓	✓	✓	✓	✓	✓	
P-23	✓	✓	✓	✓	✓	✓	✓	✓	✓	
P-24	✓	✓	✓	✓	✓	✓	✓	✓	✓	
P-25	✓	✓	✓	✓	✓	✓	✓	✓	✓	
P-26	✓	✓	✓	✓	✓	✓	✓	✓	✓	
P-27	✓	✓	✓	✓	✓	✓	✓	✓	✓	
P-28	✓	✓	✓	✓	✓	✓	✓	✓	✓	
P-29	✓	✓	✓	✓	✓	✓	✓	✓	✓	
6-1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
6-46										
6-47	✓	✓	✓	✓	✓	✓	✓	✓	✓	
6-48	✓	✓	✓	✓	✓	✓	✓	✓	✓	
6-49	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-2	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-3	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-5	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2-6	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2-7	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2-8	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2-9	✓	✓	✓	✓	✓	✓	✓	✓	✓	
4-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	
4-11	✓	✓	✓	✓	✓	✓	✓	✓	✓	
4-12	✓	✓	✓	✓	✓	✓	✓	✓	✓	
4-13	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-14	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-16	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-18	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-20	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-15	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-17	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-19	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-21	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-30	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-32	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-34	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-36	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-31	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-33	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-35	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B-37	✓	✓	✓	✓	✓	✓	✓	✓	✓	

(1) Voltage Traces are not mandatory; NA if voltage traces not obtained.

SUPPLEMENT 2

TABLE 1

CEA#	CEA POSITION INDICATION SELECTED.	CEA SELECT SWITCH CORRECTLY POSITIONED	MODE SELECT SWITCH IN MANUAL INDIVIDUAL.	VERIFY CEA AT UEL.	INSERT CEA ≥ 5 INCHES BY RSPT INDICATION.	RETURN CEA TO UEL.	RETURN CEA TO PROGRAM INSERTION LIMIT AS REQUIRED.	VOLTAGE TRACE (1)	CEA EXERCISE SATISFACTORY?	
	√	√	√	√	√	√	√	√	YES	NO
1-38	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1-40	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1-42	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1-44	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1-39	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1-41	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1-43	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1-45	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-50	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-52	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-54	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-56	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-51	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-53	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-55	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-57	✓	✓	✓	✓	✓	✓	✓	✓	✓	
5-58	✓	✓	✓	✓	✓	✓	✓	✓	✓	
5-59	✓	✓	✓	✓	✓	✓	✓	✓	✓	
5-60	✓	✓	✓	✓	✓	✓	✓	✓	✓	
5-61	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3-62	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3-64	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3-66	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3-68	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3-63	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3-65	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3-67	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3-69	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-70	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-73	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-76	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-79	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2-71	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2-74	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2-77	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2-80	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-72	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-75	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-78	✓	✓	✓	✓	✓	✓	✓	✓	✓	
A-81	✓	✓	✓	✓	✓	✓	✓	✓	✓	

(1) Voltage Traces are not mandatory; NA if voltage traces not obtained.

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 2 **DATE:** _____

SYSTEM/DUTY AREA: Containment S6

TASK: Drain the Containment Sump. (Alternate Path)

JTA#: ANO2-WCO-LRWBMS-NORM-7

KA VALUE RO: 3.9 **SRO:** 4.2 **KA REFERENCE:** 103 A3.01

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 **CLASSROOM:** _____

POSITION EVALUATED: RO: _____ **SRO:** _____

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

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 10 Minutes

REFERENCE(S): OP-2104.014 LRW/BMS operations

EXAMINEE'S NAME: _____ **Badge #:** _____

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

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

INITIAL CONDITIONS:

Containment Sump level ~76%

TASK STANDARD:

2CV-2060-1 closed and Aux building sump level remained <100%.

TASK PERFORMANCE AIDS:

OP 2104.014 Section 20

SIMULATOR SETUP:

Any mode, Containment Sump level ~76%

CV20612 value = 1, ramp = 8 sec, set on a Conditional trigger set for rw_2061o.

Using the monitor function the containment sump level can be adjusted using the ctmwtr name and setting the value to 25,000.

JOB PERFORMANCE MEASURE

INITIATING CUE:

Drain the containment sump to 40% using 2104.014 LRW/BMS operations starting with step 20.1.3

START TIME:_____

	PERFORMANCE CHECKLIST		**STANDARDS**	(Circle One)
Procedure Caution: Containment Sump drainage flow rate is greater than both Aux Building Sump pumps (2P-51A and 2P-51B) flow capacity.				
(C)	1. (Step 20.1.3)	Open the following valves to drain CNTMT sump: Containment Sump Isolation 2CV-2060-1 (2HS-2060-1) Containment Sump Isolation 2CV-2061-2 (2HS-2061-2)	On panel 2C17 placed CMNT sump isolation valve handswitch 2HS-2060-1 to OPEN. On panel 2C16 placed CMNT sump isolation valve handswitch 2HS-2061-2 to OPEN. Observed red lights ON above handswitchs	N/A SAT UNSAT
	2. (Step 20.1.4)	Using level indication or corresponding computer points, monitor the following to prevent overflow: Aux Building sump (2LIS-2000 or 2LIS-2000B) In service Waste tank: - 2T-20A (2LIS-2010) - 2T-20B (2LIS-2012)	On panel 2C14, monitored Aux Building sump level (2LIS-2000 or 2LIS-2000B), and 2T-20A (2LIS-2010) waste tank. OR Monitor Aux Building Sump level and 2T-20A waste tank level using PMS computer	N/A SAT UNSAT
EXAMINER'S NOTE: **The following is the alternate path portion of this JPM**				
	3. (Step 20.1.5)	Cycle 2CV-2061-2 (2HS-2061-2) as necessary to prevent overflowing Aux Building sump. **EXAMINER CUE: If the candidate tells the CRS 2CV-2061-2 has failed open, then instruct candidate to take appropriate action.**	On panel 2C16 placed CMNT sump isolation valve handswitch 2HS-2061-2 to CLOSE. And observed that the valve did not close.	N/A SAT UNSAT
Procedure Note: It is undesirable to drain Containment Sump below indication range.				

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			**STANDARDS**	(Circle One)
(C)	4. (Step 20.1.6)	WHEN draining complete, THEN close the following valves: 2CV-2060-1 (2HS-2060-1) **EXAMINER CUE: If the candidate tells the CRS a Tech Spec entry is required due 2CV-2061-2 not closing acknowledge and report the CRS has entered the appropriate Tech Spec.**	On panel 2C17 placed CMNT sump isolation valve handswitch 2HS-2060-1 to closed**.(Critical)** Observed 2CV-2060-1 closed by the green light ON and red light OFF. **(Not Critical)** Maintained Aux Building sump level <100%. **(Critical)**	N/A SAT UNSAT
END				

STOP TIME:_____

JOB PERFORMANCE MEASURE

Examiner's Copy

INITIAL CONDITIONS:

- Containment Sump level is ~76%
- Steps 20.1.1 and 20.1.2 of 2104.014 LRW/BMS operations are complete

INITIATING CUE:

Drain the containment sump to 40% using 2104.014 LRW/BMS operations starting with step 20.1.3.

JOB PERFORMANCE MEASURE

Examinee's Copy

INITIAL CONDITIONS:

- Containment Sump level is ~76%
- Steps 20.1.1 and 20.1.2 of 2104.014 LRW/BMS operations are complete

INITIATING CUE:

Drain the containment sump to 40% using 2104.014 LRW/BMS operations starting with step 20.1.3.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **LRW AND BMS OPERATIONS**	DOCUMENT NO. **2104.014**	CHANGE NO. **050**
	WORK PLAN EXP. DATE **N/A**	
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☒YES ☐NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these *TRAPS*	**Get these *TOOLS***
Time Pressure	**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
[signature] 1550	today	0600

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

NOTE

- Containment sump level must be > 71% prior to closing the Inside Sump Isolations during Plant Cooldown (2102.010).
- If oil or foreign debris is suspected to be in the sump, then sump level should be maintained > 71%. CR-ANO-1-2005-01994
- 2102.002, Plant Heatup requires > 35% in sump prior to heatup from Mode 5.

20.0 DRAINING CONTAINMENT SUMP

20.1 Normal CNTMT Sump Drain to Aux Building Sump

20.1.1 IF desired to sample Containment Sump,
THEN GO TO "Sampling Containment Sump" section of this procedure.

CAUTION

Containment Sump drainage flow rate is greater than both Aux Building Sump pumps (2P-51A and 2P-51B) flow capacity.

20.1.2 Notify RP to monitor intended water transfer flow path for this evolution. (CR-ANO-2-2006-2706-CA-5)

NOTE

Draining Containment Sump will cause rate of change hi alarm (2K01-H9).

20.1.3 Open the following valves to drain CNTMT sump:

- Containment Sump Isolation 2CV-2060-1 (2HS-2060-1)
- Containment Sump Isolation 2CV-2061-2 (2HS-2061-2)

* 20.1.4 Using level indication or corresponding computer points, monitor the following to prevent overflow:

- Aux Building sump (2LIS-2000A or 2LIS-2000B)
- In service Waste tank:
  - 2T-20A (2LIS-2010)
  - 2T-20B (2LIS-2012)

* 20.1.5 Cycle 2CV-2061-2 (2HS-2061-2) as necessary to prevent overflowing Aux Building sump.

NOTE

It is undesirable to drain Containment Sump below indication range.

20.1.6 WHEN draining complete,
THEN close the following valves:

- 2CV-2061-2 (2HS-2060-1)
- 2CV-2060-1 (2HS-2061-2)

20.1.7 Annotate sump drain in operator logs.

JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 8 DATE: _____

SYSTEM/DUTY AREA: Abnormal/Emergency Operations S7

TASK: Restore component cooling water to reactor coolant pumps (Alternate Path)

JTA#: ANO2-RO-RCP-OFFNORM-9

KA VALUE RO: 3.2 SRO: 2.9 KA REFERENCE: 003 A4.08

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: Perform CLASSROOM: _____

POSITION EVALUATED: RO: _____ SRO: _____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ____ PLANT SITE: ____ CLASSROOM: ____

TESTING METHOD: SIMULATE: _____ PERFORM: _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): EOP 2202.010 Attachment 21

EXAMINEE'S NAME: _____ BADGE# : _____

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

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

INITIAL CONDITIONS: 2A1 is re-energized from SU#2 following a degraded power situation. 2202.010 ATT. 29 steps up to 1.M.7 have been completed. A CCW pump has been restored to service. SW has been aligned to CCW. 2Y1 and 2Y2 are cross-tied.

TASK STANDARD: Controlled bleed off isolated to VCT and CBO relief valve isolated.

TASK PERFORMANCE AIDS: Copy of EOP 2202.010 Attachment 21

SIMULATOR SETUP: Set up CCW valves per EOP 2202.010 Attachment 29 "STARTUP XFM# 2 USAGE" perform actions through step 1.M.6. Close RCP CCW RETURN valve, 2CV-5255-1, 2CV-5254-2 and 2CV-5236-1. NO SIAS actuation and RCP seal temperatures >180.

Set T4 = oe4r2551 (this will trigger T4 when 2CV 5255 red light is energized).

When 2CV 5255-1 is taken to open position, it will trip the breaker

T4=DO_HS_5255_R off (override)

T4=DO_HS_5255_G off (override)

T4=CV52551 = 0.0% (component malfunction)

JOB PERFORMANCE MEASURE

INITIATING CUE:

Restore CCW to the RCP's using EOP 2202.010 Attachment 21.

START TIME: _____

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1. (Step 2 A)	Verify RCP bleed-off to VCT valves open.	On panel 2C17, verified 2CV-4846-1 red light ON; control switch in OPEN. On panel 2C16 verified 2CV-4847-2 red light ON; control switch in OPEN.	N/A SAT UNSAT
	2. (Step 2 B)	Verify RCP Bleed-off Relief Isolation to Quench Tank open.	On panel 2C09, verified 2CV-4856 red light ON; key-switch in LOCKED OPEN.	N/A SAT UNSAT
(C)	3. (Step 3)	Determine RCP Seal temperature. **EXAMINER'S NOTE: RCP seal temperature should be > 180ºF and step 3 will be NA.**	On panel 2C14 or on PMS computer determined that RCP seal temperatures is > 180ºF and Step 3 is NA.	N/A SAT UNSAT
	4. (Step 4 A)	Verify RCP CCW Return valve (2CV-5255-1) CLOSED.	On panel 2C17, verified 2CV-5255-1 CLOSED. Observed green light ON; red light OFF above handswitch.	N/A SAT UNSAT
(C)	5. (Step 4 B)	Open RCP CCW Supply valve (2CV-5236-1).	On panel 2C17, placed handswitch for 2CV-5236-1 in "OPEN". Observed green light OFF; red light ON.	N/A SAT UNSAT
(C)	6. (Step 4 C)	Open RCP CCW Return valve (2CV-5254-2).	On panel 2C16, Verified handswitch for 2CV-5254-2 "OPEN". Observed green light OFF; red light ON.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
EXAMINER'S NOTE: **When 2CV-5255-1 is taken to OPEN, the breaker will trip and cannot be reset. The valve will be bound closed.**				
(C)	7. (Step 4 D)	Modulate RCP CCW Return valve (2CV-5255-1) OPEN. **EXAMINER CUE:** **If WCO sent to the valve; 2CV-5255-1 cannot be opened.** **If AO sent to the breaker, 2B53-G4; the breaker for 2CV-5255-1 cannot be reset.**	On panel 2C17, took handswitch for 2CV-5255-1 to "OPEN" for one (1) second then released. Observed red and green lights OFF. EXAMINEE may ask to dispatch a NLO to the valve and or breaker.	N/A SAT UNSAT
EXAMINER'S NOTE: **The examinee may elect to monitor RCP seal cooldown before making the decision that CCW cannot be restored. This monitoring of RCP seal cooldown may take 10 minutes to validate that 2CV-5255-1 did not open.** **The examinee should go to step 5 of Attachment 21.**				
	8. (Step 5)	Verify ALL RCP's secured.	On panel 2C04, observed 2P32A, B, C, and D RCP handswitches in STOP or PTL. Observed handswitch is green flagged; green light ON and red light OFF.	N/A SAT UNSAT
	9. (Step 5 A)	Close 2CV-5254-2.	On panel 2C16, placed handswitch for 2CV-5254-2 to "CLOSE" Observed green light ON; red light OFF.	N/A SAT UNSAT
	10. (Step 5 A)	Close 2CV-5236-1.	On panel 2C17, placed handswitch for 2CV-5236-1 to "CLOSE" Observed green light ON; red light OFF.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	11. (Step 5 B 1)	Close RCP bleedoff to VCT valves.	On panel 2C17, placed handswitch for 2CV-4846-1 to "CLOSE." On panel 2C16, placed handswitch for 2CV-4847-2 to "CLOSE." For each valve, observed green light ON; red light OFF.	N/A SAT UNSAT
(C)	12. (Step 5 B 2)	Close RCP bleedoff relief isolation to quench tank valve (2CV-4856).	On panel 2C09, placed handswitch for 2CV-4856 to "CLOSE" Observed green light ON; red light OFF.	N/A SAT UNSAT
END				

STOP TIME: _____

JOB PERFORMANCE MEASURE

Examiner's Copy

INITIAL CONDITIONS:

- 2A1 is re-energized from SU#2 following a degraded power situation.
- 2202.010 ATT. 29 steps up to 1.M.7 have been completed.
- CCW pumps have been restored.
- SW has been aligned to CCW.
- 2Y1 and 2Y2 are cross connected.

INITIATING CUE:

Restore CCW to the RCP's using EOP 2202.010 Attachment 21.

JOB PERFORMANCE MEASURE

Examinee's Copy

INITIAL CONDITIONS:

- 2A1 is re-energized from SU#2 following a degraded power situation.
- 2202.010 ATT. 29 steps up to 1.M.7 have been completed.
- CCW pumps have been restored.
- SW has been aligned to CCW.
- 2Y1 and 2Y2 are cross connected.

INITIATING CUE:

Restore CCW to the RCP's using EOP 2202.010 Attachment 21.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **STANDARD ATTACHMENTS** SET #	DOCUMENT NO. **2202.010**	CHANGE NO. **015**
	WORK PLAN EXP. DATE **N/A**	
	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☐YES ☒NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these *TRAPS*	**Get these *TOOLS***
Time Pressure	**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**	**054**

ATTACHMENT 21
RESTORATION OF CCW TO RCPs

1. IF SW NOT aligned to CCW AND CCW available,
   THEN perform the following:

   A. Override and open at least ONE SW to CCW/ACW Return valve:

      - 2CV-1543-1
      - 2CV-1542-2

CAUTION

Supplying ACW flow and CCW cooling from a single SW pump may result in low SW header pressure.

   B. Override and throttle at least ONE SW to CCW/Main Chillers Supply valve:

      - 2CV-1530-1
      - 2CV-1531-2

   C. Maintain SW header pressure greater than 85 psig.

2. Align Controlled Bleedoff as follows:

   A. IF SIAS OR CIAS NOT actuated,
      THEN verify RCP Bleedoff to VCT valves open:

      - 2CV-4846-1
      - 2CV-4847-2

   B. Verify RCP Bleedoff Relief Isolation to Quench Tank valve (2CV-4856) open.

3. IF RCP seal temperatures less than 180°F,
   THEN restore CCW to RCPs by performing the following:

   A. Verify ANY CCW pump in service.

   B. Verify open RCP CCW Supply valve (2CV-5236-1).

   C. Verify open RCP CCW Return valve (2CV-5254-2).

   D. Verify open RCP CCW Return valve (2CV-5255-1).

   E. IF unexplained CCW Surge Tank level changes observed,
      THEN perform the following:

      1) Verify ALL RCPs stopped.

      2) Isolate CCW to RCPs.

      3) Verify RCP Bleedoff to VCT valves closed:

         - 2CV-4846-1
         - 2CV-4847-2

      4) Verify RCP Bleedoff Relief Isolation to Quench Tank valve (2CV-4856) closed.

4. IF RCP seal temperatures 180°F or greater,
   THEN restore CCW to RCPs as follows:

   A. Verify RCP CCW Return valve (2CV-5255-1) closed.

   B. Verify RCP CCW Supply valve (2CV-5236-1) open.

   C. Verify RCP CCW Return valve (2CV-5254-2) open.

   D. Throttle open RCP CCW Return valve (2CV-5255-1) with a single 1 second modulation.

   E. Verify ANY CCW pump in service.

   F. IF unexplained CCW Surge Tank level changes observed,
      THEN perform the following:

      1) Verify ALL RCPs stopped.

      2) Isolate CCW to RCPs.

      3) Verify RCP Bleedoff to VCT valves closed:

         - 2CV-4846-1
         - 2CV-4847-2

      4) Verify RCP Bleedoff Relief Isolation to Quench Tank valve (2CV-4856) closed.

   G. IF RCP seal temperatures greater than 300°F,
      THEN use PMS to monitor seal cooldown rate:

RCP	CONTROLLED BLEEDOFF	LOWER SEAL CAVITY
A	T6008	T6009
B	T6018	T6019
C	T6028	T6029
D	T6038	T6039

(Step 4 continued on next page)

4. (continued)

CAUTION

Cooldown rates greater than 100°F/hr with seal temperatures180°F or greater may result in RCP Seal failure.

NOTE

Each 1 second modulation equals 80 to 100 gpm.

H. Maintain RCP seal cooldown rate less than 100°F/hr by throttling 2CV-5255-1 with one second modulations.

I. WHEN RCP Seal temperature stable for 15 minutes,
THEN fully open 2CV-5255-1.

5. IF EITHER of the following occur,

- CCW to RCPs can NOT be restored
- CCW Surge Tank levels lower to 13% following restoration

THEN verify ALL RCPs stopped.

A. Isolate CCW to RCPs by closing the following valves:

- 2CV-5254-2
- 2CV-5236-1
- 2CV-5255-1

B. Isolate Controlled Bleedoff as follows:

1) Verify RCP Bleedoff to VCT valves closed:

- 2CV-4846-1
- 2CV-4847-2

2) Close RCP Bleedoff Relief Isolation to Quench Tank valve (2CV-4856).

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 14 **DATE:** _____

SYSTEM/DUTY AREA: Component Cooling Water System S8

TASK: Shift Running CCW pumps

JTA#: ANO2-RO-CCW-NORM-10

KA VALUE RO: 3.3 **SRO:** 3.1 **KA REFERENCE:** 008 A4.01

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 **CLASSROOM:** _____

POSITION EVALUATED: RO: _____ **SRO:** _____

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

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 8 Minutes

REFERENCE(S): OP-2104.028 Component Cooling Water System Operations

EXAMINEE'S NAME: _____ **Badge #:** _____

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

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

INITIAL CONDITIONS:

2P-33B running in a normal configuration. Component Cooling water loops are cross tied.

Maintenance requests that 2P-33A be started and ran in single pump operation for PMT after pump rebuild.

TASK STANDARD:

2P33A running supplying CCW and 2P33B & 2P-33C in PULL-TO-LOCK.

TASK PERFORMANCE AIDS:

OP 2104.028 Section 18.2.5

SIMULATOR SETUP:

Any power level or mode.
2P-33B CCW pump in service with CCW loops cross tied.

JOB PERFORMANCE MEASURE

INITIATING CUE:

Start 2P-33A and secure 2P-33B for PMT run following maintenance using OP 2104.028 Step 18.2.5.

START TIME:_____

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
Procedure Note: 2P-33A is the least preferred pump to run due to Cross Over valve interlocks. 2P-33B/C handswitches should be placed in PTL whenever 2P-33A is in service.				
	1. (Step 18.2.5 A & B)	Contact AO to vent 2P-33A. **EXAMINER CUE:** **AO reports casing vented and 2CCW-1001 closed.**	Using telephone or radio contacted AO and directed him to vent 2P-33A Casing, using 2CCW-1001.	N/A SAT UNSAT
(C)	2. (Step 18.2.5 C)	Verify 2P-33C handswitch (2HS-5234) in PTL.	On panel 2C14, placed 2P-33C handswitch (2HS-5234) in Pull-To-Lock.	N/A SAT UNSAT
(C)	3. (Step 18.2.5 D)	Start 2P-33A. **EXAMINER CUE:** **If requested 2P-33A is running satisfactory.**	On panel 2C14, took 2P-33A handswitch (2HS-5225) to START and released handswitch. Observed red light ON above handswitch.	N/A SAT UNSAT
(C)	4. (Step 18.2.5 E)	Place 2P-33B handswitch (2HS-5228) to PTL.	On panel 2C14, placed 2P-33B handswitch (2HS-5228) in Pull-To-Lock. Observed 2K-12 PUMP 2P-33A/B/C LOCKED alarm. (Not Critical)	N/A SAT UNSAT
	5. (Step 18.2.5 F)	Observe normal flow and discharge pressure. **EXAMINER CUE:** **Local operator reports discharge pressure 110 psig locally.**	On panel 2C14, observed CCW flow between 1000 to 3000 gpm. Directed operator to observe discharge pressure between 100 to 120 psig locally.	N/A SAT UNSAT
END				

STOP TIME:_____

JOB PERFORMANCE MEASURE

Examiner's Copy

INITIAL CONDITIONS:

2P-33B is running in a normal configuration.

