Facility: Arkansas Nuclear One Unit 2	Date of Examination: 08/24/2015
Examination Level: RO X SRO ☐	Operating Test Number: 2015-1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
A1. Conduct of Operations 2.1.23 RO (4.3)	D/R	Determine CEA#1 Upper Gripper Coil Temperature ANO-2-JPM-NRC-ADMIN-XTCEA
A2. Conduct of Operations 2.1.25 RO (3.9)	N/R	Determine time to start CNTMT evacuation and closure ANO-2-JPM-NRC-ADMIN-CNTMT2
A3. Equipment Control 2.2.12 RO (3.7)	D/P/R	Evaluate Containment Atmospheric Conditions. ANO-2-JPM-NRC-ADMIN-CNTMT
A4. Radiation Control 2.3.15 RO (2.9)	M/R	Determine condenser off gas radiation monitor setting. ANO-2-JPM-NRC-ADMIN-CRADMON
Emergency Plan		

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

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

Facility: Arkansas Nuclear One Unit 2		Date of Examination: 08/24/2015
Examination Level: RO ☐ SRO X		Operating Test Number: 2015-1
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
A5. Conduct of Operations 2.1.5 SRO (3.9)	N/R	Determine which operators are available for call out. ANO-2-JPM-NRC-ADMIN-WORK
A6. Conduct of Operations 2.1.40 SRO (3.9)	D/P/R	Determine Shutdown Operations Protection Plan Condition ANO-2-JPM-NRC-ADMIN-SOPP1
A7. Equipment Control 2.2.40 SRO (4.7)	M/R	Verify RPS trip set point determination for inoperable MSSV ANO-2-JPM-NRC-ADMIN-MSSVINOP
A8. Radiation Control 2.3.4 SRO (3.7)	D/R	Calculate expected dose for Re-entry during an emergency and determine if entry is allowed. ANO-2-JPM-NRC-ADMIN-EMGRESPSRO
A9. Emergency Plan 2.4.44 SRO (4.4)	M/R	Determine protective action recommendations ANO-2-JPM-NRC-ADMIN-PAR2

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

* 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 #: 01 DATE: ____________

SYSTEM/DUTY AREA: Control Element Drive Mechanism Control System

TASK: Determine CEA#1 Upper Gripper Coil Temperature

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

Alternate Path Yes: ________ No: X Time Critical Yes: ________ X

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

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: ____________ Classroom: Perform

POSITION EVALUATED: RO: ____________ SRO: ____________

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

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 ________

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

Plant is at full power.

Both Main Chillers have tripped and cannot be started.

I&C is not available to obtain CEDM Coil temperatures.

OP 2203.012M, 2K13 ACA, for window C4, CEDM Cooling coils Water Flow Low is in alarm.

CEA #1 is not on the Hold Bus.

Readings obtained from the CEDM coil using a calibrated DVM are:

- Upper Gripper coil voltage (Terminals #4 and #5 on TBC4C6) is equal to 44V.
- Upper Gripper shunt voltage (across pins “C” and “D”) is equal to 7.12 mV.

TASK STANDARD:

Calculated CEA #01 coil amperage, resistance and determined coil temperature to be ≥400.042°F and ≤420.043°F.

TASK PERFORMANCE AIDS:

1. OP-2105.009 Exhibit 2
2. Calculator

EXAMINER NOTES:

OP-2105.009 should be completed up to step 4.3.1.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM directs, "As directed by OP 2203.012M, 2K13-C4, CEDM Cooling coils Water Flow Low ACA, calculate the Upper Gripper temperature for CEA 01 using 2105.009, Exhibit 2."

START TIME: _______________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
Examiner's Cue: **OP-2105.009 Exhibit 2 should be completed up to step 4.3.1 (with values filled in).**				
(C)	1. (Step 5)	Utilize ohms law to calculate coil current (Icoil) as follows. (Icoil) = (Vshunt) ______V ÷ .002 ohms. (Icoil) = ______ amps	Examinee calculated current to be between 3.56 to 3.6 amps.	N/A SAT UNSAT
(C)	2. (Steps 6 and 6.1)	Calculate coil resistance (Rcoil1) as follows: (Rcoil1) = (Vug)______V ÷ (Icoil) ______ amps (Rcoil1) = ______ ohms	Examinee calculated resistance of the coil to be between 12.2 and 12.36 ohms.	N/A SAT UNSAT
Procedure 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.				
(C)	3. (Steps 6.2 and 6.3)	(Rcoil2) = ______(Rcoil1) - .525 ohms(CEA #01 lead resistance). (Rcoil2) = ______ ohms	Examinee calculated resistance of the $Rcoil_2$ to be between 11.675 and 11.835 ohms.	N/A SAT UNSAT
(C)	4. (Steps 7.0 and 7.1)	Obtain CEA #01 coil temperature as follows: Use the following to obtain CEA #01 coil temperature: • Coil resistance (Rcoil2) calculated in step 6.0 • Table below	Examinee calculated correct CEA 01 upper gripper coil temperature to be 413.376°F. **Acceptable range (≥400.042°F and ≤ 420.043°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 is not available to obtain CEDM Coil temperatures.
- OP 2203.012M, 2K13 ACA, for window C4, CEDM Cooling coils Water Flow Low is in alarm.
- CEA #1 is not on the Hold Bus.
- Readings obtained from the CEDM coil using a calibrated DVM are:
  - Upper Gripper coil voltage (Terminals #4 and #5 on TBC4C6) is equal to 44V.
  - Upper Gripper shunt voltage (across pins "C" and "D") is equal to 7.12 mV.