Maintenance requests that 2P-33A be started and ran in single pump operation for PMT after pump rebuild.

INITIATING CUE:

Start 2P-33A and secure 2P-33B for PMT run following maintenance using OP 2104.028 Step 18.2.5.

JOB PERFORMANCE MEASURE

Examinee's Copy

INITIAL CONDITIONS:

2P-33B is running in a normal configuration.

Maintenance requests that 2P-33A be started and ran in single pump operation for PMT after pump rebuild.

INITIATING CUE:

Start 2P-33A and secure 2P-33B for PMT run following maintenance using OP 2104.028 Step 18.2.5.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **COMPONENT COOLING WATER SYSTEM OPERATIONS**

SET #

DOCUMENT NO.	CHANGE NO.
2104.028	**038**
WORK PLAN EXP. DATE **N/A**	
SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
TEMP MOD ☒YES ☐NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**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**	**054**

NOTE

2P-33A is the least preferred pump to run due to Cross Over valve interlocks. 2P-33B/C handswitches should be placed in PTL whenever 2P-33A is in service.

18.2.5 Perform the following to start 2P-33A AND secure 2P-33B:

A. Throttle open 2P-33A Casing Vent (2CCW-1001).

B. WHEN solid stream of water appears,
THEN close 2CCW-1001.

C. Verify 2P-33C handswitch (2HS-5234) in PTL.

D. Place 2P-33A handswitch (2HS-5225) to START.

E. Place 2P-33B handswitch (2HS-5228) to PTL.

F. Observe the following:

- Normal flow 1000 to 3000 gpm (2FIS-5202)
- 2P-33A discharge pressure 100 to 120 psig (2PI-5225)

NOTE

2P-33A is the least preferred pump to run due to Cross Over valve interlocks. 2P-33B/C handswitches should be placed in PTL whenever 2P-33A is in service.

18.2.6 Perform the following to start 2P-33A AND secure 2P-33C:

A. Throttle open 2P-33A Casing Vent (2CCW-1001).

B. WHEN solid stream of water appears,
THEN close 2CCW-1001.

C. Verify 2P-33B handswitch (2HS-5228) in PTL.

D. Place 2P-33A handswitch (2HS-5225) to START.

E. Place 2P-33C handswitch (2HS-5234) to PTL.

F. Observe the following:

- Normal flow 1000 to 3000 gpm (2FIS-5202)
- 2P-33A discharge pressure 100 to 120 psig (2PI-5225)

JOB PERFORMANCE MEASURE					
JPM#	ANO-2-JPM-NRC-AACLS	REV	11		PAGE 1 of 7

SYSTEM/DUTY AREA: Diesel Generator System (Alternate Path) P1

TASK: Start up the AAC diesel generator manually locally during a Loss of Offsite Power

JTA # : ANO2-AO-AACDG-OFFNORM-18

KA VALUE **RO:** 4.0 **SRO:** 4.3 **KA REFERENCE:** 064 A4.01

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: Simulate **SIMULATOR:** _____ **CLASSROOM:** _____

POSITION EVALUATED: **RO:** _____ **SRO:** _____

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

TESTING METHOD: **SIMULATE:** _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 20 minutes

REFERENCE(S) OP 2104.037, Exhibit 1

EXAMINEE'S NAME: _____ **Badge #:** _____

EVALUATOR'S NAME: _____ **DATE:** _____

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:** _____

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

SIGNED: _____ **DATE:** _____

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

INITIAL CONDITIONS:

The following conditions exist:

The reactor has tripped due to a loss of off-site power.

Both emergency diesel generators are tied to their respective buses.

An attempt to start the AACDG from the Control Room to energize 4160v Non-vital bus 2A1 was unsuccessful.

TASK STANDARD:

This is an alternate path JPM.

The AAC Diesel has been started and is at 4160 V and 900 rpm with the output breaker (2A-1001) closed. The 480V bus 2B16 has been powered from the AAC diesel generator.

TASK PERFORMANCE AIDS:

OP 2104.037 Exhibit 1

INITIATING CUE:

Start the AAC Diesel Generator using OP 2104.037 Exhibit 1 and bring the unit up to rated speed and voltage carrying house loads.

START TIME:_____

EXAMINER'S NOTE:

Provide examinee with copy of 2104.037, Exhibit 1

If asked about the conditions of the alarms, tell the examinee that the only alarm in is H-3, GENERATOR CIRCUIT BREAKER OPEN.

If asked if 125 VDC is available, tell them that the indications for bus availability are as seen (assumes no actual maintenance in progress)

		PERFORMANCE CHECKLIST	STANDARDS	(Circle One)
Procedure Note: • This Exhibit used to perform Local start of AAC Generator as directed by Attachment E. • A Local Start is performed if PC on 2C14 AND 2C435 have both failed.				
(C)	1. (Step 1.1)	Place "Local/Remote" switch in LOCAL. POSITIVE CUE: "Local/Remote" switch indicates LOCAL.	On panel 2C-440, placed the "Local/Remote" switch (2HS-7118) in LOCAL.	N/A SAT UNSAT
	2. (Step 1.2)	Start the AAC Diesel using the local start switch. **EXAMINER'S NOTE:** **Provide the following cue after ~ 35 seconds when the local start switch is taken to START.** **EXAMINER'S CUE:** **There has been NO change in AAC diesel generator frequency or noise level.**	On panel 2C-440 turned the local control switch CW to start (2HS-7117).	N/A SAT UNSAT
Examiner's NOTE: Step 2 requires a transition to the AAC diesel engine room.				
Procedure Note: If 125VDC control power NOT available the following apply: • Manual operation required for Air Start and Pre-lube Solenoid valves • Local operation required to open and close 2A9 breakers • Manual operation required for 2B16 supply breakers				

	3. (Step 2.1)	Open the pre-lube pump solenoid (2SV-7224) for >10 seconds. **EXAMINER'S CUE:** **Air noise is heard.**	On the south side of the engine at the generator end, rotated the manual operator of 2SV-7224 CW to open for >10 seconds.	N/A SAT UNSAT
(C)	4. (Step 2.2)	Open EITHER of the air start solenoid valves: - 2SV-7222 OR - 2SV-7223 **EXAMINER'S CUE:** **Engine speed and noise levels are rising.**	On the south side of the engine at the generator end, rotated the manual operator of one of the air start solenoid valves CW to open. Looked for an increase in engine noise and/or discharge of oil and air from the air start motors.	N/A SAT UNSAT
	5. (Step 2.3)	Close the air start solenoid valve that was opened.	On the south side of the engine at the generator end, rotated the manual operator for the air start solenoid valve CCW to close.	N/A SAT UNSAT
	6. (Step 2.3)	Close the pre-lube solenoid (2SV-7224).	On the south side of the engine at the generator end, rotated the manual operator of 2SV-7224 CCW to close.	N/A SAT UNSAT
	7. (Step 3)	Verify the AAC Diesel Generator is at rated speed and voltage. **EXAMINER'S CUE:** **Frequency indicates 60 Hz and voltage indicates 4160V.**	On panel 2C-440, observed generator frequency at 60 Hz and voltage at 4160V.	N/A SAT UNSAT

EXAMINER'S NOTE: **When the examinee inspects the condition of 2A-1001, provide the NEGATIVE CUE first to indicate that the breaker has NOT automatically closed. Once the action has been taken to close the breaker, provide the POSITIVE CUE.**				
(C)	8. (Step 4.1)	Verify the AAC Generator Output Breaker (2A-1001) is CLOSED **EXAMINER'S CUE:** **The green breaker OPEN light is lit.** **AND** **The white breaker spring charging light is lit.** **EXAMINER'S CUE:** **The Red breaker CLOSED light is lit.**	Observed breaker position indication on the door of 2A-1001. Rotated breaker local control switch for 2A-1001 to the CLOSE position.	N/A SAT UNSAT
TRANSITION NOTE: Go to the upstairs area of the switchgear room.				
	9. (Step 4.2)	Verify the London Feed to MCC 2B161 breaker 2B16-A1 is OPEN. **EXAMINER'S CUE:** **Green OPEN light is lit on 2B16-A1 and mechanical position indicator showing green open**	Observed the mechanical position indicator breaker for 2B16-A1 to show green open and the green breaker position indication light is lit.	N/A SAT UNSAT
	10. (Step 4.3)	Verify Load Center 2B16 Supply from the AAC diesel (2B16-B1) is CLOSED. **EXAMINER'S CUE:** **Red CLOSED light is lit on 2B16-B1 and mechanical position indicator showing red closed.**	Observed the mechanical position indicator breaker for 2B16-B1 to show red closed and the red breaker position indication light is lit.	N/A SAT UNSAT
END				

STOP TIME: _____

Examiner's Copy

INITIAL CONDITIONS

The following conditions exist:

The reactor has tripped due to a loss of off-site power.
Both emergency diesel generators are tied to their respective buses.
An attempt to start the AACDG from the Control Room to energize 4160v Non-vital bus 2A1 was unsuccessful.

INITIATING CUE:

Start the AAC Diesel Generator using OP 2104.037 Exhibit 1.
Bring the unit up to rated speed and voltage carrying house loads.

Examinee's Copy

INITIAL CONDITIONS

The following conditions exist:

The reactor has tripped due to a loss of off-site power.
Both emergency diesel generators are tied to their respective buses.
An attempt to start the AACDG from the Control Room to energize 4160v Non-vital bus 2A1 was unsuccessful.

INITIATING CUE:

Start the AAC Diesel Generator using OP 2104.037 Exhibit 1.
Bring the unit up to rated speed and voltage carrying house loads.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **ALTERNATE AC DIESEL GENERATOR OPERATIONS** SET #	DOCUMENT NO. **2104.037**	CHANGE NO. **019**
	WORK PLAN EXP. DATE **N/A**	
	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☐YES ☒NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these *TRAPS*	**Get these *TOOLS***
Time Pressure	**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	054

2104.037 EXHIBIT 1 01/25/10

AAC GENERATOR LOCAL START AND STOP

NOTE

- This Exhibit used to perform Local start of AAC Generator as directed by Attachment E.
- A Local Start is performed if PC on 2C14 AND 2C435 have both failed.

1.0 IF 125V DC available,
THEN perform the following:

1.1 Place Local/Remote switch (2HS-7118) in LOCAL on 2C440.

1.2 Place AND hold Engine Control switch (2HS-7117) to START for ~ 35 seconds OR until generator frequency comes on scale

1.3 IF AAC engine fails to start from 2C440,
THEN attempt to start engine as though 125V DC is NOT available.

NOTE

If 125VDC control power NOT available the following apply:

- Manual operation required for Air Start and Pre-lube Solenoid valves
- Local operation required to open and close 2A9 breakers
- Manual operation required for 2B16 supply breakers

2.0 IF 125V DC NOT available,
THEN perform the following:

2.1 Manually operate Control Air to 2P-244 Pre-lube Pump solenoid (2SV-7224) by rotating manual operator stem clockwise.

2.2 WHEN > 10 seconds have elapsed,
THEN manually operate either 2K-9 Air Start Solenoid (2SV-7222 OR 2SV-7223) by slowly rotating manual operator stem clockwise.

2.3 WHEN engine starts,
THEN perform the following:

- Manually disengage Air Start Solenoid manual operator stem by rotating stem counter-clockwise.
- Rotate 2SV-7224 stem counter-clockwise.

3.0 Verify the following:

- AAC Gen voltage ~ 4160 volts using Volt Raise/Lower switch (2HS-7116).
- AAC Gen frequency ~ 60 Hz (900 RPM) using Speed Raise/Lower switch (2HS-7115).

4.0 Verify the following breaker positions:

4.1 AAC Generator Output breaker (2A-1001) closed.

4.2 Normal Supply from AP&L to LC 2B16 (2B16-A1) open.

4.3 AAC Generator Output to LC 2B16 (2B16-B1) closed.

5.0 Return to procedure in effect for AAC Generator loading.

SYSTEM/DUTY AREA: Steam Dump & Bypass Control **P2**

TASK: Operate the SDBCS valves locally. (Upstream Atmospheric Dump Valve "A")

JTA #: ANO2-AO-SDBCS-OFFNORM-10

KA VALUE RO: 3.0 **SRO:** 3.1 **KA REFERENCE:** 041 A4.08

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: Simulate **SIMULATOR:** _____ **CLASSROOM:** _____

POSITION EVALUATED: RO: _____ **SRO:** _____

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

TESTING METHOD: SIMULATE: _____ **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 minutes

REFERENCE(S): OP 2105.008

EXAMINEE'S NAME: _____ **BADGE#:** _____

EVALUATOR'S NAME: _____ **DATE:** _____

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**

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

SIGNED: _____ **DATE:** _____

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

INITIAL CONDITIONS:

- The plant is in Mode 3 due to a station blackout.
- The MSIV's are closed.
- Instrument Air is not available from Unit 1.
- 2CV-1002 (Isolation MOV for "A" Upstream Atmospheric Dump Valve) is closed
- The CRS has directed locally opening 2CV-1002 when directed by procedure.
- 2PI-1007 Main steam pressure gauge has been aligned IAW 2105.008 Exhibit 2.

TASK STANDARD: "A" Upstream Atmospheric Dump Valve (2CV-1001) has been throttled open to control 'A' SG pressure.

TASK PERFORMANCE AIDS: OP 2105.008 Exhibit 2; flashlight

INITIATING CUE:

Take local manual control of the "A" Upstream Atmospheric Dump Valve 2CV-1001 using OP 2105.008 Exhibit 2 and modulate to maintain S/G pressure 950 – 1000 psig.

START TIME: _____

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
EXAMINER'S NOTES: **1. Two flashlights are required for lighting. One for the instructor and one for the student** **2. Dump valves are reverse seating. Air is on the bottom of valve actuator and valve is air to close. Therefore when valve strokes downward; valve is opening.** **3. The positioner is reverse acting. Therefore if the student operates the bleed valve on the outlet of the I/P the dump valve will not open.** **4. 2CV-1001 is currently failed open due to loss of all instrument air.**				
Procedure Note: • ADVs fails open on loss of air with selector switch in OPER. • Valves are reverse seating.				
(C)	1. (Step 4.1)	Place the handle position selector to "MAN". **EXAMINER'S CUE:** **Handle position selector switch in "MAN"**	At 2CV-1001 actuator, rotated handle position selector switch to "MAN".	N/A SAT UNSAT
(C)	2. (Step 4.2)	Rotate handwheel clockwise until resistance felt. **EXAMINER'S CUE:** **Handwheel rotated CW and resistance felt**	Locally, rotated 2CV-1001 handwheel CW until resistance felt	N/A SAT UNSAT
	3. (Step 4.3)	Verify ADV fully closed. **EXAMINER'S CUE:** **Valve position is as indicated.**	Locally verified valve position using stem indication.	N/A SAT UNSAT
(C)	4. (Step 4.4)	Place handle position selector to "LOCK" **EXAMINER'S CUE:** **Handle position selector in "LOCK"**	Locally, rotated handle position selector to "LOCK" (Left to center if facing straight on)	N/A SAT UNSAT
(C)	5. (Step 4.5)	Isolate instrument air to diaphragm of 2CV-1001 (2IA-287) **EXAMINER'S CUE:** **Resistance felt with CW rotation.**	Closed 2IA-287 by rotating hand wheel CW until resistance felt.	N/A SAT UNSAT

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
EXAMINER'S NOTE: **1. The following step requires that the correct bleed valve is opened and the plug removed. If the plug is not removed the task is not successful.** **2. There are three bleed valves. If the I/P output to the positioner bleed valve is operated instead of one of the two listed the task is not successful.**				
(C)	6. (Step 4.6 & 4.7)	Open applicable local air bleed off valve for 2CV-1001. **EXAMINER'S CUE:** **Air bleed observed by feel and / or sound coming from bleed-off port.**	At 2CV-1001, opened one of the following local air bleedoff valves by rotating valve CCW and removing the cap from the bleed port. 1. Air supply to the positioner. 2. Positioner output to the operating diaphragm.	N/A SAT UNSAT
(C)	7. (Step 4.8)	Manually open ADV isolation MOV as directed. (2CV-1002) **EXAMINER'S CUE:** **Valve stem is in the open position**	Placed 2CV-1002 in the open position by rotating the hand wheel in the counter-clockwise.	N/A SAT UNSAT
EXAMINER'S NOTES: **1. Dump valves are reverse seating. Air is on bottom of valve and valve is air to close. Therefore when valve strokes downward valve is opening.** **2. The dump valve will fail open rapidly if handle position selector held in the OPER position. The candidate should transition from OPER back to LOCK back to OPER while monitoring Steam Generator Pressure.**				
Procedure Caution: ADV will fail open rapidly when handle position selector placed in OPER.				
(C)	8. (Step 4.9)	Place handle position selector to "OPER". **EXAMINER'S CUE:** **Handle position selector in "OPER", the valve is opening and pressure is slowly lowering.**	Placed handle position selector to OPER	N/A SAT UNSAT

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	9. (Step 4.10)	When desired valve position is obtained, place handle position selector to "LOCK". **EXAMINER'S CUE:** **2CV-1001 valve stops movement. S/G pressure is ~ 975 psia and stable.**	Placed the handle position selector to LOCK when the desired valve position was obtained.	N/A SAT UNSAT
END				

STOP TIME: _____

Examiner's Copy

INITIAL CONDITIONS:

- The plant is in Mode 3 due to a station blackout.
- The MSIV's are closed.
- Instrument Air is not available from Unit 1.
- 2CV-1002 (Isolation MOV for "A" Upstream Atmospheric Dump Valve) is closed
- The CRS has directed locally opening 2CV-1002 when directed by procedure.
- 2PI-1007 Main steam pressure gauge has been aligned IAW 2105.008 Exhibit 2.

INITIATING CUE:

Take local manual control of the "A" Upstream Atmospheric Dump Valve 2CV-1001 using OP 2105.008 Exhibit 2 and modulate to maintain S/G pressure 950 – 1000 psig.

Examinee's Copy

INITIAL CONDITIONS:

- The plant is in Mode 3 due to a station blackout.
- The MSIV's are closed.
- Instrument Air is not available from Unit 1.
- 2CV-1002 (Isolation MOV for "A" Upstream Atmospheric Dump Valve) is closed
- The CRS has directed locally opening 2CV-1002 when directed by procedure.
- 2PI-1007 Main steam pressure gauge has been aligned IAW 2105.008 Exhibit 2.

INITIATING CUE:

Take local manual control of the "A" Upstream Atmospheric Dump Valve 2CV-1001 using OP 2105.008 Exhibit 2 and modulate to maintain S/G pressure 950 – 1000 psig.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **STEAM DUMP AND BYPASS CONTROL SYSTEM OPERATIONS**	DOCUMENT NO. **2105.008**	CHANGE NO. **022**
	WORK PLAN EXP. DATE **N/A**	
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☐YES ☒NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these ***TRAPS***	Get these ***TOOLS***
Time Pressure	**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**	**054**

2105.008 EXHIBIT 2 Revised 07/21/10

MANUAL OPERATION OF UPSTREAM ATMOSPHERIC DUMP VALVES

NOTE

- ADVs fails open on loss of air with selector switch in OPER.
- valves are reverse seating.

*1.0 IF desired to locally monitor A S/G pressure on 2PI-1007, THEN perform the following:

1.1 Verify pipe cap installed downstream of 2MS-3005.

1.2 Open 2PI-1007 and 2CV-1001 Header Drain Isolation (2MS-3005).

1.3 Slowly open 2PI-1007 and 2CV-1001 Header Drain Isolation (2MS-3006).

1.4 Verify 2PI-1007 local tubing isolation valve open.

*2.0 IF desired to locally monitor B S/G pressure on 2PI-1051, THEN perform the following:

2.1 Verify instrument tap capped downstream of 2MS-3008.

2.2 Open 2PI-1051 and 2CV-1051 Header Vent Isolation (2MS-3007).

2.3 Slowly open 2PI-1051 and 2CV-1051 Header Vent Isolation (2MS-3008).

2.4 Verify 2PI-1051 local tubing isolation valve open.

3.0 IF desired to **FAIL OPEN** Upstream Atmospheric Dump valve, THEN perform the following:

3.1 Verify Handle Position Selector to OPER.

3.2 Isolate air to diaphragm by closing appropriate valve:

- For 2CV-1001: IA to 2CV-1001 (2IA-287)
- For 2CV-1051: IA to 2CV-1051 (2IA-94)

3.3 Remove cap from local air bleed off valve.

3.4 Open air bleed off valve.

3.5 Manually open ADV Isolation MOV as directed:

- For 2CV-1001: 2CV-1002
- For 2CV-1051: 2CV-1052

4.0 IF desired to **THROTTLE** Upstream Atmospheric Dump valve, THEN perform the following:

4.1 Place Handle Position Selector to MAN.

4.2 Rotate handwheel clockwise until resistance felt.

4.3 Verify ADV fully closed.

4.4 Place Handle Position Selector to LOCK.

4.5 Isolate air to diaphragm by closing appropriate valve:

- For 2CV-1001: IA to 2CV-1001 (2IA-287)
- For 2CV-1051: IA to 2CV-1051 (2IA-94)

4.6 Remove cap from local air bleed off valve.

4.7 Open air bleed off valve.

4.8 Manually open ADV Isolation MOV as directed:

- For 2CV-1001: 2CV-1002
- For 2CV-1051: 2CV-1052

CAUTION

ADV will fail open rapidly when handle position selector placed in OPER.

4.9 To open ADV, place Handle Position Selector to OPER.

4.10 WHEN desired valve position obtained, THEN place Handle Position Selector to LOCK.

4.11 To close ADV, perform the following:

4.11.1 Place handle position selector to MAN.

4.11.2 Rotate handwheel clockwise until desired position obtained.

4.11.3 Place handle position selector to LOCK.

JOB PERFORMANCE MEASURE					
	ANO-2-JPM-NRC-SFPAW	REV	17		PAGE 1 of 8

SYSTEM/DUTY AREA: Spent Fuel Pool Cooling System **P3**

TASK: Line up to fill the spent fuel pool from the RWT

JTA # : ANO2-WCO-SFP-NORM-2

KA VALUE **RO:** 3.1 **SRO:** 3.5 **KA REFERENCE:** 033 A2.03

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: **Simulate** **SIMULATOR:** _____ **CLASSROOM:** _____

POSITION EVALUATED: **RO:** _____ **SRO:** _____

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

TESTING METHOD: **SIMULATE:** X **PERFORM:** _____

APPROXIMATE COMPLETION TIME IN MINUTES: 20 minutes

REFERENCE(S) OP 2104.006, Section 11.0

EXAMINEE'S NAME: _____ **BADGE#:** _____

EVALUATOR'S NAME: _____ **DATE:** _____

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:** _____

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

SIGNED: _____ **DATE:** _____

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall verify the candidates have been briefed in accordance with Parts A, C, and D of NUREG 1021 Appendix E.

INITIAL CONDITIONS:

The following conditions exist:

1. The Plant is shutdown and in Mode 6 with the core off loaded.
2. 2K11-J5, FUEL POOL LEVEL LOW is in alarm.
3. SFP level is 401.25 feet due to a leak on a SFP cooling pump packing gland which has been isolated
4. SFP purification is aligned to the RWT
5. An operator is stationed at the SFP to monitor level increase.
6. Cask loading operations are NOT in progress.

TASK STANDARD:

Spent fuel pool level has been raised to 401.5 feet by adding water from the RWT.

TASK PERFORMANCE AIDS:

1. OP 2104.006, Section 11.0

INITIATING CUE: Add water to the spent fuel pool (SFP) from the refueling water tank (RWT) using OP 2104.006, Section 11.0 to raise level to 401.5 feet.

START TIME: _____

EXAMINER'S NOTE:

Provide examinee with OP 2104.006, Section 11.0.

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
TRANSITION NOTE: **Go to RAB elevation 335', Spent Fuel Pool Pump area (left of elevator upon exiting).**				
Procedure Note: • SFP volume ~ 470 gal/inch • FP/Tilt Pit volume ~ 575 gal/inch (Tilt Pit gate not sealed/not installed) • SFP/CLP volume ~ 535 gal/inch (CLP gate not sealed/not installed) • SFP/Tilt Pit/CLP volume ~ 640 gal/inch (Tilt Pit AND CLP gates not sealed/not installed) • Minimum RWT level for HPSI Pressurization System operation is 95%. • Normal SFP level is maintained between 401'4" and 401'6".				
(C)	1. (Step 11.2)	Secure Spent Fuel Pool Purification Pump (2P66). **POSITIVE CUE:** **Green light ON, red light OFF.**	Locally rotated 2P66 handswitch (2HS-5411) to STOP and released. Observed green light ON, red light OFF.	N/A SAT UNSAT
EXAMINER'S NOTE: **IF student misinterprets cue and performs step 11.3 vice 11.4, THEN task will still be accomplished (student will realign purification from SFP to RWT)**				
(C)	2. (Step 11.4)	Close Purification Loop to RWT (2FP-29). **POSITIVE CUE:** **2FP-29 pointer indicates closed.**	Rotated handwheel on 2FP-29 with chain operator CW to CLOSE.	N/A SAT UNSAT
TRANSITION NOTE: **Go to RAB elevation 354', Spent Fuel Pool Valve Gallery (left of elevator upon exiting).**				
(C)	3. (Step 11.4)	Open Purification Loop to Fuel Pool Isolation (2FP-17). **POSITIVE CUE:** **2FP-17 stem out, resistance**	Rotated handwheel on 2FP-17 CCW to OPEN.	N/A SAT UNSAT

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
		felt.		
(C)	4. (Step 11.4)	Verify open Purification Loop to Fuel Pool (2FP-18). **POSITIVE CUE:** **2FP-18 stem out, resistance felt**.	Rotated handwheel on 2FP-18 CW ≈ one turn then CCW to fully OPEN. OR At 2FP-18, examined valve position indicators to determine valve OPEN position.	N/A SAT UNSAT
TRANSITION: **Go to RAB elevation 335', Spent Fuel Pool Pump area (left of elevator upon exiting)..**				
EXAMINERS NOTE: **If radiological conditions do not allow access to the Purification Pump Room, have examinee describe the actions that would be taken.**				
(C)	5. (Step 11.5)	Close Purification Pump Discharge valve (2FP-10). **POSITIVE CUE:** **2FP-10 stem in, resistance felt.**	Rotated handwheel on 2FP-10 CW to CLOSE.	N/A SAT UNSAT
	6. (Step 11.6)	Verify 2P-66 Interlock Select Switch (2HS-5413) in NORMAL **POSITIVE CUE:** **2HS-5413 is in the NORMAL position.**	Visually verified that 2HS-5413 is in the left NORMAL position.	N/A SAT UNSAT
	7. (Step 11.7)	Establish communications with operator at SFP. **POSITIVE CUE:** **Operator acknowledges ready to monitor SFP level.**	Using plant telephones, radios, or the Gaitronics; contacted operator stationed at SFP.	N/A SAT UNSAT

Procedure Caution: A SFP Cooling/SFP Purification pipe chase is located at ~ 402' elevation at the SW corner of the SFP. If SFP is overfilled, contamination of SFP valve gallery (AB 354') and hall near 2F-3A/B (AB 335') can occur as a result of water flow through this pipe chase. If level is > 401' 7" and flow introduced, some overflow may occur due to wave motion of the water.				
(C)	8. (Step 11.8)	Start Spent Fuel Pool Purification Pump (2P66). **POSITIVE CUE:** **Red light ON, green light OFF.**	Locally rotated 2P66 handswitch (2HS-5411) to START and released. Observed red light ON, green light OFF.	N/A SAT UNSAT
EXAMINERS NOTE: **If radiological conditions do not allow access to the Purification Pump Room, have examinee describe the actions that would be taken.**				
Procedure Note: While throttling open 2FP-10 to establish flow, erratic oscillations typically occur due to air in the system. Allow oscillations to steady out and become minor (~5-10 psig) prior to opening 2FP-10 further.				
(C)	9. (Step 11.9)	Throttle open discharge valve 2FP-10. **POSITIVE CUES:** • **Flow noise is heard.** • **Suction and Discharge pump pressures are steady throughout.** • **2F4 and 2T5 ΔP's indicate flow.** • **Pump ΔP is 75 psid.** • **Suction and Discharge pump pressures are steady.**	Locally rotated 2FP-10 CCW as follows: • Until noise was heard. • Observed pump suction and discharge pressure steady while making small adjustments. • Observed ΔP across 2F-4 (2PDI-5406) and 2T5 (2PDI-5407) as indication of flow. • ΔP is within log limits (2PI-5409 minus 2PI-5410). • Observed suction pressure and discharge pressure not oscillating.	N/A SAT UNSAT
EXAMINER'S NOTE: **Provide the following cue:** **Operator at the SFP reports SFP at 401.5 feet.**				

(C)	10. (Step 11.10)	Stop Spent Fuel Pool Purification Pump (2P66). **POSITIVE CUE:** **Green light ON, red light OFF.**	Locally placed 2P66 handswitch (2HS-5411) to STOP and released. Observed green light ON, red light OFF.	N/A SAT UNSAT
END				

STOP TIME: _____

Examiner's Copy

JPM INITIAL TASK CONDITIONS

The following conditions exist:

- The Plant is shutdown and in Mode 6 with the core off loaded.
- 2K11-J5, FUEL POOL LEVEL LOW is in alarm.
- SFP level is 401.25 feet due to a leak on a SFP cooling pump packing gland which has been isolated
- SFP purification is aligned to the RWT
- An operator is stationed at the SFP to monitor level increase.
- Cask loading operations are NOT in progress.

INITIATING CUE:

Add water to the spent fuel pool (SFP) from the refueling water tank (RWT) using OP 2104.006, Section 11.0 to raise level to 401.5 feet.

Examinee's Copy

INITIAL CONDITIONS

The following conditions exist:

- The Plant is shutdown and in Mode 6 with the core off loaded.
- 2K11-J5, FUEL POOL LEVEL LOW is in alarm.
- SFP level is 401.25 feet due to a leak on a SFP cooling pump packing gland which has been isolated
- SFP purification is aligned to the RWT
- An operator is stationed at the SFP to monitor level increase.
- Cask loading operations are NOT in progress.

INITIATING CUE:

Add water to the spent fuel pool (SFP) from the refueling water tank (RWT) using OP 2104.006, Section 11.0 to raise level to 401.5 feet.

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **FUEL POOL SYSTEMS**	DOCUMENT NO. **2104.006**	CHANGE NO. **041**
	WORK PLAN EXP. DATE **N/A**	
SET #	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☒YES ☐NO	LEVEL OF USE ☒ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these *TRAPS*	**Get these *TOOLS***
Time Pressure	**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**	**054**

11.0 ALTERNATE FUEL POOL MAKEUP FROM THE RWT

NOTE

- SFP volume ~ 470 gal/inch
- FP/Tilt Pit volume ~ 575 gal/inch (Tilt Pit gate not sealed/not installed)
- SFP/CLP volume ~ 535 gal/inch (CLP gate not sealed/not installed)
- SFP/Tilt Pit/CLP volume ~ 640 gal/inch (Tilt Pit AND CLP gates not sealed/not installed)
- Minimum RWT level for HPSI Pressurization System operation is 95%.
- Normal SFP level is maintained between 401'4" and 401'6".

{4.3.2} 11.1 **IF Cask Loading Operations are in progress, THEN coordinate with Dry Fuel personnel prior to makeup.**

11.2 Verify Fuel Pool Purification pump (2P-66) secured (2HS-5411).

11.3 IF Purification aligned to SFP, THEN verify the following:

- Purification Loop Air Trap Outlet (2FP-7) closed.
- RWT Outlet to Fuel Pool and CVCS (2BS-6) open.
- RWT to Fuel Pool Isol (2FP-46) open.
- Borated MU or RWT to 2P-66 (2FP-32) open.
- RWT to 2P-66 (2BS-7) open.
- RWT Recirculation Isolation (2CV-5637-1) open.
- RWT Recirculation Isolation (2CV-5638-2) open.

11.4 IF Purification aligned to RWT, THEN verify the following:

- Purification Loop to RWT (2FP-29) closed.
- Purification Loop to Fuel Pool Isol (2FP-17) open.
- Purification Loop to Fuel Pool Isol (2FP-18) open.

11.5 Verify Purification Pump Discharge (2FP-10) closed.

11.6 Verify 2P-66 Interlock Select switch (2HS-5413) in NORMAL.

* 11.7 Station Operators as follows:

A. At SFP to continuously monitor Spent Fuel Pool Level (2LI-5414) until evolution complete.

B. At 2P-66 for pump operation until evolution complete.

C. Establish communications between Operators at SFP and 2P-66.

CAUTION

A SFP Cooling/SFP Purification pipe chase is located at ~ 402' elevation at the SW corner of the SFP. If SFP is overfilled, contamination of SFP valve gallery (AB 354') and hall near 2F-3A/B (AB 335') can occur as a result of water flow through this pipe chase. If level is > 401' 7" and flow introduced, some overflow may occur due to wave motion of the water.

11.8 Start 2P-66 using 2HS-5411.

NOTE

While throttling open 2FP-10 to establish flow, erratic oscillations typically occur due to air in the system. Allow oscillations to steady out and become minor (~5-10 psig) prior to opening 2FP-10 further.

11.9 Establish flow as follows:

11.9.1 Throttle open 2FP-10 until flow noise heard.

* 11.9.2 WHEN pump suction (2PI-5410) and discharge pressure (2PI-5409) oscillations not erratic
THEN continue making small open adjustments on 2FP-10.

11.9.3 Use ΔP across 2F-4 Purification Filters (2PDI-5408) and 2T-5 Demineralizer (2PDI-5407) as indication of flow until pressure gauge comes on scale.

11.9.4 WHEN the following parameters met,
THEN STOP throttling open 2FP-10:

- ΔP within Operations Log limit of 69.4 to 77.2 psid (2PI-5409 – 2PI-5410)
- Pump suction and discharge pressure oscillations minimal (normally < 1-2 psig)

11.10 WHEN Fuel Pool reaches desired level,
THEN stop Purification pump (2P-66) using 2HS-5411.

11.11 Secure Operators stationed for this evolution.

11.12 Align Purification system as desired using applicable section of this procedure.

Facility: ANO-2	Scenario No.: 1 (New)	Op-Test No.: 2011-1

Examiners:	Operators:

Initial Conditions:
100% MOL, All Engineered Safety Features systems are in standby. Gland Seal Steam Pressure Control Valve 2PCV-0231 jacked closed. RED Train Maintenance Week.

Turnover:
100% Power 250 EFPD. EOOS indicates 'Minimal Risk'. Gland Seal Steam Pressure Control Valve 2PCV-0231 is jacked closed; manually control seal steam pressure. RED Train Maintenance Week. Evolution scheduled: Fill the Quench Tank to ~76% IAW 2103.007 Quench Tank and Reactor Drain Tank Operations. Step 7.2.1 of 2103.007 for filling the quench tank is complete.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP) N (SRO)	Fill the Quench Tank.
2	CV0242	R (ATC) C (SRO)	#1 Main Turbine Generator Control Valve fails Closed. Tech Spec for SRO.
3	RCSLOCATCA	C (ATC) C (SRO)	Shutdown required due to 15 gpm Reactor Coolant system leak on 'A' cold leg. Tech Spec for SRO.
4	2C-11 AI_TIC_1602 MTGVIBINC	I (BOP) I (SRO)	Main Turbine Generator lube oil controller setpoint fails high. Main Turbine Generator Vibrations increase causing a reactor trip.
5	500LOSE500 500LOSE161	M (ALL)	Loss of Offsite Power causing natural circulation of the RCS.
6	FW2PW5BAFT	M(ALL)	'B' Main Feed water line breaks inside containment.
7	416 A308	C (BOP) C (SRO)	#1 EDG output breaker fails to automatically close.
8	CVC2P36LOLVL CVC2P36BSIAS CVC2P36CSIAS	I (ATC) I (SRO)	Backup Charging pumps fail to start on SIAS or Low PZR level. (Not credited for Malfunction after EOP entry due to possibly being discovered prior to EOP entry)
9	BS2P35BFAL BS2P35AFAULT K06-B01	C (BOP) C (SRO)	2P-35B Spray pump failed to automatically start and 2P-35A trips upon start.

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

Total malfunctions. = 8, Malfunctions after EOP entry = 2, Abnormal events = 3, Major transient = 2, EOPs with substantive actions =1, EOP Contingencies = 1, Critical tasks = 2.

Scenario #1 Objectives

1) Evaluate individual ability to operate reactor coolant auxiliary equipment.
2) Evaluate individual response to a failure of a Main Turbine Control valve.
3) Evaluate individual response to a small Reactor Coolant system leak.
4) Evaluate individual ability to perform a reduction in plant power.
5) Evaluate individual ability to respond to a failed controller.
6) Evaluate individual ability to respond to Degraded Electrical power.
7) Evaluate individual response to a failure of Emergency Diesel Generator output breaker to automatically close.
8) Evaluate individual ability to mitigate an Excess Steam Demand inside containment.
9) Evaluate individual response to a failure of automatic control of Pressurizer level control.
10) Evaluate individual ability to monitor operation of Engineered Safety Features equipment.

SCENARIO #1 NARRATIVE

Simulator session begins with the plant at 100% power steady state. Gland Seal Steam Pressure Control Valve, 2PCV-0231 is jacked closed.

When the crew has completed their control room walk down and brief, The BOP will fill the Quench Tank using the reactor makeup water system.

After the BOP has completed filling the Quench Tank to the appropriate level and cued by lead examiner; the #1 MTG control valve will fail closed. The SRO will enter AOP, 2203.024 Loss of Turbine Load. The SRO will direct the ATC to commence normal boration from a Boric Acid Makeup tank to lower reactor power until Tave and Tref are within 2 degrees. The SRO should call work management to investigate failure and may decide to fail #1 CV closed or have the BOP hold the test pushbutton for #1 CV which will maintain the valve closed.

When cued by the lead examiner, a 15 gpm RCS leak will start. The SRO will enter the excess RCS leakage AOP, OP 2203.016. ATC and BOP will perform RCS Leak rate determinations. The SRO will enter Tech Spec 3.4.6.2. The SRO will direct the ATC to maintain pressurizer level within 5% of set point by starting additional charging pumps as needed. The SRO will also direct the ATC to isolate letdown to determine the leak location. After the crew has determined the leak is not in letdown, they will restore letdown and the crew will change the boration method to commence a plant shutdown.

SCENARIO #1 NARRATIVE (continued)

After letdown has been restore to service and cued by the lead examiner, the Main Turbine Generator (MTG) lube oil temperature controller setpoint will fail high causing lube oil temperatures to raise. The SRO should refer to the high bearing temperature annunciator corrective action 2K02- B7 (alarm setpoint is 225ºF) and attempt to manually control lube oil temperature. If bearing temperature goes above 230 degrees Fahrenheit, the crew should manually trip the reactor. If bearing temperature does not go about 230 degrees Fahrenheit, then Turbine vibrations will begin to rise requiring a turbine and reactor trip.

The Crew will implement Standard Post Trip Actions (SPTA), OP 2202.001. When the Reactor trips a Loss of Offsite Power will occur. The output breaker for #1 EDG will not automatically close and the BOP should close the output breaker. The ATC will notice that the backup charging pumps did not start.

Also, when the reactor trips a Feedwater line break will start on the feedwater line to 'B' S/G due to a water hammer on the Feedwater line Check valve. The Crew will manually actuate Main Steam Isolation Signal (MSIS) or verify that a Main Steam Isolation signal automatically actuates. The Crew should secure and/or verify that Emergency Feedwater (EFW) is not feeding 'B' Steam generator. The ATC will secure two Reactor Coolant Pumps when RCS pressure goes below 1400 psia. The Containment Spray pump 2P-35B will fail to automatically start and Containment Spray pump 2P-35A will trip. The BOP will manual start 2P-35B to ensure containment design pressure is not exceeded.

The SRO will diagnose Functional Recovery due to two events in progress (Excess RCS leakage and Excess Steam demand) and enter OP 2202.009, Functional Recovery.
The crew will manually control Reactor Coolant Temperature once the 'B' SG boils dry using the upstream Atmospheric Dump Valve on 'A' SG. The ATC will control RCS pressure using auxiliary spray.

Simulator Instructions for Scenario 1

Reset simulator to MOL 100% power IC steady state.
Ensure that AACG is secured and annunciators clear.
Place MINIMAL RISK, Green Train Protected and RED Train Maintenance Week signs on 2C11.
'A' CCP lead charging pump. 'C' CCP aligned to green train.
2PCV-0231, Gland sealing steam pressure control valve failed closed.
Quench tank level ~72%, 2K10 E4 is in alarm.
T1, T2, T3, T4, T5, & T6 set to false.
T5 = Reactor trip
T6 = CSAS-2

Event No.	Malf. No.	Value/ Ramp Time	Event Description
1			Fill the Quench Tank.
2	SV0242 Trigger = T1	0	#1 Main Turbine Generator Control Valve fails Closed. Tech Spec for SRO.
3	RCSLOCATCA Trigger = T2	15	Shutdown required due to 15 gpm Reactor Coolant system leak on 'A' cold leg. Tech Spec for SRO.
4	2C-11 AI_TIC_1602 Trigger = T3 MTGVIBINC Trigger = T4	200 25 / 5 min.	Main Turbine Generator lube oil controller setpoint fails high. Main Turbine Generator Vibrations increase causing a reactor trip.
5	500LOSE500 500LOSE161 Trigger = T5	True True	Loss of Offsite Power causing natural circulation of the RCS.
6	FW2PW5BAFT Trigger = T5	2000/ 13 min.	'B' Main Feed water line breaks inside containment.
7	416 A308	NO_AUTO_CL	#1 EDG output breaker fails to automatically close.
8	CVC2P36LOLVL CVC2P36BSIAS CVC2P36CSIAS	True	Backup Charging pumps fail to start on SIAS or Low PZR level.
9	BS2P35BFAL BS2P35AFAULT K06-B01 Trigger = T6	True True / del 30 sec. ON / del. 31 sec.	2P-35B Spray pump failed to automatically start and 2P-35A trips upon start.

Simulator Operator CUEs		
At T=0		Fill the Quench Tank.
Cued by lead examiner	Trigger T1	#1 Main Turbine Generator Control Valve fails Closed. Tech Spec for SRO.
Cue: If requested as the WWM, then report that I&C will come to the Control Room to assist in failing #1 Main Turbine Generator Control valve closed. **Cue: When called as Chemistry, report that you will sample the RCS for Iodine at the time requested.**		
Cued by lead examiner	Trigger T2	Shutdown required due to 15 gpm Reactor Coolant system leak on 'A' cold leg. Tech Spec for SRO.
Cue: If requested, then report that seal water pump is running for requested charging pump. **Cue: if requested as WCO, then report running Charging pump post start checks are satisfactory.**		
Cued by lead examiner	Trigger T3	Main Turbine Generator lube oil controller setpoint fails high.
Cue: If contacted as the NLO for 2CV-1602 status, then report valve position based on the actual valve position and report flow noise is heard through the valve if it is open. **Cue: When contacted as the NLO, then report that Lube oil flows to bearing are normal but temperature are elevated (report temperatures based on actually simulator temperatures).**		
Cued by lead examiner	Trigger T4	Main Turbine Generator Vibrations increase.
Reactor trip	Trigger T5	Loss of Offsite Power causing natural circulation of the RCS.
Reactor trip	Trigger T5	'B' Main Feed water line break inside containment.
		Backup Charging pumps fail to start on SIAS or Low PZR level.
Cue: if requested as WCO, then report running Charging pump post start checks are satisfactory.		
Cued by CSAS	Trigger T6	2P-35B Spray pump failed to automatically start and 2P-35A trips upon start.
Cue: if requested as WCO, then report that 2P-35B Containment Spray pump post start checks are satisfactory.		

Op-Test No.: 2011-1	Scenario No.: 1	Event No.: 1
Event Description: Fill the Quench Tank using 2103.007 Quench Tank and Reactor Drain Tank Ops.		

Time	Position	Applicant's Actions or Behavior
	BOP	7.2 Raising Quench Tank level
	ANY	7.2.2 Close Rx Drain Tank Makeup Water Isol (2CV-4693).
	BOP	7.2.3 Open Containment Makeup Water Supply (2CV-4690-2).
	BOP	7.2.4 Throttle open Quench Tank Supply (2CV-4685).
	BOP	7.2.5 WHEN desired level is reached (maximum log level is 87%), THEN close the following valves: • 2CV-4685 • 2CV-4690-2
	BOP	7.2.6 Open Rx Drain Tank Makeup Water Isol (2CV-4693).
Termination criteria: When 2CV-4693 is open or at lead examiner's discretion.		

Op-Test No.: 2011-1 Scenario No.: 1 Event No.: 2

Event Description: #1 Main Turbine Generator (MTG) Control Valve fails Closed. Tech Spec for SRO.

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Report #1 MTG CV is failed Closed.
	SRO	Enter and direct actions of AOP 2203.024, Loss of Turbine Load. 1. Open Placekeeping page.
	SRO	2. Notify Control Board Operators to monitor floating steps.
	ATC	*3. Reduce Reactor power to match TAVE within 2°F of TREF using 2104.003 Exhibit 3, normal boration.
Exhibit 3 normal boration	ATC RAP	NORMAL RCS BORATION AT POWER PAGE 1 OF 2 1.0 Verify Boric Acid Makeup Flow controller (2FIC-4926) set as follows: • In MANUAL OR AUTO. • Setpoint set to desired flowrate. 2.0. Verify desired BAM pump (2P-39A OR 2P-39B) selected for automatic operation using BAM pump Select switch (2HS-4911-2). 3.0 Operate Mode Select Switch (2HS-4928) as follows: 3.1 Place to BORATE. 3.2 Verify the following: • Charging Pump Suction From Boric Acid (2CV-4930) opens. • Selected BAM pump (2P-39A OR 2P-39B) running. *4.0 IF additional boric acid flow required, THEN manually start additional BAM pump (2P-39A OR 2P-39B). *5.0 Verify BAM Tank Recirc Valve (2CV-4903-2 OR 2CV-4915-2) open for running pumps. 6.0 Operate Boric Acid Makeup Flow Batch controller (2FQIS-4926) as follows: 6.1 Depress Red pushbutton. 6.2 Verify 2FQIS-4926 set for desired quantity. 6.3 Verify 2FIC-4926 indicates desired flow rate.

Op-Test No.: 2011-1	Scenario No.: 1	Event No.: 2
Event Description: #1 Main Turbine Generator (MTG) Control Valve fails Closed. Tech Spec for SRO.		
Exhibit 3 normal boration	ATC	7.0 Monitor the following parameters: • RCS Tave • Axial Shape Index • Reactor power 8.0 IF desired to terminate boration, THEN reset 2FQIS-4926 to zero. 9.0 WHEN 2FQIS 4926 at zero, THEN verify the following: • Boric Acid Makeup Flow Control valve (2CV-4926) closes. • No flow indicated on 2FIC-4926. 10.0 Repeat steps 6.0 through 9.0 as required for boric acid addition. 11.0 WHEN desired to secure boric acid addition lineup, THEN perform the following: 11.1 Place 2HS-4928 to DILUTE. 11.2 IF BAM pump operation not required, THEN secure running BAM pump(s). 11.3 Close BAM tank Recirc valve(s) for secured pump(s). 11.4 Verify 2CV-4930 closed. 12.0 Verify 2FQIS-4926 Batch Volume placard updated to current batch volume.
	ANY	*4. Check RCS pressure 2025 to 2275 psia.
Cue: If asked, report that the MTG #1 CV indicates closed by local verification and If ask, report that the wires for the connector to the servo for # 1 CV are broken off and hanging to the side.		
	ANY	*5. Verify SDBCS maintaining SG pressure at setpoint.
	ANY	*8. Check RCS TC 542 to 554.7°F using CPC PID 5, 6, 160, or 161. **(not met perform contingencies)**
	SRO	*8. Refer to TS 3.2.6, Reactor Coolant Cold Leg Temperature. **Examiner note: The SRO must enter TS 3.2.6 or if boration has lowered temperature below the limit the SRO must log the TS 3.2.6 as been entered and exited.**
	ANY	*9. Check ASI within limits as specified in Core Operating Limits Report (COLR).

Op-Test No.: 2011-1	Scenario No.: 1	Event No.: 2
Event Description: #1 Main Turbine Generator (MTG) Control Valve fails Closed. Tech Spec for SRO.		
	ANY	*10. Check CEA positions as follows: A. ALL Regulating Group 6 CEAs above 112.5 inches. B. ALL Regulating Group 1 through 5 CEAs fully withdrawn. C. ALL Group P CEAs above 135 inches.
	ANY	*11. Check Reactor NOT tripped.
	ANY	*12. Verify Feedwater Control System restoring SG levels to setpoint.
	ANY	*13. Check PZR level within 5% of setpoint:
	ATC	13. Perform the following as needed: • Check auto operation of Charging and Letdown. • Take manual control of Charging and Letdown to restore PZR level to within 5% of setpoint. • IF PZR level >67%, THEN refer to TS 3.4.4
	ANY	15. Check Condenser pressure less than 5.3 inches Hg Abs.
	ANY	■16. Verify ALL required actions have been completed based on power level; refer to 2102.004, Power Operation.
	ANY	18. Notify Chemistry to sample RCS for Iodine 2 to 6 Hrs following Reactor power change greater than 15% in 1 Hr, refer to TS 4.4.8, RCS Activity.
Cue: When called as Chemistry, report that you will sample the RCS for Iodine at the time requested.		

Op-Test No.: 2011-1	Scenario No.: 1	Event No.: 2
Event Description: #1 Main Turbine Generator (MTG) Control Valve fails Closed. Tech Spec for SRO.		
	SRO	19. IF Main Turbine has NOT tripped, THEN perform the following: • Re-establish Turbine control on Load Limit Pot. • Refer to TRM 3.3.4.1, Turbine Overspeed Protection. • IF desired to fail a Turbine Control Valve closed, THEN refer to 2106.009, Turbine Generator Operations. Examiner note: The SRO may decide to pull up this step to fail a Turbine Control valve closed but it is not required to be performed.
Cue: If requested as the WWM, then report that I&C will come to the Control Room to assist in failing #1 Main Turbine Generator Control valve closed. **If requested, after 5 minutes have the communicator enter the simulator control room and perform as requested by the crew.**		
Termination criteria: When reactivity manipulations are satisfied or at the discretion of the lead examiner.		

Op-Test No.: 2011-1	Scenario No.: 1	Event No.: 3

Event Description: Shutdown required due to 15 gpm Reactor Coolant system leak on 'A' cold leg. Tech Spec for SRO.

Time	Position	Applicant's Actions or Behavior
Examiner Note: The RCS leak should not be triggered until RCS pressure is ~2200 psia due rising RCS pressure causing Reactor power to increase. RCS pressure will be increasing due to the plant response from the previous malfunction. Reactor power is rising due to the pressure co-efficient of reactivity.		
	ANY	Report any the following indications: • Containment dew point rising • Pressurizer Level lowing. • Letdown flow lowering.
	SRO	Perform the following actions: • Assess Critical parameters. • Determine RCS leak is present and enter Excess RCS Leakage AOP.
	SRO	Enter and direct the actions of AOP OP-2203.016, Excess RCS Leakage: 1. Open Placekeeping page.
	SRO	2. Notify Control Board Operators to monitor floating steps.
	ANY	*3. Determine RCS leakrate by ANY of the following: • Computer LKRT programs. • Check PZR level stable and use Charging and Letdown mismatch minus Controlled Bleed Off. • Check Letdown isolated and estimate RCS leak rate by total Charging flow minus Controlled Bleed Off. • CNTMT Sump level rate of rise. **Examiner note: The SRO may secure boration to assist in performing an RCS leak rate.**

Op-Test No.: 2011-1	Scenario No.: 1	Event No.: 3
Event Description: Shutdown required due to 15 gpm Reactor Coolant system leak on 'A' cold leg. Tech Spec for SRO.		
	ATC	*4. Maintain PZR level within 5% of setpoint by performing the following as necessary: A. Cycle Charging pumps. B. Isolate Letdown as follows: 1) Verify at least ONE Letdown Isolation valve closed: • 2CV-4820-2 • 2CV-4821-1 • 2CV-4823-2 (least preferred) 2) Record Charging Header Data in 2202.010 Attachment 44, Charging Header Data. **Examiner note: The ATC may discover that at least one back up charging pump is not going to start based on PZR level during the excess RCS leak. Typically the SRO will give a more restrictive PZR level band of within 3% of setpoint and the ATC may not determine that the backup charging pumps will not start based on PZR level. See event #8**
Cue: If requested, then report that seal water pump is running for requested charging pump. **Cue: if requested as WCO, then report running Charging pump post start checks are satisfactory.**		
	ATC	*5. Check PZR level maintained within 10% of setpoint.
	ATC	*7. Maintain VCT level 60% to 75%; refer to 2104.003, Chemical Addition.
	SRO	*10. Refer to 1903.010, Emergency Action Level Classification. **Examiner note: The SRO will direct the SM to refer to EALs.**
		*11. IF location of leak known, THEN perform the applicable following steps (12.A through 12.J): CNTMT step 12.A

Op-Test No.: 2011-1	Scenario No.: 1	Event No.: 3
Event Description: Shutdown required due to 15 gpm Reactor Coolant system leak on 'A' cold leg. Tech Spec for SRO.		
	SRO	If this step entered from step 11, then only perform substep for identified leak path. *12. IF location of leak unknown, THEN locate and isolate leak as follows: A. Perform the following: 1) IF leakage is within allowable limits of TS 3.4.6.2, THEN, Attempt to locate leak in CNTMT by monitoring CAMS suction points and CNTMT Area Radiation monitors. **Examiner note: 15 gpm is not within the allowable limits of TS 3.4.6.2.**
	ATC	2) Verify leak NOT in Letdown line inside CNTMT by performing the following: a) Isolate Letdown by verifying at least ONE Letdown Isolation valve closed: • 2CV-4820-2 • 2CV-4821-1 • 2CV-4823-2 (least preferred) b) IF RCS leakage NOT stopped, THEN letdown may be restored at discretion of SM using 2104.002, Chemical and Volume Control. **Examiners Note: Isolating Letdown will not isolate the leak and Letdown should be restored to service.**
Cue: If contacted as RP, respond by reporting that RP will monitor dose rates		
Steps for Letdown Restoration	ANY	9.2 Restoring Letdown Flow (After Temporary Isolation) 9.2.1 Perform the following notifications: • Notify Radiation Protection of changing Letdown alignment. (CR-ANO-2-2002-00249) 9.2.2 Verify Letdown Flow controller (2HIC-4817) in MANUAL. 9.2.3 Using Letdown Flow controller (2HIC-4817) verify Letdown Flow Control valves closed: • 2CV-4816 • 2CV-4817

Op-Test No.: 2011-1		Scenario No.: 1	Event No.: 3
Event Description: Shutdown required due to 15 gpm Reactor Coolant system leak on 'A' cold leg. Tech Spec for SRO.			
Steps for Letdown Restoration	ANY	9.2.4 Verify Letdown Pressure controller (2PIC-4812) in MANUAL. 9.2.5 Verify 2HS-4812 selected to desired valve(s) to be placed in service: • 2CV-4810 • 2CV-4811 • BOTH 9.2.6 Verify selected (2HS-4812) valve(s) 2CV-4810/2CV-4811 fully open using 2PIC-4812. 9.2.7 Verify Letdown isolation 2CV-4820-2 (2HS-4820-2) open. 9.2.8 Verify Regen Hx inlet 2CV-4821-1 (2HS-4821-1) open. 9.2.9 Verify Letdown Regen Hx Outlet valve 2CV-4823-2 (2HS-4823-2) open. 9.2.10 Verify LD/DI 2T-36A/B, 2T-70 Inlet/Bypass (2CV-4803) hand switch (2HS-4803)in AUTO/ION EXCH: 9.2.11 Verify 2F-3A/B Inlet Isolation (2CVC-139) fully open. 9.2.12 Verify CCP running (2FIS-4863). 9.2.13 Verify 2HS-4817 selected to desired valve(s) to be placed in service: • 2CV-4816 • 2CV-4817 • BOTH 9.2.14 Using Letdown Flow controller (2HIC-4817) slowly open 2CV-4816/2CV-4817 to initiate flow. 9.2.15 Using Letdown Pressure controller (2PIC-4812) slowly close 2CV-4810/2CV-4811 to establish desired pressure: • IF RCS pressure < 450 psia, THEN maintain L/D backpressure (2PIC-4812) above saturation for letdown temperature (2TI-4820). • IF RCS pressure > 450 psia, THEN maintain L/D backpressure (2PIC-4812) at setpoint (normal setpoint is 350 psig).	

Op-Test No.: 2011-1	Scenario No.: 1	Event No.: 3
Event Description: Shutdown required due to 15 gpm Reactor Coolant system leak on 'A' cold leg. Tech Spec for SRO.		
Steps for Letdown Restoration	ANY	9.2.16 WHEN letdown pressure at desired setpoint, THEN Letdown Pressure controller (2PIC-4812) may be placed in AUTO. 9.2.17 Using Letdown Flow controller (2HIC-4817) manually adjust 2CV-4816/2CV-4817 position to maintain desired pressurizer level. 9.2.18 Check 2PIC-4812 maintained at setpoint. 9.2.19 Establish 0.5 to 1.5 gpm flow through Rad Monitor Flow Indicator (2FIS-4807) per Letdown Line Radiation Monitor Flow Control section of this procedure.
	SRO	*13. Check leakage within allowable limits; refer to TS 3.4.6.2, Reactor Coolant System Leakage. **Examiners Note: SRO must enter Tech Spec 3.4.6.2 action b.**
	ALL	*13. Perform the following: A. Continue efforts to locate and isolate leak. B. IF plant shutdown required, THEN perform EITHER of the following using 2102.004, Power Operations: 1) IF leakage greater than 10 gpm, THEN perform RCS boration using 2104.003, Chemical Addition, Attachment R, RCS Boration from the RWT or BAMT. 2) IF RCS leakage less than 10 gpm, THEN perform RCS boration using 2104.003, Chemical Addition, Exhibit 3, Normal RCS Boration at Power. **Examiners Note: The ATC should start a shutdown using 2104.003, Chemical Addition, Attachment R. The ATC may already be borating using Exhibit 3 but must change the boration method due to the leakrate value. This does not have to be accomplished prior to moving to the next event.**

Op-Test No.: 2011-1 Scenario No.: 1 Event No.: 3

Event Description: Shutdown required due to 15 gpm Reactor Coolant system leak on 'A' cold leg. Tech Spec for SRO.

Steps for Boration from the RWT or BAMT	ATC	ATTACHMENT R PAGE 1 OF 3 RCS BORATION FROM THE RWT OR BAMT 1.0 Verify RCS Makeup aligned to CCP Suction. 2.0 Perform one of the following to ensure VCT level does not rise above auto-divert setpoint: 2.1 Verify VCT level at 60-62% (to allow for CBO flow while VCT isolated) using "Manual Divert Operations" section of Chemical and Volume Control (2104.002). 2.2 Verify flag in place (e.g. PMS/PDS/SPDS alarm) to alert operator to condition of VCT level approaching auto-divert setpoint. *2.2.1 Cycle VCT Inlet/Divert Valve to BMS 2CV-4826 (2HS-4826) to maintain VCT level at desired value as follows: A. Align VCT Inlet/Divert Valve to BMS 2CV-4826 (2HS-4826) to divert by placing 2HS-4826 to BMS position. B. WHEN desired VCT level reached, THEN align 2CV-4826 to VCT by placing 2HS-4826 to AUTO position. 3.0 Determine desired boration rate and dilution flow from Reactivity Plans located in Plant Data Book or manual calculation. 4.0 Perform the following to align for dilution: 4.1 Verify Boric Acid Makeup Flow controller (2FIC-4926) set as follows: 4.1.1 Verify 2FIC-4926 in Manual. 4.1.2 Verify 2FIC-4926 demand set to minimum. 4.2 Verify at least ONE Reactor Makeup Water pump running (2P-109A/B): • 2P-109A (2HS-4965) • 2P-109B (2HS-4966)

Op-Test No.: 2011-1	Scenario No.: 1	Event No.: 3

Event Description: Shutdown required due to 15 gpm Reactor Coolant system leak on 'A' cold leg. Tech Spec for SRO.

Steps for Boration from the RWT or BAMT	ATC RAP RAP	4.3 Verify Reactor Makeup Water Flow controller (2FIC-4927) set as follows: 4.3.1 Setpoint set to dilution flow rate determined above. 4.3.2 IF controller in MANUAL, THEN controller demand set to desired value. 4.4 Open VCT Makeup Isolation 2CV-4941-2 (2HS-4941-2). 5.0 Open one of the following valves from a boric acid source: • Charging Pump Suction from RWT 2CV-4950-2 (2HS-4950-2) • BAMT (2T-6A) Gravity Feed 2CV-4920-1 (2HS-4920-1) • BAMT (2T-6B) Gravity Feed 2CV-4921-1 (2HS-4921-1) 6.0 Close VCT Outlet 2CV-4873-1 (2HS-4873-1). 7.0 IF Letdown in service, THEN place Divert valve 2CV-4826 (2HS-4826) to BMS position. 8.0 Perform the following to start dilution flow: 8.1 Place Mode Select switch (2HS-4928) in Manual. 8.2 Verify 2FIC-4926 indicates zero. *8.3 Verify 2FIC-4927 indicates desired flow rate. 8.4 Verify BAM Tank Recirc 2CV-4903-2 (2HS-4903-2) /2CV-4915-2 (2HS-4919-2) open for running pumps. * 9.0 Perform ANY of the following to adjust boration rate as needed: • Start and Stop additional charging pumps. Refer to Chemical and Volume Control (2104.002). • Adjust Reactor Makeup Water Flow controller (2FIC-4927) demand. • Shift suction sources between RWT and BAMT.

Termination criteria: When letdown has been isolated and verified the RCS leak is still on going, or Letdown is restored, or at lead examiner's discretion.

Op-Test No.: 2011-1	Scenario No.: 1	Event No.: 4
Event Description: Main Turbine Generator lube oil controller setpoint fails high. Main Turbine Generator Vibrations increase.		

Time	Position	Applicant's Actions or Behavior
Examiner Note: It takes approximately 8 min. from the time the malfunction is insert until 2K02-B7 will alarm. The malfunction should be trigger early to allow time for the temperature to trend up.		
Cued by examiner	ANY	Determine that Turbine Lube oil temperature is rising.
	ANY	IF 2K02-B7 TURB BRNG TEMP HI comes in alarm then announce the alarm.
	SRO	IF 2K02-B7 TURB BRNG TEMP HI comes in alarm then implements actions of the Turbine bearing temp high alarm.
	ANY	2.1 Monitor bearing temperatures on 2TRS-0211 and Plant computer.
	BOP	2.2 Verify Lube Oil 2E-15A/B Temperature controller (2TIC-1602) set to control temperature at 115°F. **Examiner note: The SRO should direct manual control of 2TIC-1602 Lube Oil temperature controller.**
Cue: If contacted as the NLO for 2CV-1602 status, then report valve position based on the actual valve position and report flow noise is heard through the valve if it is open.		
	SRO	2.4 IF bearing metal temperature reaches 230°F OR Bearing Oil Pressure Low in alarm (2K02-A7), THEN perform the following: 2.4.1 IF Reactor power greater than SDBCS capacity, THEN trip Reactor.
Examiner Note: Depending on how soon that manual control is taken for turbine lube oil cooling, the crew may have to trip the reactor based on bearing metal temperatures. If they do not have to trip the reactor, then the malfunction for turbine vibrations should be triggered.		
	ANY	Direct NLOs to perform the following: 2.6 Check lube oil flow and temperature at affected bearings.
Cue: If contacted as the NLO, then report that Lube oil flows to bearings are normal but temperatures are elevated (report temperatures based on actual simulator temperatures).		
	ANY	Contact work management to repair 2TIC-1602.
	ANY	Report Turbine Vibrations trending higher.
	SRO	The SRO may take conservative action to trip the turbine and reactor if vibrations are noted to be trending higher.
	ANY	Report Turbine Bearing Vibration Hi alarm
	BOP	Report Turbine Tripped.
	SRO	Direct Reactor trip due to the turbine trip.
Termination Criteria: 2TIC-1602 in manual and controlling lube oil temperatures, or crew tripped the reactor due to elevated bearing temperatures, or at lead examiner's discretion.		

Op-Test No.: 1	Scenario No.: 1	Event No.: 5, 6 & 7

Event Description: Loss of Offsite Power causing natural circulation of the RCS. 'B' Main Feed water line break inside containment. #1 EDG output breaker fails to automatically close.

Time	Position	Applicant's Actions or Behavior
	ANY	Report Reactor Tripped.
	SRO	Enter and implement EOP 2202.001, Standard Post Trip Actions.
	SRO	1. Notify Control Board Operators to monitor safety functions using Exhibit 7, CBO Reactor Trip Checklist. 2. Open Safety Function Tracking page.
	ANY	Close MSIVs due to LOOP and an unisolated flow path from Main steam to the condenser. **Examiner Note: The SRO will probably pull up the step to close MSIVs from RCS heat removal due to the known flow path.**
Reactivity control safety function	ATC	3. Check Reactivity Control established as follows: A. Reactor power lowering. B. ALL CEAs fully inserted. **(The CEAs will be fully inserted and can be verified by CEAC indications)**
Vital Auxiliaries safety function	BOP	4. Check Maintenance of Vital Auxiliaries satisfied: A. Main Turbine tripped. B. Generator Output breakers open. C. Exciter Field breaker open. D. At least ONE 6900v AC bus energized. **(Not met)** E. At least ONE 4160v Non-vital AC bus energized. **(Not met)** F. BOTH 4160v Vital AC buses energized. **(2A-4 Vital bus will be energized but 2A-3 will not be energized perform contingency)** G. BOTH DGs secured. (**Both DGs will be running, Service water will be aligned to #2 EDG and after #1 EDG output breaker is closed service water will be aligned.)** H. At least ONE 125v Vital DC bus energized: 2D01 - SPDS point E2D01 2D02 - SPDS point E2D02

Op-Test No.: 1	Scenario No.: 1	Event No.: 5, 6 & 7
Event Description: Loss of Offsite Power causing natural circulation of the RCS. 'B' Main Feed water line break inside containment. #1 EDG output breaker fails to automatically close.		

Time	Position	Applicant's Actions or Behavior
Vital Auxiliaries safety function	BOP	Vital Auxiliaries Contingency for 4160 Vital bus F. Perform the following: 1) IF de-energized 4160v Vital AC bus available AND associated EDG available, THEN verify associated EDG supplying bus.
RCS Inventory Control Safety function	ATC	5. Check RCS Inventory Control established as follows: A. PZR level: • 10 to 80%. • Trending to setpoint. **(May not be met due to ESD Event #6 or Charging pump auto start failure event #8 perform contingency if not met)** B. RCS MTS 30°F or greater.
	SRO	**Examiners Note: This may or may not be performed depending on the PZR level trend at the time this safety function is assessed.** Direct the following as necessary: A. Perform as necessary: 1) IF SIAS actuated on PPS inserts, THEN **GO TO** Step 6. 2) Verify PZR Level Control system restoring level to setpoint.
RCS Pressure Control Safety function	ATC	6. Check RCS Pressure Control: —— • 1800 to 2250 psia. —— • Trending to setpoint. **(May not be met due to ESD Event #6. Perform contingency if not met)**

Op-Test No.: 1	Scenario No.: 1	Event No.: 5, 6 & 7

Event Description: Loss of Offsite Power causing natural circulation of the RCS. 'B' Main Feed water line break inside containment. #1 EDG output breaker fails to automatically close.

Time	Position	Applicant's Actions or Behavior
RCS Pressure Control Safety function	SRO	**Examiners Note: This may or may not be performed depending on the Pressurizer level trend at the time this safety function is assessed.** Direct the following actions as necessary: 6. Perform as necessary: D. IF RCP 2P32A or 2P32B stopped, THEN verify associated PZR Spray valve in MANUAL and closed. **(Should be performed if RCPs are secured.)** E. IF RCS pressure lowers to 1650 psia or less, THEN perform the following: 1) Verify SIAS actuated on PPS inserts. 2) **GO TO** Step 7.
Core Heat Removal safety function.	ATC	7. Check Core Heat Removal by forced circulation: A. At least ONE RCP running. **(RCPs will be secured due LOOP and CRS should perform the contingency)**
	SRO	If required, direct the contingency for step 7. E
	ATC	A. IF ALL RCPs stopped, THEN perform the following: 1) Verify BOTH PZR Spray valves in MANUAL and closed. 2) GO TO Step 8.

Op-Test No.: 1 Scenario No.: 1 Event No.: 5, 6 & 7

Event Description: Loss of Offsite Power causing natural circulation of the RCS. 'B' Main Feed water line break inside containment. #1 EDG output breaker fails to automatically close.

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal Safety Function	ANY	8. Check RCS Heat Removal: A. Check SG available by BOTH of the following: • At least ONE SG level 10 to 90%. • FW maintaining SG level. **(Not met due to Feed line break, perform contingency if necessary)** B. Check MFW in RTO. **(Not met due to Feed line break, perform contingency if necessary)** C. Check Feedwater line intact by the following: **(Not met but these conditions can not be assessed due to plant configuration)** • SG level stable or rising. • NO unexplained step changes or erratic FW flow. • NO unexplained step changes or erratic Condensate flow. D. Check Condensate Pump discharge header pressure < 753 psig. E. Check SG pressure 950 to 1050 psia. **(Not be met, perform contingency if necessary)** F. Check RCS TC 540 to 555°F.
	ANY	Perform step 8 contingency actions that are applicable: A. Perform the following: 1) IF SG level lowering, THEN verify EFAS actuated. **(If the feed line break has been discover then, EFAS should be actuated to the 'A' S/G only)**
	ANY	B. Verify EITHER of the following: • BOTH MFW pumps tripped. • SG levels controlling at setpoint

Op-Test No.: 1	Scenario No.: 1	Event No.: 5, 6 & 7
Event Description: Loss of Offsite Power causing natural circulation of the RCS. 'B' Main Feed water line break inside containment. #1 EDG output breaker fails to automatically close.		

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal Safety Function	ANY	E. Perform as necessary: 1) IF SG pressure 751 psia or less, THEN perform the following: a) Verify MSIS actuated on PPS inserts. b) Maintain RCS post-cooldown conditions as follows: • Maintain RCS pressure within P-T limits with PZR heaters and spray using Attachment 27, PZR Spray Operation. • Maintain RCS temperature by steaming intact SG using Upstream ADV or Upstream ADV Isolation MOV. c) **GO TO** Step 9.

Op-Test No.: 1 Scenario No.: 1 Event No.: 5, 6 & 7

Event Description: Loss of Offsite Power causing natural circulation of the RCS. 'B' Main Feed water line break inside containment. #1 EDG output breaker fails to automatically close.

Time	Position	Applicant's Actions or Behavior
Containment Safety Function	ANY	9. Check CNTMT parameters: A. Temperature and Pressure: **(Not be met due to ESD Event #6. Perform contingency)** • Temperature less than 140°F. • Pressure less than 16 psia. B. Check CNTMT Spray pumps secured. **(Not met, contingency satisfied)** C. NO CNTMT radiation alarms or unexplained rise in activity: 1) CAMS alarms: • "CNTMT PART/GAS RAD HI/LO" annunciator (2K10-B6) clear. 2) RCS leakage alarms: • "AREA RADIATION HI/LO" annunciator (2K11-B10) clear. • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. 3) Check the following radiation monitors trend stable: • CNTMT Area • CAMS • Process Liquid D. NO secondary system radiation alarms or unexplained rise in activity: 1) "SEC SYS RADIATION HI" annunciator (2K11-A10) clear. 2) Secondary Systems Radiation monitors trend stable: • Main Steam lines • SG Sample • Condenser Off Gas

Op-Test No.: 1	Scenario No.: 1	Event No.: 5, 6 & 7

Event Description: Loss of Offsite Power causing natural circulation of the RCS. 'B' Main Feed water line break inside containment. #1 EDG output breaker fails to automatically close.

Time	Position	Applicant's Actions or Behavior
	ANY	Contingency for Containment parameters not being met. A. Perform the following: 2) IF CNTMT pressure 18.3 psia or greater, THEN verify the following: • CIAS, CCAS, and SIAS actuated on PPS inserts. • At least ONE Emergency Penetration Room Vent Fan running. • CNTMT Cooling fans running in Emergency Mode.
	ANY	3) IF CNTMT pressure 23.3 psia or greater, THEN verify the following: • CSAS actuated on PPS inserts. • Spray flow greater than 1875 gpm per header. • ALL RCPs stopped AND BOTH PZR Spray valves in MANUAL and closed. **Examiner note: See Event #9**
	SRO	10. Notify STA to report to control room. 11. Verify NLOs informed of Reactor trip. 12. Verify Reactor trip announced on Plant page. 13. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
	SRO	14. Direct control board operators to acknowledge ALL annunciators and announce ALL significant alarms.
	SRO	15. Check ALL safety function acceptance criteria satisfied. **(All safety functions are not satisfied, perform contingency)** 15. IF ANY safety function acceptance criteria NOT satisfied, THEN perform the following: A. Notify control room staff of safety functions NOT satisfied. B. GO TO Exhibit 8, Diagnostic Actions.
	SRO	Diagnose Functional Recovery EOP 2202.009.
	SRO	Enter and implement Functional Recovery EOP 2202.009.

Op-Test No.: 1 Scenario No.: 1 Event No.: 5, 6 & 7

Event Description: Loss of Offsite Power causing natural circulation of the RCS. 'B' Main Feed water line break inside containment. #1 EDG output breaker fails to automatically close.

Time	Position	Applicant's Actions or Behavior
	SRO	2. Record present time: • Time _____.
	SRO	* 3. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
	ANY	* 4. Check RCS pressure greater than 1400 psia.
Examiner Note: **The SRO should have directed the ATC and BOP actions for maintaining post-cooldown conditions from SPTAs and therefore may not implement the following floating step.**		
	SRO	The SRO should pull up the floating step for maintaining post-cooldown conditions if not directed from SPTAs. HR-2 Step 33.
	BOP	■33. Maintain RCS post-cooldown conditions as follows: A. Maintain RCS temperature by steaming intact SG using EITHER of the following: • Upstream ADV. • Upstream ADV Isolation MOV.
Maintain post-cooldown conditions **CRITICAL TASK**	ATC	B. Maintain RCS pressure within P-T limits using PZR heaters and 2202.010 Attachment 27, PZR Spray Operation. **Post steam generator blow down, use attachment 27 to maintain RCS pressure within the Pressure-Temperature limits of 200°F and 30°F Margin to Saturation.**
Examiner Note: The SRO should complete the safety functions in order of hierarchy that are challenged first, and then the satisfied safety functions.		
Examiner Note: The SRO may discuss Tech Spec 3.4.1.2 RCS loops and 3.4.9.1 RCS cooldown limits to due the excess steam demand event.		
Termination criteria: When post-cooldown conditions have been stabilized and safety functions prioritized or at examiner's discretion.		

Op-Test No.: 2011-1 Scenario No.: 1 Event No.: 8

Event Description: Backup Charging pump fail to start on SIAS or Low PZR level.

Time	Position	Applicant's Actions or Behavior
	ANY	Recognize the Backup Charging pumps failed to automatically start.
	SRO	Direct the ATC to manually start the Backup charging pumps during the ESD event using OP-2202.010 Standard Attachment, Exhibit 9.
	ATC	Perform the following to start backup charging pumps: 3.0 IF SIAS, THEN verify the following: ☐ Available Charging Pumps in service with proper discharge pressure and flow. **Examiner note: Charging pumps may be secured after the ESD event to maintain PZR level in the desired control band.**
Examiner note: The ATC may discover the failure of the backup charging pumps during the Loss of Turbine load AOP, excess RCS leakage AOP, or post reactor trip. The actions should be to start the back up charging pumps IAW with the procedure in use. See Loss of Turbine load and Excess RCS leakage charging steps below.		
Examiner note: Loss of Turbine Load AOP steps for charging control		
	ANY	*13. Check PZR level within 5% of setpoint:
	ATC	13. Perform the following as needed: • Check auto operation of Charging and Letdown. • Take manual control of Charging and Letdown to restore PZR level to within 5% of setpoint. • IF PZR level >67%, THEN refer to TS 3.4.4
Examiner note: Excess RCS leakage AOP steps for charging control		
	ATC	*4. Maintain PZR level within 5% of setpoint by performing the following as necessary: A. Cycle Charging pumps.
Termination criteria: Charging pumps controlled as needed to maintain pressurizer level within given bands or at examiner's discretion.		

Op-Test No.: 2011-1 Scenario No.: 1 Event No.: 9

Event Description: 2P-35B Spray pump failed to automatically start and 2P-35A trips upon start.

Time	Position	Applicant's Actions or Behavior
	ANY	Recognize the 2P-35B has failed to auto start.
	ANY	Recognize the 2P-35A has tripped after start.
	SRO	Direct BOP to verify Green Train Containment Spray pump running and CSAS actuated IAW 2202.010 Exhibit 9.
CRITICAL TASK	BOP	4.0 IF CSAS, THEN verify the following: ☐ CSS Pump 2P35B in service with proper discharge pressure and flow. ☐ CSS Header Isolation (2CV-5613-2) open. **Examiner Note: 2P-35B should be started prior to containment exceeding the design pressure of 59 psig or 73.7 psia.**
Cue: if requested as WCO, then report that 2P-35B Containment Spray pump post start checks are satisfactory.		
Termination criteria: 2P-35B Containment Spray Pump running or at examiner's discretion.		

Facility: ANO-2	Scenario No.: 3 (New)	Op-Test No.: 2011-1

Examiners:	Operators:

Initial Conditions:
60% MOL, All Engineered Safety Features systems are in standby. Gland Seal Steam Pressure Control Valve 2PCV-0231 jacked closed. RED Train Maintenance Week.

Turnover: 60% power for repair of 2P-1B Feedwater pump. 250 EFPD. EOOS indicates 'Minimal Risk'. Gland Seal Steam Pressure Control Valve 2PCV-0231 jacked closed, manually control seal steam pressure. RED Train Maintenance Week. 'B' Main Feedwater pump PMT is complete and is idling for oxygen control. Evolution scheduled: Place 'B' Main Feedwater pump in service and raise power to 100%. Step 10.1 of 2106.007, Main Feedwater pump and FWCS operation, for placing the 'B' Main Feedwater pump in service is complete. Commence power escalation using applicable 2104.002 steps 9.1 through 9.11 are complete and steps 9.13 to 9.18 and 9.20 to 9.30 are not applicable or complete with the exception of placing 'B' Main feedwater pump in service (step 9.25). **(provide markup copy of Power OPS procedure 2104.002 Section 9)**

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP) N (SRO)	Place 'B' MFWP in service.
2		R (ATC) N (SRO)	Power Ascension.
3	XRC2TE46111	I (BOP) I (SRO)	Tc temperature transmitter fails high. Tech Spec for SRO.
4	CVC4817DEM	I (ATC) I (SRO)	Letdown Hand Indicating Controller (HIC) demand fails high causing low pressurizer level.
5	XRCCHBPLVL	I (ATC) I (SRO)	Channel 'B' Pressurizer level channel fails low. Tech Spec for SRO.
6	EHSYSLEAK	M (ALL)	Leak in the Electro Hydraulic system causing a turbine trip, reactor trip and a loss of main feedwater pumps.
7	XMSHDRPRS	I (BOP) I(SRO)	SDBCS input fails low after the Reactor trip.
8	CV0332 EFW2P7BFLT	C (BOP) C (SRO)	2P-7A Emergency Feedwater pump overspeed trips on start and 2P-7B motor trips due to a winding failure.

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

Total malfunctions. = 6, Malfunctions after EOP entry = 2, Abnormal events = 3, Major transient = 1,
EOPs with substantive actions =1, EOP Contingencies = 0, Critical tasks = 2.

Scenario #3 Objectives

1) Evaluate individual ability to place a Main Feedwater pump in service.
2) Evaluate individual ability to perform a power escalation.
3) Evaluate individual response to a RCS temperature instrument failure.
4) Evaluate individual response to a failure of a Hand indicating controller failure.
5) Evaluate individual response to a failure of a Pressurizer level control channel.
6) Evaluate individual response to an Electro Hydraulic system leak.
7) Evaluate individual response to a failure of the Steam Dump Bypass control system to function in automatic.
8) Evaluate individual ability to mitigate a Loss of Feedwater event.
9) Evaluate individual ability to monitor operation of Engineered Safety Features equipment.

SCENARIO #3 NARRATIVE

Simulator session begins with the plant at 60% power steady state Gland Seal Regulator, 2PCV-0231 is jacked closed.

When the crew has completed their control room walk down and brief, The BOP will place the 2P-1B feedwater pump in service. Also, while the BOP is placing 2P-1B feedwater pump in service the ATC will raise reactor power using RCS dilution.

After the BOP has placed the 'B' feedwater pump in service and the ATC has completed the required reactivity manipulation and cued by lead examiner, 2TE-4611-1(2TI-4605-1) RCS temperature transmitter will fail high. The ATC/BOP will announce Trip and Pretrip alarms on 'A' PPS channel. The SRO will refer to the ACA for RPS Pretrip-Trip alarms and Technical Specifications. Then the SRO will direct that points on 'A' channel PPS for LPD, and DNBR must be bypassed in 1 hour as required by Tech Specs.

After the 'A' channel PPS points have been bypassed and cued by lead examiner, the demand on the Letdown Hand Indicating controller (HIC) will ramp to 100%. This will result in letdown going to maximum flow. The elevated letdown flow will cause pressurizer level to lower and the volume control tank level to trend up until the automatic setpoint is reached to divert the excess letdown flow to the online holdup tank. Eventually, a backup charging pump will start based on low pressurizer level causing the low oil pressure alarm to come in and then clear. The ATC and SRO should diagnose that the letdown controller demand does not match the demand from the pressurizer level controller. The ATC will take the letdown flow controller to manual and control PZR level.

After letdown has been placed in manual and pressurizer level is being restored to set point by manual control and cued by the lead examiner, the 'B' channel pressurizer level instrument will fail low. This will cause the backup charging pumps to automatically start and will de-energize all pressurizer heaters. AOP 2203.028, PZR Systems Malfunctions, will be entered and actions directed by the SRO. The ATC will verify that the other level control channel is reading correctly and select that channel for control and place the PZR low level cutoff switch to the unaffected channel. The ATC will also restore the pressurizer proportional heaters to service. The SRO will enter Tech Spec 3.3.3.5 Remote Shutdown instrumentation and 3.3.3.6 Post Accident Instrumentation.

SCENARIO #3 NARRATIVE (continued)

After the ATC has placed 'A' Channel pressurizer level control in service and restored pressurizer proportional heaters, an EH leak will start down stream of isolation valve 2EH-1A (on EH Pump Skid) on the common header. EH pressure will degrade to ~1300 psig over the next 3 minutes. Annunciator 2K02-A9, LOW EH Pressure, will alarm and the standby EH pump will automatically start. EH pressure will rise and then lower again as the leak degrades. Annunciator 2K02-C10, EH Tank Low Level will alarm about 5 minutes after the start of the malfunction. The Main Turbine Generator will automatically trip at 1100 psig EH pressure. The Main Feed Pumps will automatically trip at 400 psig EH pressure. The crew will secure the EH pumps and the CRS will enter SPTA's.

The Crew will implement Standard Post Trip Actions (SPTA), OP 2202.001. When the reactor trips, the input to the Steam Dump Bypass Control System (SDBCS) will fail low. This will cause the SDBCS valves to have no demand and remain closed. The crew should take manual control of the SDBCS valves to control S/G pressure. 2P-7B Emergency Feedwater pump will trip when it starts due to a motor fault. During SPTAs, 2P-7A will overspeed trip due to an oil leak. The ATC will secure two Reactor Coolant Pumps (RCP) during SPTAs based on no available feedwater and the BOP will close the Steam Generator blowdown valves. If the SRO directs all RCPs secured during SPTAs, the ATC will align for Auxiliary spray to control RCS pressure.

The SRO will diagnose Loss of Feedwater due no feedwater feeding the Steam Generators and enter OP 2202.006, Loss of Feedwater.
The crew will secure all RCPs if not secured during SPTAs. The ATC will align for Auxiliary spray to control RCS pressure if not aligned during SPTAs.

Simulator Instructions for Scenario 3

Reset simulator to MOL 60% power IC steady state.
Ensure that AACG is secured and annunciators clear.
Place MINIMAL RISK and RED Train Maintenance Week signs on 2C11.
Swing ESF equipment aligned to the RED train.
'A' CCP lead charging pump. 'C' CCP aligned to green train.
2PCV-0231, Gland Sealing Steam Pressure Control Valve failed closed.
'B' Channel Pressurizer level and pressure in service.
'B' MFWP recirc valve is throttled open maintaining 1 gpm/1 rpm
T1, T2, T3, T4, T5, & T6 set to false.
T5 = Reactor trip.
T6 = EFAS-1

Event No.	Malf. No.	Value/ Ramp Time	Event Description
1			Place 'B' MFWP in service.
2			Power Ascension.
3	XRC2TE46111 Trigger = T1	616	Tc temperature transmitter fails high. Tech Spec for SRO.
4	CVC4817DEM Trigger = T2	100 3 min.	Letdown Hand Indicating Controller (HIC) demand fails high causing low pressurizer level.
5	XRCCHBPLVL Trigger = T3	0	Channel 'B' Pressurizer level channel fails low. Tech Spec for SRO.
6	EHSYSLEAK Trigger = T4	True	Leak in the Electro Hydraulic system causing a turbine trip, reactor trip and a loss of main feedwater pumps.
7	XMSHDRPRS Trigger = T5	650	SDBCS input fails low after the Reactor trip.
8	CV0332 EFW2P7BFLT Trigger = T6	0 / Delay = 3 min. True / Delay = 1 min. 30 Sec.	2P-7A Emergency Feedwater pump overspeed trips on start and 2P-7B motor trips due to a winding failure.

Simulator Operator CUEs		
At T=0		Place 'B' MFWP in service.
Cue: When contacted as the NLO, then report 2P-1B Main Feedwater pump pre-start checks are satisfactory. **Cue: When contacted as the NLO, then report 2P-1B Main Feedwater pump is running sat.**		
Cued by lead examiner	Trigger T1	Tc temperature transmitter fails high. Tech Spec for SRO.
Cue: When contacted as the WWM, then report that I&C is developing a work package to troubleshoot the failed temperature transmitter.		
Cued by lead examiner	Trigger T2	Letdown Hand Indicating Controller (HIC) demand fails high causing low pressurizer level.
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed controller.		
Cued by lead examiner	Trigger T3	Control Channel "B" Pressurizer Level fails Low.
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed level instrument.		
Cued by lead examiner	Trigger T4	Leak in the Electro Hydraulic system causing a turbine trip, reactor trip and a loss of main feedwater pumps.
Cue: When contacted by CRS, report that EH fluid is spraying into EH pit area from a break on the common EH discharge header down stream of isolation valve 2EH-1A and is a large leak.		
Reactor Trip	Trigger T5	SDBCS input fails low after the Reactor trip.
EFAS-1	Trigger T6	2P-7A Emergency Feedwater pump overspeed trips on start and 2P-7B motor trips due to a winding failure.
Cue: If contacted as the WCO, then report after 2 min. that 2P-7A can not be reset due to a bent linkage and a loss of all governor control oil. **Cue: If contacted as the AO, then report that 2P-7B breaker has over current flags dropped on the breaker relays.** **Cue: If contacted as the WCO, then report that 2P-7B motor has black residue coming from all the motor vents but there is no fire or significant smoke present.** **Cue: If contacted as NLO, report pre-start checks are sat for 2P-75 AFW pump and after the 2P-75 is started report post start checks are sat.** **Cue: When contacted as the AO, wait approximately 4 min, then contact the Control Room and report that the breakers for the LTOP relief isolation valves are closed. (Simulator booth operator should close the breakers prior to calling the Control Room by using remote functions under RCS.)**		

Op-Test No.: 2011-1	Scenario No.: 3	Event No.: 1
Event Description: Place 'B' MFWP in service.		

Time	Position	Applicant's Actions or Behavior
T = 0	SRO	Direct the BOP to place 'B' Main Feedwater pump in service.
Cue: When contacted as the NLO, then report 2P-1B Main Feedwater pump pre-start checks are satisfactory.		
	BOP	*10.2 Verify Condensate header pressure 650 to 750 psig.
	BOP	10.3 Verify S/G levels and flows stable enough to place second MFWP on line.
	BOP	*10.4 Verify selected MFWP flow maintained ~ 1 gal/1 rpm at all times. **Examiner Note: The BOP may elect to initially throttle open the Main feedwater pump recirc to >3000 gpm because the feedwater pump should start feeding the steam generators at about 3000 RPM.**
	BOP	10.5 Slowly raise oncoming pump speed until pump speed controller demand matches Speed tracking Demand for respective FWCS. • WHEN automatic operation desired, THEN place speed controller for this pump in Automatic.
	BOP	10.6 WHEN flow and S/G levels stabilized, THEN bump selected MFWP Recirc closed while performing the following: 10.6.1 Between bumps allow flows and S/G levels to stabilize. 10.6.2 Continue bumping selected MFWP Recirc until closed.
	BOP	10.7 Adjust MFWP/CNDP Recirc Auto Close setpoint for both MFWP recirc valve controllers (pg 3 of controller) to ~ 850 psig: • 2FIC-0742 • 2FIC-0735
	BOP	10.8 Place HIC for affected MFWP Recircs in AUTO as desired.
Cue: When contacted as the NLO, then report 2P-1B Main Feedwater pump is running sat.		
Termination criteria: When 2P-1B speed controller placed in automatic.		

Op-Test No.: 2011-1	Scenario No.: 3	Event No.: 2
Event Description: Power Ascension.		

Time	Position	Applicant's Actions or Behavior
	SRO	Direct BOP to perform the following: 9.25 WHEN at ~ 40% power, THEN place second MFWP in service using Main Feedwater Pump and FWCS Operations (2106.007).
	SRO	Direct ATC to commence raising power IAW the reactivity plan and 2102.004 Power operations.
	ATC	9.12 IF NOT specified otherwise by Reactor Engineering, THEN commence raising power using Attachment A of this procedure for ASI Control and power escalation limits: • Commence RCS dilution. [Refer to Chemical Addition (2104.003)] • Raise turbine load as necessary to maintain Tref within ± 2°F of program Tave using Exhibit 1, TAVE VS TREF.

	ATC	OP-2104.003, Chemical Addition Exhibit 2 for dilution. 1.0 Verify EITHER Reactor Makeup pump (2P-109A OR 2P-109B) running. 2.0 Verify Mode Select switch (2HS-4928) in DILUTE. 3.0 Verify Reactor Makeup Water Flow controller (2FIC-4927) set up as follows: • In MANUAL OR AUTO. • Demand set to less than Charging flow. 4.0 Verify VCT Makeup Isol valve (2CV-4941-2) open. 5.0 Operate Reactor Makeup Water Flow Batch controller (2FQIS-4927) as follows: 5.1 Depress Red pushbutton. 5.2 Verify 2FQIS-4927 set for desired quantity. 5.3 Verify 2FIC-4927 indicates desired flow rate. * 6.0 Monitor the following parameters: • RCS Tave • Axial Shape Index • Reactor power 7.0 IF desired to terminate dilution, THEN reset 2FQIS-4927 to zero. 8.0 WHEN 2FQIS-4927 at zero, THEN verify the following: • RMW Flow Control valve (2CV-4927) closes. • No flow indicated on 2FIC-4927. 9.0 Repeat steps 5.0 through 8.0 as required. 10.0 Close 2CV-4941-2. 11.0 Verify 2FQIS-4927 Batch Volume placard updated to current batch volume.
	ANY	Direct a NLO to perform the following: * 9.19 Perform the following: • Monitor secondary chemistry during power escalation • Adjust chemical feed as necessary using Secondary System Chemical Addition (2106.028).
Termination criteria: When the required reactivity manipulation is complete or at lead examiner's discretion.		

Op-Test No.: 1	Scenario No.: 3	Event No.: 3
Event Description: Tc temperature transmitter fails high. Tech Spec for SRO.		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Announce annunciators: 2K04-A4 CH A RPS/ESF/PRETRIP/TRIP 2K04-B3 PPS Channel TRIP 2K04-H4 Channel Sensor Failure
	ANY	Report 'A' LPD and DNBR trip on PPS insert.
	ANY	Compare all four channels and report Core delta T power indicates low and determines that 2TE-4611-1(2TI-4605-1) is failed low.
	ALL	Implement Annunciator Corrective Action 2203.012D. 2K04-H4 Channel Sensor Failure applicable actions: 2.1 Determine affected channel by checking CPC TROUBLE lights on CPC Operator Modules. 2.3 Examine PIDs 415, 416, 417, and 418 as necessary to determine affected CPC Channel and Sensor Classification. 2.4 Select CPC Maintenance Page menu and check Option 1, Failed Sensor Status Report and Option 4, CPC Sensor Status Words to determine affected sensor and present status.
	SRO	Implement Annunciator Corrective Action 2203.012D. 2K04-A4 CH A RPS/ESF/PRETRIP/TRIP applicable actions: 2.1 Refer to PPS insert on 2C03 to determine cause. 2.2 Compare all Channels to validate alarm. 2.6 IF channel failed, THEN refer to Tech Specs 3.3.1.1, 3.3.2.1, 3.3.3.5, 3.3.3.6, and TRM 3.3.1.1. 2.8 IF a Linear Power, Log Power or CPC Channel is inoperable, THEN refer to 2105.001, CPC/CEAC Operations.

Op-Test No.: 1 Scenario No.: 3 Event No.: 3

Event Description: Tc temperature transmitter fails high. Tech Spec for SRO.

Time	Position	Applicant's Actions or Behavior
	SRO	2K04-B3 PPS Channel TRIP applicable actions: 2.1 Determine which RPS or ESFAS trips have occurred on PPS inserts. 2.3 IF channel failed, THEN refer to Tech Specs 3.3.1.1 and 3.3.2.1 and TRM 3.3.1.1.
	SRO	Enter Tech Spec **3.3.1.1 action 2** Direct BOP to bypass bistable points for the associated functional units: LPD (Bistable 3) DNBR (Bistable 4)
	BOP	Bypass the point 3, and 4 on Channel 'A' IAW OP-2105.001 CPC/CEAC operations 11.1 Refer to Tech Spec 3.3.1.1, 3.3.2.1, 3.3.3.5, 3.3.3.6 and TRM 3.3.1.1. 11.2 Circle channel and functional units (points) to be bypassed below: Channel to be bypassed: (A) B C D Points to be bypassed: 1 2 (3 4) 5 6 7 8 9 10 11 12 13 16 17 18 19 20 11.3 Enter appropriate Tech Spec/TRM actions. 11.4 Verify points to be bypassed NOT bypassed in ANY other channel. 11.5 Place desired points in BYPASS for selected channel on 2C23.

Op-Test No.: 1 Scenario No.: 3 Event No.: 3

Event Description: Tc temperature transmitter fails high. Tech Spec for SRO.

Time	Position	Applicant's Actions or Behavior
	ANY	Verify annunciator 2K04-C3 PPS CHANNEL BYPASSED Verify correct channels in bypass.
	SRO	Contact work management.
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed temperature instrument.		
Termination Criteria: Affected channel points placed in bypass or at lead examiner's discretion.		

Op-Test No.: 2011-1	Scenario No.: 3	Event No.: 4
Event Description: Letdown Hand Indicating Controller (HIC) demand fails high causing low pressurizer level.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ATC	Determine that the letdown flow is elevated causing pressurizer level to lower.
	SRO	Direct manual control of letdown.
Examiner Note: The guidance to take manual control of letdown flow is contained in the ACA for 2K-12 B1 Regen Hx to 2E-29 Temperature HI, 2K-12 C1 Letdown Heat exchanger temperature HI, and 2K-12 F1 Letdown to Purification Filters Flow HI but the letdown alarms may not come in this case prior to the crew recognizing the failure. **The SRO may elect to use the guidance contained in EN-OP-115 Conduct of Operations which states the following.** **If an automatic control malfunctions, immediately place that control in manual.**		
2K-12 B1	ANY	2.1 Check temperature on 2TI-4820 and Computer Point (T4820).
	ATC	2.2 IF Letdown Flow Controller (2HIC-4817) NOT controlling in AUTOMATIC, THEN perform the following per Chemical and Volume Control (2104.002): 2.2.1 Place 2HIC-4817 in MANUAL. 2.2.2 Stabilize flow.
2K-12 C1	ANY	2.1 Check temperature on 2TI-4815 and Computer Point (T4805).
	ATC	2.2 Verify letdown flow (2FIS-4801) within 10 gpm of charging flow (2FIS-4863). Refer to Chemical and Volume Control (2104.002). **Examiner Note: The ATC will be required to control letdown in manual until completion of the drill.**
2K-12 F1	ANY	2.1 Check flow on 2FIS-4801 and Computer Point (F4801).
	ATC	2.2 IF Letdown Flow Controller (2HIC-4817) NOT controlling in AUTOMATIC, THEN perform the following per Chemical and Volume Control (2104.002): 2.2.1 Place 2HIC-4817 in MANUAL. 2.2.2 Reduce flow to < 128 gpm.
	SRO	Contact Work Week Manager to repair 2HIC-4817.

Op-Test No.: 2011-1	Scenario No.: 3	Event No.: 4
Event Description: Letdown Hand Indicating Controller (HIC) demand fails high causing low pressurizer level.		

Time	Position	Applicant's Actions or Behavior
2K-12 J1	ANY	Radmonitor Flow Low applicable actions: 2.3 Verify letdown flow (2FIS-4801) > 28 gpm. Refer to Chemical and Volume Control (2104.002). 2.4 Verify L/D to Rad Monitor (2CV-4804) open.
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed controller.		
Termination Criteria: Letdown being controlled in manual or at lead examiner's discretion.		

Op-Test No.: 2011-1	Scenario No.: 3	Event No.: 5
Event Description: 'B' Pressurizer level channel fails Low. Tech Spec for SRO.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Announce alarm 2K10-F7 CNTRL CH 2 LEVEL LO LO and 2K10-G7 CNTRL CH 2 LEVEL LO Report 2LI-4627-1 and 2LR-4625 indicate normal. All charging pumps are running.
	SRO	Enter and implement AOP 2203.028, PZR Systems Malfunctions
	SRO	6. Check the following PZR level annunciators clear: • "CNTRL CH 1/2 LEVEL LO" 2K10-G6/G7 **(Annunciators not clear, implement contingency)** • "CNTRL CH 1/2 LEVEL HI" 2K10-J6/J7
	ANY	6. Perform the following: A. Compare PZR level instruments to determine the affected channel.
	ATC	C. IF selected control channel failed, THEN perform the following: 1) Place Letdown Flow controller (2HIC-4817) in MANUAL. **Examiner Note: Letdown will already be in manual due to previous failure but this does not significantly impact the PZR level failure because if letdown was in auto it would only lower 12 gpm.**
	ATC	2) Place PZR Level Channel Select switch (2HS-4628) to unaffected channel. **(Channel 1)**
	ATC	3) Place PZR Low Level Cutoff select switch (2HS-4642) to unaffected channel. **(Channel A)**
	ANY	4) Verify PZR heaters and Normal Spray operating to restore RCS pressure 2025 to 2275 psia. **Examiners Note: The ATC should restore the PZR proportional heater to operation.**
	ATC	5) WHEN Letdown Flow controller (2HIC-4817) automatic AND manual signals match, THEN place Letdown Flow controller in AUTO. **Examiner Note: Letdown can not be restored to auto based on the earlier demand failure.**

Op-Test No.: 2011-1 Scenario No.: 3 Event No.: 5

Event Description: 'B' Pressurizer level channel fails Low. Tech Spec for SRO.

Time	Position	Applicant's Actions or Behavior
	SRO	E. Refer to TS 3.3.3.5, Remote Shutdown Instrumentation and 3.3.3.6, Post-Accident Instrumentation. **Examiner Note: SRO must enter Tech Spec 3.3.3.5 Remote Shutdown Instrumentation and 3.3.3.6 action 1 for Post Accident Instrumentation.**
	SRO	Contact work management.
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed level instrument.		
Termination Criteria: PZR level control selected to channel 1 or at lead examiner's discretion.		

Op-Test No.: 2011-1 Scenario No.: 3 Event No.: 6 & 7

Event Description: Leak in the Electro Hydraulic system causing a turbine trip, reactor trip and a loss of main feedwater pumps. SDBCS input fails low after the Reactor trip.

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Report Annunciators 2K02-A9, EH Header Press LO and 2K02-B9, EH Pump 2P14A/B Auto Start are in alarm and report that Standby EH Pump 2P14B automatically started.
	SRO	Refer to ACA for 2K02-A9 and direct appropriate actions.
	BOP	2.1 Check EH pressure on 2PI-9650 and Computer point P9650.
	BOP	2.2 Verify standby EH pump (2P-14A or 2P-14B) started.
	ANY	Direct NLO to investigate locally and perform the following step if it can be accomplished. 2.3 Adjust header pressure to between 1580 and 1620 psig using 2106.012, Electrohydraulic Oil System Operation.
Cue: When contacted by CRS, report that EH fluid is spraying into EH pit area from a break on the common EH discharge header down stream of isolation valve 2EH-1A and is a large leak.		
	BOP	Monitor EH pressure and report that pressure is approaching Main Turbine Generator (MTG) trip set point and recommend manually tripping the plant. **Examiner Note: The crew should take conservative action and trip the reactor prior to the Turbine trip. If the Turbine trips the reactor should trip shortly afterward if not automatically tripped.**
	ANY	If the Turbine automatically trips, then trip the reactor.
	BOP	Place both EH pump in PTL to stop the EH leak.
Cue: If the crew does not place both EH pumps in PTL then 3 minutes after the reactor trip call as the NLO and report that the running EH pumps are cavitating.		
	ANY	Report Reactor Tripped
	SRO	Enter and implement EOP 2202.001, Standard Post Trip Actions.
	SRO	1. Notify Control Board Operators to monitor safety functions using Exhibit 7, CBO Reactor Trip Checklist. 2. Open Safety Function Tracking page.
Reactivity control safety function	ATC	3. Check Reactivity Control established as follows: A. Reactor power lowering. B. ALL CEAs fully inserted.

Op-Test No.: 2011-1 Scenario No.: 3 Event No.: 6 & 7

Event Description: Leak in the Electro Hydraulic system causing a turbine trip, reactor trip and a loss of main feedwater pumps. SDBCS input fails low after the Reactor trip.

Time	Position	Applicant's Actions or Behavior
	BOP	Complete Post Trip contingencies to align gland seal steam using 2CV-0233 Gland Seal Bypass Valve.
Vital Auxiliaries safety function	BOP	4. Check Maintenance of Vital Auxiliaries satisfied: A. Main Turbine tripped. B. Generator Output breakers open. C. Exciter Field breaker open. D. At least ONE 6900v AC bus energized E. At least ONE 4160v Non-vital AC bus energized. F. BOTH 4160v Vital AC buses energized. G. BOTH DGs secured. H. At least ONE 125v Vital DC bus energized: 2D01 - SPDS point E2D01 2D02 - SPDS point E2D02
RCS Inventory Control Safety function	ATC	5. Check RCS Inventory Control established as follows: A. PZR level: • 10 to 80%. • Trending to setpoint. B. RCS MTS 30°F or greater. **Examiner Note: Letdown will still be in manual and will need to be controlled by the ATC**
RCS Pressure Control Safety function	ATC	6. Check RCS Pressure Control: —— • 1800 to 2250 psia. —— • Trending to setpoint.

Op-Test No.: 2011-1 Scenario No.: 3 Event No.: 6 & 7

Event Description: Leak in the Electro Hydraulic system causing a turbine trip, reactor trip and a loss of main feedwater pumps. SDBCS input fails low after the Reactor trip.

Time	Position	Applicant's Actions or Behavior
Core Heat Removal safety function.	ATC	7. Check Core Heat Removal by forced circulation: A. At least ONE RCP running. B. CCW flow aligned to RCPs. C. Loop delta T less than 10°F. D. RCS MTS 30°F or greater. E. Check SW aligned to CCW. F. IF SIAS or MSIS actuated, THEN maintain SW header pressure greater than 85 psig.
RCS Heat Removal Safety Function	BOP	8. Check RCS Heat Removal: A. Check SG available by BOTH of the following: • At least ONE SG level 10 to 90%. • FW maintaining SG level. **(Should not be met due to loss of EFW and main feed water, perform contingency)** B. Check MFW in RTO. **(Should not be met due to loss of main feed water, contingency is satisfied)** C. Check Feedwater line intact by the following: • SG level stable or rising. • NO unexplained step changes or erratic FW flow. • NO unexplained step changes or erratic Condensate flow. D. Check SG pressure 950 to 1050 psia. **(Contingency should be performed due to SDBCS failure)** F. Check RCS TC 540 to 555°F.

Op-Test No.: 2011-1 Scenario No.: 3 Event No.: 6 & 7

Event Description: Leak in the Electro Hydraulic system causing a turbine trip, reactor trip and a loss of main feedwater pumps. SDBCS input fails low after the Reactor trip.

Time	Position	Applicant's Actions or Behavior
Cue: If contacted as the WCO, then report after 2 min. that 2P-7A can not be reset due to a bent linkage and a loss of all governor control oil. **Cue: If contacted as the AO, then report that 2P-7B breaker has over current flags dropped on the breaker relays.** **Cue: If contacted as the WCO, then report that 2P-7B motor has black residue coming from all the motor vents but there is no fire or significant smoke present.**		
RCS Heat Removal Safety Function	SRO	Direct the following actions as necessary: 8. Check RCS Heat Removal: A. Perform the following: ____ 1) IF SG level lowering, THEN verify EFAS actuated. **(May be automatically actuated previously)** ____ 2) IF SG level less than 10%, THEN verify total flow greater than 485 gpm. **(Can not be verified due to Loss of Feedwater)** 5) IF FW NOT available, THEN perform the following: a) Verify maximum of ONE RCP running in each loop. **(SRO may elect to secure all RCPs to minimize heat input)** b) Close SG Blowdown Isolation valves: • 2CV-1016-1 • 2CV-1066-1 c) GO TO Step 8.C. D. Perform as necessary: 2) Verify SDBCS restoring SG pressure 950 to 1050 psia. **Examiner Note: Step 5 may not be implemented when the crew assesses RCS heat removal to due to timing of the EFW pumps tripping after the actuation but the SRO should return and complete step 5.**

Op-Test No.: 2011-1 Scenario No.: 3 Event No.: 6 & 7

Event Description: Leak in the Electro Hydraulic system causing a turbine trip, reactor trip and a loss of main feedwater pumps. SDBCS input fails low after the Reactor trip.

Time	Position	Applicant's Actions or Behavior
Containment Safety Function	ANY	9. Check CNTMT parameters: A. Temperature and Pressure: • Temperature less than 140°F. • Pressure less than 16 psia. B. Check CNTMT Spray pumps secured. C. NO CNTMT radiation alarms or unexplained rise in activity: 1) CAMS alarms: • "CNTMT PART/GAS RAD HI/LO" annunciator (2K10-B6) clear. 2) RCS leakage alarms: • "AREA RADIATION HI/LO" annunciator (2K11-B10) clear. • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. 3) Check the following radiation monitors trend stable: • CNTMT Area • CAMS • Process Liquid D. NO secondary system radiation alarms or unexplained rise in activity: 1) "SEC SYS RADIATION HI" annunciator (2K11-A10) clear. 2) Secondary Systems Radiation monitors trend stable: • Main Steam lines • SG Sample • Condenser Off Gas
	SRO	10. Notify STA to report to control room. 11. Verify NLOs informed of Reactor trip. 12. Verify Reactor trip announced on Plant page. 13. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.

Op-Test No.: 2011-1 Scenario No.: 3 Event No.: 6 & 7

Event Description: Leak in the Electro Hydraulic system causing a turbine trip, reactor trip and a loss of main feedwater pumps. SDBCS input fails low after the Reactor trip.

Time	Position	Applicant's Actions or Behavior
	SRO	14. Direct control board operators to acknowledge ALL annunciators and announce ALL significant alarms.
	SRO	15. Check ALL safety function acceptance criteria satisfied. **(All safety functions are not satisfied, perform contingency)** 15. IF ANY safety function acceptance criteria NOT satisfied, THEN perform the following: A. Notify control room staff of safety functions NOT satisfied. B. GO TO Exhibit 8, Diagnostic Actions.
	SRO	Diagnose Loss of Feedwater EOP 2202.006.
Termination Criteria: Feedwater has been restored per event #8 or at lead examiner's discretion.		

Op-Test No.: 2011-1	Scenario No.: 3	Event No.: 8
Event Description: 2P-7A Emergency Feedwater pump overspeed trips on start and 2P-7B motor trips due to a winding failure.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	SRO	Direct Actions of 2202.006 Loss of Feedwater.
	SRO	Direct STA to perform the following: * 1. Confirm diagnosis of Loss Of Feedwater by checking SFSC acceptance criteria satisfied every 15 minutes.
	SRO	* 2. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification. 3. Open Placekeeping page. 4. Notify Control Board Operators to monitor floating steps.
	ATC	5. Reduce RCS heat input as follows: A. Stop ALL RCPs. B. Verify BOTH PZR Spray valves in MANUAL and closed.
	BOP	6. Conserve SG inventory as follows: A. Verify SG Blowdown Isolation valves closed: • 2CV-1016-1 • 2CV-1066-1 B. Verify SG Sample valves closed.
	ANY	■ 7. Check ALL AC and Vital DC buses energized.
Critical Task	ATC	* 8. Maintain RCS pressure 1800 to 2250 psia with the following: • PZR heaters. • Aux spray using 2202.010 Attachment 27, PZR Spray Operation. **Use attachment 27 to maintain RCS pressure within the Pressure-Temperature limits of 200°F and 30°F Margin to Saturation.**
	SRO	Direct a NLO to perform the following: 9. Locally remove danger tags and close the following breakers: • 2B51-E4 “LTOP RELIEF ISOL 2CV-4730-1” • 2B51-K2 “LTOP RELIEF ISOL 2CV-4741-1”

Op-Test No.: 2011-1	Scenario No.: 3	Event No.: 8

Event Description: 2P-7A Emergency Feedwater pump overspeed trips on start and 2P-7B motor trips due to a winding failure.

Time	Position	Applicant's Actions or Behavior
Cue: When contacted as the AO, wait approximately 4 min, then contact the Control Room and report that the breakers for the LTOP relief isolation valves are closed. (Simulator booth operator should close the breakers prior to calling the Control Room by using remote functions under RCS.)		
	SRO	11. Establish EFW flow to SGs from EFW pump 2P7B as follows: A. Check 2P7B available. **(Not met perform contingency)**
	SRO	A. IF 2P7B NOT available, THEN GO TO Step 12.
	SRO	12. Establish EFW flow to SGs from EFW pump 2P7A as follows: **Examiner Note: 2P-7A is not available and the SRO will continue on to step 13.**
	SRO	13. Establish AFW flow to SGs from AFW pump 2P75 as follows:
	ANY	A. Check 4160v non-vital bus 2A1 energized.
	ANY	C. Check MSIS AND CSAS reset.
	BOP	D. Perform the following to start AFW Lube Oil pump 2P225: 1) Place 2HS-0766 in ON. 2) Check 2P225 amber light OFF.
Cue: If contacted as NLO, report pre-start checks are sat for 2P-75 AFW pump and after the 2P-75 is started report post start checks are sat.		
	BOP	E. IF SG level less than 49%, THEN verify following valves closed: • 2P75 to EFW Train "A" Flow Control Valve (2CV-0761) • 2P75 to EFW Train "B" Flow Control Valve (2CV-0760)
	BOP	F. Start 2P75.
	BOP	G. Perform the following to secure AFW Lube Oil pump 2P225: 1) Place 2HS-0766 in OFF. 2) Place 2HS-0766 in AUTO.

Op-Test No.: 2011-1	Scenario No.: 3	Event No.: 8

Event Description: 2P-7A Emergency Feedwater pump overspeed trips on start and 2P-7B motor trips due to a winding failure.

Time	Position	Applicant's Actions or Behavior
Critical Task **Restore Feedwater using 2P-75 AFW pump prior to both S/Gs reaching 70 inches wide range level.**	BOP	H. IF a SG level was less than 49%, THEN perform the following: 1) Throttle open associated "2P75 to EFW Train Flow Control Valve" to establish flow of less than 150 gpm: • "A" EFW - 2CV-0761 • "B" EFW - 2CV-0760 2) Maintain feed flow to SG less than 150 gpm until level rise noted or feed flow has been maintained for greater than 5 minutes.
	BOP	I. Restore SG level to 60% using 2202.010 Attachment 46, Establishing EFW Flow.
Termination criteria: Feedwater restored to both S/Gs with level restoring to setpoint or at examiner's discretion.		

Facility: ANO-2	Scenario No.: 2 (New)	Op-Test No.: 2011-1

Examiners:	Operators:

Initial Conditions:
100% MOL; All Engineered Safety Features systems are in standby. Gland Seal Steam Pressure Control Valve 2PCV-0231 jacked closed. RED Train Maintenance Week

Turnover:
100%. 250 EFPD. EOOS indicates 'Minimal Risk'. Gland Seal Steam Pressure Control Valve 2PCV-0231 jacked closed; manually control seal steam pressure. RED Train Maintenance Week.

Event No.	Malf. No.	Event Type*	Event Description
1	XSI2LT-5637	I (BOP) I (SRO)	RWT level transmitter fails low. Tech Spec for SRO.
2	SW2P4AWND	C (BOP) C (SRO)	2P-4A Service water pump high winding temperature causing pump swap.
3	SGATUBE	R (ATC) N (BOP) N (SRO)	Shutdown required due to 4 gpm steam generator tube leak on 'A' steam generator. Tech Spec for SRO.
4	CVC2P39B	C(ATC) C(SRO)	2P-39B Boric Acid Makeup pump will trip when it is started.
5	SGATUBE	M (ALL)	'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.
6	CEA35STUCK CV48731 CVC4916SIAS	C (ATC) C (SRO)	Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.
7	ESFK401AAF 416A406 K05-C03	C (BOP) C (SRO)	2CV-5017-1, 2CV-5015-1 Low pressure safety injection (LPSI) and High pressure safety injection valves (HPSI) fail to open and the "B" HPSI pump trips due to motor overload.

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

Total malfunctions. = 7, Malfunctions after EOP entry = 2, Abnormal events = 3, Major transient = 1, EOPs with substantive actions =1, EOP Contingencies = 0, Critical tasks = 3.

Scenario #2 Objectives

1) Evaluate individual response to a failure of a Refueling water tank level transmitter.
2) Evaluate individual response to a failure of a Service Water pump motor.
3) Evaluate individual ability to operate safety related equipment.(swap service water pump)
4) Evaluate individual response to a primary to secondary leak.
5) Evaluate individual ability to perform a reduction in plant power.
6) Evaluate individual response to a failure of a Boric Acid Makeup pump.
7) Evaluate individual response to a stuck out CEA after a Reactor Trip.
8) Evaluate individual response to failed ESF relays causing multiple high pressure and low pressure injection valve to not automatically reposition.
9) Evaluate individual ability to mitigate a Steam Generator Tube rupture.
10) Evaluate individual ability to monitor operation of Engineered Safety Features equipment.

SCENARIO #2 NARRATIVE

Simulator session begins with the plant at 100% power steady state Gland Seal Regulator; 2PCV-0231 is jacked closed.

When the crew has completed their control room walk down and brief, the RWT level transmitter 2LT-5637-2 will fail low. The SRO should enter Tech Specs 3.3.2.1 ESF Actuation system instrumentation and 3.3.3.6 Post accident instrumentation. The BOP will be required to bypass the Plant Protection System channel 2 for RWT level point 18.

When the appropriate Tech specs have been entered and the BOP goes to the back panel to bypass point 18 and cued by lead examiner; the ‘A’ Service Water Pump (2P-4A) winding temperature will come into alarm. The SRO will use the Annunciator Corrective action and direct swapping service water pumps. The BOP will swap service water pumps by placing 2P-4B Service Water Pump in service supplying loop 1 Service Water.

After the Crew has swapped service water pumps and cued by lead examiner, a primary to secondary leak will start. The SRO will enter the primary to secondary leakage AOP, OP 2203.038. ATC and BOP will perform RCS Leak rate determinations. The SRO will enter Tech Spec 3.4.6.2. The SRO will direct the NLO’s to control secondary contamination using standard attachment 19 and direct the chemists to sample the SG’s for activity. The crew will isolate Main steam from ‘A’ Steam Generator to 2P-7A EFW pump and commence a plant shutdown using boration from Boric Acid Make up tank.

SCENARIO #2 NARRATIVE (continued)

When the boration is started 2P-39B Boric Acid Makeup pump will trip and the ATC will need to swap boric acid make up pumps. If the ATC attempts to use the gravity feed boration method, it will not work due to the Volume Control tank outlet valve not closing. The SRO may refer to the TRM for boration flow paths.

After the ATC has performed the required power reduction and cued by the lead examiner, the primary to secondary leak value will ramp up to 200 GPM. The Crew will recognize that the leak rate is greater than reactor trip criteria of 44 GPM. The SRO will direct tripping the reactor and actuating Safety Injection Actuation Signal and Containment Cooling Actuation Signal.

The Crew will implement Standard Post Trip Actions (SPTA), OP 2202.001. When the reactor trips one CEA will remain withdrawn which requires emergency boration. The VCT outlet will remain open and emergency borate valve will fail to auto open from SIAS. The ATC will commence emergency boration by opening 2CV-4916-2 emergency borate valve. Two LPSI and HPSI injection valve fail to automatically open. The BOP will open HPSI valves and the crew may determine to open the LPSI even though they are not currently required for plant conditions. The ATC will secure two Reactor coolant Pumps when RCS pressure goes below 1400 psia. The Crew will lower Steam Dump master controller setpoint during SPTAs to aid in maintaining margin to saturation. The BOP will also override Service Water to Component Cooling water to allow RCP operation.

The SRO will diagnose a Steam Generator Tube Rupture event and enter OP 2202.004, Steam Generator Tube Rupture. The ATC will cool down the RCS to less than 535°F using the bypass valves to the condenser. The BOP will override Service Water to Auxiliary Cooling Water. The BOP will isolate the ‘A’ SG using standard attachment 10 when RCS Thot is less than 535°F.

Simulator Instructions for Scenario 2

Reset simulator to MOL 100% power IC steady state.
Ensure that AACG is secured and annunciators clear.
Place MINIMAL RISK, Green Train Protected and RED Train Maintenance Week signs on 2C11.
'A' CCP lead charging pump. 'C' CCP aligned to green train.
2PCV-0231, Gland Sealing Steam Pressure Control Valve failed closed.
T1, T2, T3, T4, T5 set to false.
T4 = SIAS2
T5 = hf3b4928 (2HS-4928 mode select switch in borate)

Event No.	Malf. No.	Value/ Ramp Time	Event Description
1	XSI2LT-5637 Trigger = T1	0	RWT level transmitter fails low.
2	SW2P4AWND Trigger = T2	True	2P-4A Service water pump high winding temperature causing pump swap.
3	SGATUBE Trigger = T3	4/ 2 min.	Shutdown required due to 4 gpm steam generator tube leak on 'A' steam generator. Tech Spec for SRO.
4	CVC2P39B Trigger = T5	True	2P-39B Boric Acid Makeup pump will trip when it is started.
5	SGATUBE	200/ 5 min.	'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.
6	CEA35STUCK CV48731 CVC4916SIAS	0% 1 True	Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.
7	ESFK401AAF 416A406 K05-C03 Trigger 4 for "B" HPSI breaker and alarm	True Lck_Op / Delay 15 sec On / Delay 15 sec	2CV-5017-1, 2CV-5015-1 Low pressure safety injection (LPSI) and High pressure safety injection valves (HPSI) fail to open and the "B" HPSI pump trips due to motor overload.

Simulator Operator CUEs		
At T=0	Trigger T1	RWT level transmitter fails low.
Cue: When contacted as the WWM, then report that I&C will start planning a work package to repair the failed instrument.		
Cued by lead examiner	Trigger T2	2P-4A Service water pump high winding temperature causing pump swap.
Cue: If asked, report that the motor for 'A' Service Water Pump is very hot to touch. **Cue: When contacted as NLO, report that intake Door louvers open, Space heaters secured, Intake Heater (2VEH-1) ON/OFF toggle switch in OFF (down), Sheet metal plates above SW pump motors removed.** **Cue: NLO reports that oil level is between Min and Max mark for 2P-4B service water pump.** **Cue: NLO report that SW pump packing leakoff is acceptable, Air/Vacuum Release valve vented pump and is closed, solid stream of pressurized water issuing from the constant vent line.** **Cue: If contacted as Chemistry, then respond by telling the control room that you will realign chemical injection to the appropriate pumps.** **Cue: When contacted as the WWM, then report that electrical maintenance will investigate the high winding temperature.**		
Cued by lead examiner	Trigger T3	Shutdown required due to 4 gpm steam generator tube leak on 'A' steam generator.
Cue: If contacted as NLO to investigate N-16 monitors locally, report that you do not see any problems with the N-16 monitor but their readings are elevated(give them the CR N-16 readings). **Cue: If contacted as Chemistry, then report you will sample Secondary system for activity using 1604.013, Measurement of Primary to Secondary Leak Rate.** **Cue: If contacted as the AO, then report you are commencing Standard Attachment 19 control of secondary contamination.**		
	Trigger T5	2P-39B Boric Acid Makeup pump will trip when it is started.
Cue: If contacted as NLO, report the 2P-39B breaker 2B62-B6 breaker is trip free and 2P-39B motor has an acrid odor.		
Cued by lead examiner		'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.
Cue: When contacted as Chemistry, then report you will sample both S/G for activity and Monitor RDACS for off site dose releases. **Cue: If contacted as the AO, then report after 5 min that the local portions of Attachment 10 for 'A' S/G are complete.**		
		Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.
SIAS2	Trigger T4	2CV-5017-1, 2CV-5015-1 Low pressure safety injection (LPSI) and High pressure safety injection valves (HPSI) fail to open and the "B" HPSI pump trips due to motor overload.

Cue: If asked, report that the motor for 'B' High Pressure Injection pump is hot to touch, but no fire or smoke is evident. **Cue: If asked, report that the over current drop flags for 'B' High Pressure Injection pump are dropped.**

Op-Test No.: 2011-1	Scenario No.: 2	Event No.: 1
Event Description: RWT level transmitter fails low. Tech Spec for SRO.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Announce annunciators: 2K04-A5 CH B RPS/ESF/PRETRIP/TRIP 2K04-B3 PPS Channel TRIP 2K06-A9 RWT level Lo Lo RAS pretrip.
	ANY	Report RAS pretrip/trip on PPS insert. Also, report channel 2 RWT level reading 0.
	BOP	Compare all four channels and report 2LT-5637-2 indicates zero.
Cue: If contacted as the WCO, report that 2LT-5637-2 is not leaking and there are no local indications of a problem.		
	SRO	Implement Annunciator Corrective Action 2203.012D. 2K04-A5 CH B RPS/ESF/PRETRIP/TRIP applicable actions: 2.1 Refer to PPS insert on 2C03 to determine cause. 2.2 Compare all Channels to validate alarm. 2.6 IF channel failed, THEN refer to Tech Specs 3.3.1.1, 3.3.2.1, 3.3.3.5, 3.3.3.6, and TRM 3.3.1.1. 2K04-B3 PPS Channel TRIP applicable actions: 2.1 Determine which RPS or ESFAS trips have occurred on PPS inserts. 2.3 IF channel failed, THEN refer to Tech Specs 3.3.1.1 and 3.3.2.1 and TRM 3.3.1.1.
	SRO	Enter Tech **3.3.2.1, and 3.3.3.6.** Direct BOP to bypass bistable points for the associated functional units: RWT level low (Bistable 18). **Examiner Note: SRO must enter Tech Spec 3.3.2.1 action 10 and 3.3.3.6 action 1 for Post Accident Instrumentation.**

		Bypass point 18 on PPS Channel B: 11.1 Refer to Tech Spec 3.3.1.1, 3.3.2.1, 3.3.3.5, 3.3.3.6 and TRM 3.3.1.1. 11.2 Circle channel and functional units (points) to be bypassed below: Channel to be bypassed: A (B) C D Points to be bypassed: 1 2 3 4 5 6 7 8 9 10 11 12 13 16 17 (18) 19 20 11.3 Enter appropriate Tech Spec/TRM actions. 11.4 Verify points to be bypassed NOT bypassed in ANY other channel. 11.5 Place desired points in BYPASS for selected channel on 2C23. **Examiners Note: Key 12 required.**
	ANY	Verify annunciator 2K04-C3 PPS CHANNEL BYPASSED Verify correct channels in bypass.
	SRO	Contact work management.
Cue: When contacted as the WWM, then report that I&C will start planning a work package to repair the failed instrument.		
Termination criteria: Affected channel points placed in bypass or at lead examiner's discretion.		

Op-Test No.: 2011-1	Scenario No.: 2	Event No.: 2
Event Description: 2P-4A Service water pump high winding temperature causing pump swap.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Report alarm 2K10-K2 SW PUMPS BRG/WDG TEMP HI **Examiner Note: Should be cued as soon as point 18 is bypassed due to time for temperature to trend up to the alarm setpoint (approximately 5 min.).**
	BOP	2.1 Check 2TR-1428 to determine affected pump.
	BOP	2.2 Press ACK ALM1 2TRS-1428 to acknowledge alarm and allow reflash.
	ANY	2.3 Verify the following as necessary to ensure adequate Intake Structure Ventilation: • Both Intake Structure Exhaust Fans running: - 2VEF-25A - 2VEF-25B **(should be started)** • Door louvers open. • Space heaters secured. • Intake Heater (2VEH-1) ON/OFF toggle switch in OFF (down). • Sheet metal plates above SW pump motors removed.
Cue: If asked, report that the motor for 'A' Service Water Pump is very hot to touch. **Cue: When contacted as NLO, wait ~ 2 minutes and report that intake Door louvers open, Space heaters secured, Intake Heater (2VEH-1) ON/OFF toggle switch in OFF (down), and Sheet metal plates above SW pump motors removed previously but have been checked.**		
	BOP	2.4 IF unable to reduce temperature, THEN shift to standby Service Water pump.
Examiners note: The Crew may elect to not use the normal procedure due to the rate of temperature rise.		
	BOP	Except from OP-2104.029 Service water system operation. 19.0 STARTING AND STOPPING SERVICE WATER PUMPS 19.1 IF desired to START Service Water Pump (2P-4A, 2P-4B or 2P-4C), THEN perform the following:

	BOP	19.1.2 IF NOT starting SW pump to pump down bay, THEN verify suction source aligned to ECP or Lake per Shifting Service Water Suction Sources section of this procedure.
	BOP	Calls NLO to verify the following: 19.1.3 Verify motor oil levels between Min and Max mark.
Cue: NLO reports that oil level is between Min and Max mark for 2P-4B service water pump.		
	BOP	19.1.4 Start selected SW Pump (2P-4A/B/C).
	BOP	19.1.5 Check appropriate pressures rise: • Loop 1 SW: 2PIS-1417-1 or P1417-1 • Loop 2 SW: 2PIS-1423-2 or P1423-2 • ACW: 2PI-1603 or P1603
	BOP	Calls NLO to verify the following: 19.1.6 Check the following for proper response: • SW pump packing leakoff acceptable (enough to cool the packing, not so excessive that a safety hazard is created). • Air/Vacuum Release valve vents pump for maximum of two minutes, then closes (verified by audible response). • Solid stream of pressurized water issuing from the Constant Vent line.
Cue: NLO report that SW pump packing leakoff is acceptable, Air/Vacuum Release valve vented pump and is closed, solid stream of pressurized water issuing from the constant vent line.		
	BOP	19.2 IF desired to STOP Service Water Pump (2P-4A), THEN perform the following: 19.2.1 Verify ANY of the following: • 2P-4B aligned to Loop 1 SW per Attachment I and running. **(This condition is satisfied)** • Requirements of 1015.008, Unit 2 SDC Control met. • Appropriate Tech Specs entered for inoperable SW loop. Refer to 2203.022, Loss of Service Water.
	BOP	19.2.2 Secure Service Water pump (2P-4A).
Examiner Note: The crew may determine to place 2P-4A service water pump in PTL due to the high winding temperature.		
	BOP	19.2.3 IF 2P-4B in operation on Loop 1 SW, THEN check header pressures reading as follows: • Loop 1 SW (2PIS-1417-1 or P1417-1) (55 to 118 psig) • ACW (2PI-1603 or P1603) (35 to 118 psig)

	BOP	Calls NLO to verify the following: 19.2.4 Check 2P-4A Discharge Check Valve (2SW-2A) closes. 19.2.5 Verify 2P-4A shaft rotation stops.
Cue: NLO report that 2P-4A SW pump discharge check valve is closed as indicated by a slam and the 2P-4A shaft rotation has stopped.		
	BOP	19.2.6 IF SW pump manipulations complete, THEN inform Chemistry of present SW pump configuration.
Cue: If contacted as Chemistry, then respond by telling the control room that you will realign chemical injection to the appropriate pumps.		
	SRO	Contact Work Week Manager to investigate/ repair 2P-4A service water pump.
Cue: When contacted as the WWM, then report that electrical maintenance will investigate the high winding temperature.		
Termination criteria: When 2P-4B is running and 2P-4A is secured or at lead examiner's discretion.		

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 3 & 4

Event Description: Shutdown required due to 4 gpm steam generator tube leak on 'A' steam generator. Tech Spec for SRO. 2P-39B Boric Acid Makeup pump will trip when it is started.

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Announce alarm SEC SYS RADIATION HI.
Cue: If contacted as NLO to investigate N-16 monitors locally, report that you do not see any problems with the N-16 monitor but their readings are elevated(give them the CR N-16 readings).		
	SRO	Enter and Implement AOP 2203.038, Primary to Secondary leakage.
	SRO	2. Notify Control Board Operators to monitor floating steps.
	ATC	*3. Cycle Charging pumps to maintain PZR level within 5% of setpoint.
	ANY	*4. Check PZR level maintained within 10% of setpoint.
	ANY	6. Notify Chemistry to sample Secondary system for activity using 1604.013, Measurement of Primary to Secondary Leak Rate.
Cue: If contacted as Chemistry, then report you will sample Secondary system for activity using 1604.013, Measurement of Primary to Secondary Leak Rate.		
	ATC	7. Initiate secondary contamination control using 2202.010 Attachment 19, Control of Secondary Contamination.
Cue: If contacted as the AO, then report you are commencing Standard Attachment 19 control of secondary contamination.		
	ATC	*8. Maintain VCT level 60 to 75%; refer to 2104.003, Chemical Addition.
	ANY	9. Determine Primary to Secondary leakrate by ANY of the following: • Computer RCS LKRT programs. • Check PZR level stable and use Charging and Letdown mismatch minus Controlled Bleed Off. • Check Letdown isolated and estimate RCS leak rate by total Charging flow minus Controlled Bleed Off. • Chemistry leakrate calculation using 1604.013, Measurement of Primary to Secondary Leakage. • SG Tube Leak N-16 monitors. • Manual leakrate calculation.

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 3 & 4

Event Description: Shutdown required due to 4 gpm steam generator tube leak on 'A' steam generator. Tech Spec for SRO. 2P-39B Boric Acid Makeup pump will trip when it is started.

Time	Position	Applicant's Actions or Behavior
	ANY	*10. Refer to TS 3.4.6.2, Reactor Coolant System Leakage. **Examiner Note: SRO must enter Tech Spec 3.4.6.2 action a due to primary to secondary leakage**
	ATC	12. Determine leaking SG by ANY of the following: A. Secondary Systems Radiation Trend recorder: • 2RR-1057 B. SG Sample Radiation monitors: • 2RITS-5854 • 2RITS-5864 C. Main Steam Line Radiation monitors: • 2RI-1007 • 2RI-1057 D. SG water sample results. E. SG Tube Leak N-16 monitors.
	SRO	When the Leakrate is determined to be greater than 44 gpm the SRO will direct the Reactor trip. ■13. IF RCS leakage greater than 44 gpm AND in Mode 1 OR 2, THEN perform the following: A. Trip Reactor. B. Actuate SIAS. C. Actuate CCAS D. GO TO 2202.001, Standard Post Trip Actions.

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 3 & 4

Event Description: Shutdown required due to 4 gpm steam generator tube leak on 'A' steam generator. Tech Spec for SRO. 2P-39B Boric Acid Makeup pump will trip when it is started.

Time	Position	Applicant's Actions or Behavior
	BOP	■**15. Isolate EFW pump 2P7A Steam supply as follows:** A. Close Main Steam Supply valve to 2P7A from leaking SG: • 2CV-1000-1 • 2CV-1050-2
	SRO	B. Refer to TS 3.7.1.2, Emergency Feedwater System. **Examiner Note: The SRO must enter TS 3.7.1.2 when the Main steam supply valve to 2P-7A is closed.**
	ANY	16. Check SG Blowdown aligned to SU/BD DI.
Cue: If requested as NLO for S/G blowdown alignment then, report S/G blowdown is aligned to SU/BD DI		
	SRO	*21. IF confirmed primary to secondary leakage on ANY SG quantified to meet ANY of the following: • > 75 gpd (.052 gpm) AND rate of leak rise is > 30 gpd/hr (.021 gpm) • Leak spike of >150 gpd (>0.1 gpm) • Leakage in any one SG that exceeds 100 gpd (0.07 gpm) during allowed 24 hour period of operation after ACTION LEVEL TWO entry. THEN perform ACTION LEVEL THREE section of Attachment A.
	SRO	Attachment A: ACTION LEVEL THREE A. IF leakage > 75 gpd (> 0.052 gpm) AND rising by > 30 gpd/hr, THEN perform the following as necessary: 1) IF at power, THEN commence power reduction as necessary to be < 50% power within one hour. 2) Be in Mode 3 within the next two hours. B. For all other cases concerning ACTION LEVEL THREE required entry, commence power reduction as necessary to be in Mode 3 within six hours. C. Ensure any out of service leak monitoring equipment returned to service as soon as practical.

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 3 & 4

Event Description: Shutdown required due to 4 gpm steam generator tube leak on 'A' steam generator. Tech Spec for SRO. 2P-39B Boric Acid Makeup pump will trip when it is started.

Time	Position	Applicant's Actions or Behavior
	ALL	22. IF required by Attachment A, THEN commence power reduction using 2102.004, Power Operations as follows: B. IF RCS leakage less than 10 gpm, THEN perform RCS boration using 2104.003, Chemical Addition, Exhibit 3, Normal RCS Boration at Power. **Examiners Note: The ATC should start a shutdown using 2104.003, Chemical Addition, Exhibit 3, Normal RCS Boration at power.**
2102.004 Power operations	SRO	**Examiner Note: Excerpt from Power Operations for power reduction.** 12.2 Commence Power reduction by performing the following as necessary: • Boration using Normal Borate Mode to Charging pump suction (unless directed otherwise by Abnormal Operating Procedure) Refer to Chemical Addition (2104.003), Exhibit 3, Normal RCS Boration at Power. • CEA insertion using CEDMCS Control System Operation (2105.009), Exhibit 3 CEDMCS Operations (normally for ASI control). * 12.3 Lower Turbine load as necessary to hold Tave within ± 2°F of program Tref using Exhibit 1, TAVE VS TREF. 12.5 IF Shutdown directed by TECH SPECS, THEN initiate ATTACHMENT L to determine mode specific time limits and continue with shutdown. **Examiner Note: The SRO should give attachment L to the Shift Manager to perform.**
Exhibit 3, Normal Boration at Power.	ATC	1.0 Verify Boric Acid Makeup Flow controller (2FIC-4926) set as follows: • In MANUAL OR AUTO. • Setpoint set to desired flowrate. 2.0. Verify desired BAM pump (2P-39A OR 2P-39B) selected for automatic operation using BAM pump Select switch (2HS-4911-2).

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 3 & 4

Event Description: Shutdown required due to 4 gpm steam generator tube leak on 'A' steam generator. Tech Spec for SRO. 2P-39B Boric Acid Makeup pump will trip when it is started.

Time	Position	Applicant's Actions or Behavior
Exhibit 3, Normal Boration at Power.	ATC	3.0 Operate Mode Select Switch (2HS-4928) as follows: 3.1 Place to BORATE. 3.2 Verify the following: • Charging Pump Suction From Boric Acid (2CV-4930) opens. • Selected BAM pump (2P-39A OR 2P-39B) running. **Examiner Note: When the Mode Select Switch is placed in the Borate position 2P-39B will start and then trip.**
	ATC	Recognize and report 2P-39B tripped after start.
Cue: If contacted as NLO, report the 2P-39B breaker 2B62-B6 breaker is trip free and 2P-39B motor has an acrid odor.		
	SRO	Direct another boration method i.e. 2P-39A preferred, gravity feed. **Examiner Note: gravity feed boration will not be available due to the VCT outlet valve not closing.**
Exhibit 3, Normal Boration at Power.	ATC	2.0. Verify desired BAM pump (2P -39A OR 2P -39B) selected for automatic operation using BAM pump Select switch (2HS-4911-2).

Op-Test No.: 2011-1	Scenario No.: 2	Event No.: 3 & 4

Event Description: Shutdown required due to 4 gpm steam generator tube leak on 'A' steam generator. Tech Spec for SRO. 2P-39B Boric Acid Makeup pump will trip when it is started.

Time	Position	Applicant's Actions or Behavior
Exhibit 3, Normal Boration at Power.	ATC	3.0 Operate Mode Select Switch (2HS-4928) as follows: 3.1 Place to BORATE. 3.2 Verify the following: • Charging Pump Suction From Boric Acid (2CV-4930) opens. • Selected BAM pump (2P-39A OR 2P-39B) running. **Examiner Note: Step 3 may not need to be performed again but the SRO may direct securing normal lineup prior to swapping BAM pumps** *4.0 IF additional boric acid flow required, THEN manually start additional BAM pump (2P-39A OR 2P-39B). *5.0 Verify BAM Tank Recirc Valve (2CV-4903-2 OR 2CV-4915-2) open for running pumps. 6.0 Operate Boric Acid Makeup Flow Batch controller (2FQIS-4926) as follows: 6.1 Depress Red pushbutton. 6.2 Verify 2FQIS-4926 set for desired quantity. 6.3 Verify 2FIC-4926 indicates desired flow rate. *7.0 Monitor the following parameters: • RCS Tave • Axial Shape Index • Reactor power
Examiner Note: The SRO may enter the TRM 3.1.2.2 for boration flow path or TRM 3.1.2.6 for 2P-39B if it is discovered that the VCT outlet valve 2CV-4873-1 will not close or if 2T-6A Boric acid tank level lowers below the limit.		
Termination Criteria: When reactivity manipulations are satisfied or at the discretion of the lead examiner.		

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Crew determines the leak rate has risen to >44gpm.
	ALL	■13. IF RCS leakage greater than 44 gpm AND in Mode 1 OR 2, THEN perform the following: A. Trip Reactor. B. Actuate SIAS. C. Actuate CCAS D. GO TO 2202.001, Standard Post Trip Actions.
	SRO	Enter and implement EOP 2202.001, Standard Post Trip Actions.
	SRO	1. Notify Control Board Operators to monitor safety functions using Exhibit 7, CBO Reactor Trip Checklist. 2. Open Safety Function Tracking page.
Reactivity control safety function	ATC	3. Check Reactivity Control established as follows: _____A. Reactor power lowering. _____B. ALL CEAs fully inserted by observing Rod bottom lights illuminated. **(Not met due to Event #6, perform contingency)**
Reactivity control safety function	SRO	Direct ATC to perform emergency boration in progress using Exhibit 1, Emergency Boration. _____B. Perform the following as necessary: _____1) Check CEACs 1 AND 2 indicates ALL CEAs fully inserted. **(Not met due to Event #6, perform contingency)** _____2) Verify emergency boration in progress using Exhibit 1, Emergency Boration.

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
Emergency Boration **Critical Task: Emergency Boration must be started prior to completion of SPTAs**	ATC	1. Select ONE of the following Emergency Boration flowpaths: **FLOWPATH** / **ACTIONS REQUIRED** A. Gravity Feed A. Verify at least ONE BAM Tank Gravity Feed valve open: • 2CV-4920-1 • 2CV-4921-1 B. BAM pumps B. 1) Start at least ONE BAM pump. 2) Open Emergency Borate valve (2CV-4916-2). 3) Verify Boric Acid Makeup Flow Control valve (2CV-4926) closed. C. RWT to Charging pumps C. Open Charging Pump Suction Source From RWT valve (2CV-4950-2). **Examiner Note: 2P-39A Boric Acid Makeup pump will be required to be used and should already be running.**
	ATC	2. Close VCT Outlet valve (2CV-4873-1). **Examiner Note: The VCT outlet valve will not close and ATC should perform step 3.**
	ATC	3. IF VCT Outlet valve does NOT close, THEN verify BAM Pumps Emergency Boration flowpath selected. **Examiner Note: The emergency borate valve 2CV-4916-2 will not automatically open and must be manually opened by ATC.**
	ATC	4. Verify Reactor Makeup Water Flow Control valve (2CV-4927) closed. 5. Verify at least ONE Charging pump running and charging header flow greater than 40 gpm.
	BOP	Complete Post Trip contingencies to align gland seal steam using 2CV-0233 Gland Seal Bypass Valve.

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
Vital Auxiliaries safety function	BOP	4. Check Maintenance of Vital Auxiliaries satisfied: A. Check Main Turbine tripped by BOTH of the following: • ALL Main Stop Valves closed. • Generator megawatts indicate zero. B. Generator Output breakers open. C. Exciter Field breaker open. D. At least ONE 6900v AC bus energized E. At least ONE 4160v Non-vital AC bus energized. F. BOTH 4160v Vital AC buses energized. G. BOTH DGs secured. **Both DGs will be running with service water aligned**) H. At least ONE 125v Vital DC bus energized: 2D01 - SPDS point E2D01 2D02 - SPDS point E2D02
RCS Inventory Control Safety function	ATC	5. Check RCS Inventory Control established as follows: A. PZR level: • 10 to 80%. • Trending to setpoint. **(Will not be met due to SGTR Event #5 perform contingency)** B. RCS MTS 30°F or greater.
RCS Inventory Control Safety function	SRO	Direct the following as necessary: A. Perform as necessary: 1) IF SIAS actuated on PPS inserts, THEN **GO TO** Step 6. 2) Verify PZR Level Control system restoring level to setpoint.

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
RCS Pressure Control Safety function	BOP	6. Check RCS Pressure Control: — • 1800 to 2250 psia. — • Trending to setpoint. **(Not met due to SGTR Event #5, perform contingency)**
RCS Pressure Control Safety function	SRO	Direct the following actions as necessary: 6. Perform as necessary: A. IF RCS pressure lowers to less than 1400 psia, THEN trip ONE RCP in EACH loop. D. IF RCP 2P32A or 2P32B stopped, THEN verify associated PZR Spray valve in MANUAL and closed. E. IF RCS pressure lowers to 1650 psia or less, THEN perform the following: 1) Verify SIAS actuated on PPS inserts. 2) **GO TO** Step 7. F. Verify PZR Pressure Control system restoring pressure to setpoint.
Core Heat Removal safety function.	ATC	7. Check Core Heat Removal by forced circulation: A. At least ONE RCP running. B. CCW flow aligned to RCPs. C. Loop delta T less than 10°F. D. RCS MTS 30°F or greater. E. Check SW aligned to CCW. **(SW will not be aligned due to SIAS and should perform contingency)** F. IF SIAS or MSIS actuated, THEN maintain SW header pressure greater than 85 psig.
	SRO	Direct the contingency for step 7. E

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
	BOP	E. IF CCW available, THEN restore SW to CCW, refer to 2202.010 Exhibit 5, CCW/ACW/SW Alignment. **Examiner Note: The SRO may decide to pull up the step to align SW to ACW to maintain condenser vacuum pump working properly.**
RCS Heat Removal Safety Function	BOP/ATC	8. Check RCS Heat Removal: A. Check SG available by BOTH of the following: • At least ONE SG level 10 to 90%. • FW maintaining SG level B. Check MFW in RTO **(MFW may not be in RTO due to steam generator levels being at setpoint, and the contingencies are satisfied if steam generator levels are controlling near the setpoint)** C. Check Feedwater line intact by the following: • SG level stable or rising. • NO unexplained step changes or erratic FW flow. • NO unexplained step changes or erratic Condensate flow. D. Check SG pressure 950 to 1050 psia. E. IF desired, THEN perform the following for SDBCS Master Controller using 2105.008 Exhibit 3: 1) Place controller in Auto/Local. 2) Set setpoint at 960 psia. F. Check RCS TC 540 to 555°F.

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
Containment Safety Function	ANY	9. Check CNTMT parameters: A. Temperature and Pressure: • Temperature less than 140°F. • Pressure less than 16 psia. B. Check CNTMT Spray pumps secured. C. NO CNTMT radiation alarms or unexplained rise in activity: 1) CAMS alarms: • "CNTMT PART/GAS RAD HI/LO" annunciator (2K10-B6) clear. 2) RCS leakage alarms: • "AREA RADIATION HI/LO" annunciator (2K11-B10) clear. • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. 3) Check the following radiation monitors trend stable: • CNTMT Area • CAMS • Process Liquid D. NO secondary system radiation alarms or unexplained rise in activity: **(Not met due to SGTR Event #5)** 1) "SEC SYS RADIATION HI" annunciator (2K11-A10) clear. 2) Secondary Systems Radiation monitors trend stable: • Main Steam lines • SG Sample • Condenser Off Gas

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
	SRO	10. Notify STA to report to control room. 11. Verify NLOs informed of Reactor trip. 12. Verify Reactor trip announced on Plant page. 13. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
	SRO	14. Direct control board operators to acknowledge ALL annunciators and announce ALL significant alarms.
	SRO	15. Check ALL safety function acceptance criteria satisfied. **(All safety functions are not satisfied, perform contingency)** 15. IF ANY safety function acceptance criteria NOT satisfied, THEN perform the following: A. Notify control room staff of safety functions NOT satisfied. B. GO TO Exhibit 8, Diagnostic Actions.
	SRO	Diagnose Steam Generator Tube Rupture EOP 2202.004
	SRO	Enter and implement Steam Generator Tube Rupture EOP 2202.004
	SRO	* 1. Confirm diagnosis of SGTR: A. Check SFSC acceptance criteria satisfied every 15 minutes. B. Refer to 2202.010 Attachment 20, Break Identification Chart. C. Verify SG Sample valves open. D. Notify Chemistry to perform BOTH of the following: • Sample BOTH SGs for activity. • Monitor RDACS for off site dose releases.
Cue: When contacted as Chemistry, then report you will sample both S/G for activity and Monitor RDACS for off site dose releases.		
	SRO	* 2. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
	SRO	3. Open Placekeeping Page.

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
	SRO	4. Record present time: • Time _____
	ANY	5. Verify SIAS and CCAS actuated on PPS inserts.
	SRO	6. Notify Control Board Operators to perform the following: A. Monitor floating steps. B. Verify actuated ESFAS components using 2202.010, Exhibit 9, ESFAS Actuation.
	ANY	*7. Check CCW aligned to RCPs.
	SRO	May elect to pull up the floating step for commencing a cooldown. Step 12. It is possible that the SRO will implement step 12 at the same time he implements step 8.
	ATC	■12. Commence RCS cooldown to less than 535°F TH as follows: A. Reset Low SG Pressure setpoints during cooldown and depressurization. B. Commence RCS depressurization to maintain RCS MTS 30 to 45°F. C. Monitor cooldown rate as follows: • Record RCS T_C and PZR temperature using Attachment 8, RCS Cooldown Table. • Plot RCS pressure versus RCS T_C using 2202.010 Attachment 1, P-T Limits every 15 minutes. D. IF ANY RCPs running, THEN initiate RCS cooldown using EITHER of the following: 1) SDBCS Bypass valves (condenser available) – most preferred. 2) SDBCS ADV from intact SG to atmosphere – least preferred • IF necessary, THEN supplement with SDBCS ADV from ruptured SG to atmosphere as needed. **Examiner Note: The SDBCS Bypass valves should be used to minimize off site release.**

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
	ANY	F. IF SDBCS Bypass valves available for RCS cooldown, THEN place ALL ADV Permissive switches in OFF.
	BOP	G. Control S/G levels with EFW or AFW using 2106.006, Emergency Feedwater System Operations.
	ANY	H. Secure running MFW pump.
	BOP	I. Close ALL MFW Block valves.
	ANY	■8. Restore ESF/Non-ESF systems post-SIAS as follows: A. Verify at least ONE SW pump running on EACH loop.
	ANY	B. Verify DG SW Outlet valves open.
	ANY	C. Verify SW pump suction aligned to Lake.
	ANY	D. Check 4160v Non-vital bus 2A1 or 2A2 energized from offsite power.
	ANY	E. Check 4160v Vital buses 2A3 AND 2A4 energized from offsite power.
	BOP	F. Start SW pumps as needed to maintain SW header pressure.
	ANY	G. Check SW to CCW restored.
	ANY	H. Check ACW restored. **(Not met, perform contingency)**
	BOP	H. Restore SW to ACW, refer to 2202.010 Exhibit 5, CCW/ACW/SW Alignment.
	BOP	I. Maintain SW header pressure greater than 85 psig.
	ANY	*9. Verify Safety Injection flow to RCS as follows: A. Check total HPSI flow acceptable using 2202.010 Exhibit 2, HPSI Flow Curve. B. Check total LPSI flow acceptable using 2202.010 Exhibit 3, LPSI Flow Curve. **Examiner Note: will not be met see event #7 actions**
	ANY	■10. Check RCS pressure greater than 1400 psia. **(May not be met, if not met perform contingency)**

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
	ANY	■10. Perform the following: (Contingency) A. IF RCS pressure less than 1400 psia, THEN perform the following: 1) Verify maximum of ONE RCP running in EACH loop. 2) IF RCP 2P32A or 2P32B stopped, THEN verify associated PZR Spray valve in MANUAL and closed. B. IF NPSH requirements violated OR RCS MTS less than 30°F, THEN perform the following: 1) Stop ALL RCPs. 2) Verify BOTH PZR Spray valves in MANUAL and closed.
	ANY	■11. Check IA pressure greater than 65 psig.
	ANY	*13. Minimize primary to secondary break flow as follows: A. Check ANY RCP running. B. Maintain RCS pressure within the following criteria: • Within 100 psia above minimum RCP NPSH requirement, refer to 2202.010 Attachment 1, P-T Limits. • Less than 1000 psia as conditions allow. • Within 50 psi of ruptured SG pressure as RCP NPSH requirements allow. **Examiners Note: The criteria to minimize break flow can not be established until HPSI is overridden. Then the crew should establish these limits.**

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
	ANY	C. Use EITHER of the following to depressurize RCS: 1) 2202.010 Attachment 27, PZR Spray Operation. 2) IF HPSI termination criteria met, THEN cycle Charging pumps or throttle HPSI flow to lower PZR pressure.
	ANY	D. IF RCS pressure less than ruptured SG pressure, THEN sample RCS Boron concentration every 30 minutes.
	ANY	14. Determine ruptured SG by comparing ANY of the following: A. Secondary Systems Radiation Trend recorder (2RR-1057). B. Main Steam Line Radiation Monitors: • 2RI-1007 • 2RI-1057 C. SG Sample Radiation Monitors: • 2RITS-5854 • 2RITS-5864 D. SG Tube Leak N-16 Monitor history trends. E. SG levels. 1) Level rising faster in ONE SG with similar FW flow rates and steaming rates in BOTH SGs. 2) Rising SG level with ALL FW isolated. F. Steam flow and FW flow prior to Reactor trip. G. SG water sample results.

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
	ANY	Direct the NLO's to perform the following: 15. Minimize secondary contamination by performing BOTH of the following: A. Commence isolation of ruptured SG by performing local actions ONLY of 2202.010 Attachment 10, SG Isolation. B. 2202.010 Attachment 19, Control of Secondary Contamination. **Examiner Note: Standard Att. 19 should already be started and may not be communicated again to NLOs.**
Cue: If contacted as the AO, then report after 5 min that the local portions of Attachment 10 for 'A' S/G are complete.		
	ANY	16. Isolate ruptured SG Steam Supply to EFW pump 2P7A as follows:
	ANY	A. Verify EFW pump 2P7B running. B. IF 2P7B NOT running, THEN verify AFW pump 2P75 running.
	ANY	C. Stop EFW pump 2P7A: 1) Override and close Steam Supply to 2P7A valve (2CV-0340-2). 2) Close Main Steam Supply valve from ruptured SG to EFW pump 2P7A: • "SG A TO EMER FW PMP TURB" 2CV-1000-1 • "SG B TO EMER FW PMP TURB" 2CV-1050-2

Op-Test No.: 2011-1	Scenario No.: 2	Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
	ALL	19. Isolate ruptured SG as follows: A. Monitor RCS TH during cooldown with ANY of the following: • PMS point T4614 • PMS point T4714 • SPDS display B. WHEN RCS TH less than 535°F, THEN isolate ruptured SG using 2202.010 Attachment 10, SG Isolation. C. Maintain ruptured SG less than 1050 psia with ONE of the following: • MSIV Bypass valve • Upstream ADV

Op-Test No.: 2011-1 Scenario No.: 2 Event No.: 5 & 6

'A' Steam Generator tube leakage ramps up to 200 gpm over 5 minutes. Manual reactor trip criteria when greater than 44 gpm.

Control Element Assembly #35 remains fully withdrawn when the reactor trips. The VCT outlet will not close and the emergency borate valve will not automatically open.

Time	Position	Applicant's Actions or Behavior
CRITICAL TASK Control Room actions for 2202.010 Standard Attachment 10	BOP	2. Verify each component in the following table in the indicated position:

COMPONENT DESCRIPTION	1.0 NUMBER	2.0 LOCATION	3.0 POSITION	√
ADV UPSTRM ISOL	2CV-1002*	2C02	CLOSED (1)	
2CV-1001 PERMISSIVE	2CV-1001	2C02	OFF (1)	
MSIV HEADER #1	2SV-1010-1 A	2C17	CLOSED	
MSIV HEADER #1	2SV-1010-2 A	2C16	CLOSED	
MSIV HEADER #1 BYP	2CV-1040-1	2C17	CLOSED (1)	
MAIN STEAM TO EFWP TURB 2K03	2CV-1000-1	2C17	CLOSED	
FEEDWATER BLOCK VALVE TO SG-A	2CV-1024-1	2C17	CLOSED	
FEEDWATER BLOCK VALVE TO SG-A	2CV-1023-2	2C16	CLOSED	
SG BLOWDOWN ISOLATION	2CV-1016-1	2C17	CLOSED (1)	
2P7B DISCHARGE TO SG-A	2CV-1038-2 *	2C17	CLOSED (1)	
FLOW CONTROL VALVE TO SG-A	2CV-1025-1 *	2C17	CLOSED (1)	
SAMPLE ISOLATION VALVE SG-A	2CV-5850	2C17	CLOSED (1)	
2P7A DISCHARGE TO SG-A	2CV-1026-2 *	2C16	CLOSED (1)	
2P7A DISCHARGE TO SG-A	2CV-1037-1 *	2C16	CLOSED (1)	
SAMPLE ISOLATION VALVE STEAM GEN A	2CV-5852-2 *	2C16	CLOSED (1)	

* Denotes override capability.

NOTE #1: Valves may be open at SM/CRS discretion.

Examiner Note: 2202.010 Attachment 10 local and control room actions must be complete within 30 minutes of entering the Steam Generator Tube Rupture EOP.

Termination criteria: RCS Cool down to less than 535°F Th and 'A' SG isolated or at the discretion of the lead examiner.

Op-Test No.: 2011-1	Scenario No.: 2	Event No.: 7
Event Description: 2CV-5017-1, 2CV-5015-1 Low pressure safety injection (LPSI) and High pressure safety injection valves (HPSI) fail to open and the "B" HPSI pump trips due to motor overload.		

Time	Position	Applicant's Actions or Behavior
	ANY	Report that 2P-89B High pressure safety injection pump has tripped.
	ANY	Dispatch NLO to investigate 2P-89B breaker for overcurrent drop flags and to investigate 2P-89B locally
Cue: If asked, report that the over current relays for 2P-89B High Pressure Safety Injection pump are dropped. **Cue: If asked, report that 2P-89B High Pressure Safety Injection pump looks normal locally.**		
	ANY	Report that 2CV-5017-1, and 2CV-5015-1 did not open during SIAS
	SRO	Direct BOP to place 2CV-5017-1 and 2CV-5015-1 in their actuated positions **Examiner Note: The SRO may direct the BOP to use Standard Attachment's Exhibit 2 or Standard Attachment's Exhibit 9 to verify actuated components. Both exhibits are directed from 2202.004 Steam Generator Tube rupture.**
CRITICAL TASK	BOP	Open 2CV-5017-1 and 2CV-5015-1 to establish minimum design safety injection flow. **Examiner Note: Critical portion is 2CV-5015-1 HPSI valve must be opened before the completion of 2202.010 Exhibit 2, HPSI Flow Curve.**
Examiner Note: The SRO may discuss Tech Spec 3.5.2 or 3.5.3 due to failure of 2P-89B, 2CV-5015-1, and 2CV-5017-1.		
Termination criteria: When 2CV-5015-1 HPSI valve has been fully opened or at examiner's discretion.		