INITIATING CUE:

The CRS directs you to calculate the Upper Gripper temperature for CEA 01 using 2105.009, Exhibit 2 starting with step 5. Table interpolation not required.

Acceptable Temperature Range: (≥400.042°F and ≤ 420.043°F)

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 is not available to obtain CEDM Coil temperatures.
- OP 2203.012M, 2K13 ACA, for window C4, CEDM Cooling coils Water Flow Low is in alarm.
- CEA #1 is not on the Hold Bus.
- Readings obtained from the CEDM coil using a calibrated DVM are:
  - Upper Gripper coil voltage (Terminals #4 and #5 on TBC4C6) is equal to 44V.
  - Upper Gripper shunt voltage (across pins "C" and "D") is equal to 7.12 mV.

INITIATING CUE:

The CRS directs you to calculate the Upper Gripper temperature for CEA 01 using 2105.009, Exhibit 2 starting with step 5. Table interpolation not required.

Exhibit provides Operations 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 = 7.12 mV

Convert mV to Volts: 7.12 mV X $\frac{1\ V}{1000\ mV}$ = 0.00712 V

Record (V_{shunt}) = 0.00712 V

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

5.0 Utilize ohms law to calculate coil current (I_{coil}) as follows.

5.1 (I_{coil}) = (V_{shunt}) ______V ÷ .002 ohms.

5.2 (I_{coil}) = ______ amps

6.0 Calculate coil resistance (R_{coil_1}) as follows:

6.1 (R_{coil_1}) = (V_{ug})______V ÷ (I_{coil}) ______ amps

(R_{coil_1}) = ______ 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 (R_{coil_2}) = ______(R_{coil_1}) - .525 ohms(CEA #01 lead resistance).

6.3 (R_{coil_2}) = ______ ohms

7.0 Obtain CEA #01 coil temperature as follows:

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

- Coil resistance (R_{coil_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.**

KEY

Exhibit provides Operations 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 = 7.12 mV

Convert mV to Volts: 7.12 mV X $\frac{1\ V}{1000\ mV}$ = 0.00712 V

Record (V_{shunt}) = 0.00712 V

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

5.0 Utilize ohms law to calculate coil current (I_{coil}) as follows.

5.1 (I_{coil}) = (V_{shunt}) 0.00712 V ÷ .002 ohms.

5.2 (I_{coil}) = 3.56 to 3.6 amps

6.0 Calculate coil resistance (R_{coil_1}) as follows:

6.1 (R_{coil_1}) = (V_{ug}) 44 V ÷ (I_{coil}) 3.56 to 3.6 amps

(R_{coil_1}) = 12.2 to 12.36 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 (R_{coil_2}) = 12.2 to 12.36 (R_{coil_1}) - .525 ohms(CEA #01 lead resistance).

6.3 (R_{coil_2}) = 11.675 to 11.835 ohms

7.0 Obtain CEA #01 coil temperature as follows:

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

- Coil resistance (R_{coil_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 #: 002 DATE: ____________

SYSTEM/DUTY AREA: Conduct of Operations

TASK: Determine time to start CNTMT evacuation and closure

JTA#: ANO2-RO-EOPAOP-OFFNORM-186

Alternate Path Yes: ____ No: X Time Critical Yes: ____ No: X

KA VALUE RO: 3.9 SRO: 4.2 KA REFERENCE: 2.1.25

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: X SRO: ____

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

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 10 Minutes

REFERENCE(S): OP-2202.010, Standard Attachment 32, Containment Evacuation Checklist

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 ________

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

Plant is in Mode 5 in preps for a refueling outage.

RCPs are secured and not available.

Shutdown Cooling is lost at 0605 today.

CET's and RVLMS ATS are operable.

RCS conditions @ 605 after SDC was lost:

- RCS CET temperature is 172 ^{0}F
- RCS pressure is 240 psia
- PZR level is 41%
- RCS heatup rate is 4.33 degrees per minute.

TASK STANDARD:

Determined Saturation temperature the RCS pressure to be between 397.405 and 397 ^{0}F

Determined time to boil to be between 51to 52.1 minutes.

Determined time to start containment evacuation between 0626 and 0627.1

TASK PERFORMANCE AIDS:

OP 2202.010 Standard Attachments, Attachment 32, Containment Evacuation Checklist.

Steam tables.

SIMULATOR SETUP:

NA

EXAMINER'S NOTES:

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs you to determine time to start CNTMT evacuation and closure using OP 2202.010, Standard Attachment 32, by performing step 2.

Start Time: ________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
Procedure Note: CETs and ATS will NOT be operable with Reactor Vessel Head removed.				
	1. (Step 2.A)	Determine time to start CNTMT evacuation and closure as follows: A. IF RCS in reduced inventory AND CETs NOT available, THEN perform the following:	Examinee determined Step is not applicable.	N/A SAT UNSAT
	2. (Step 2.B.1)	IF CETs or RVLMS ATS operable, THEN determine time to boiling as follows: 1) Determine and record RCS heatup rate. __________F/min heatup rate	Examinee documented the heatup rate give in the initial conditions.	N/A SAT UNSAT
(C)	3. (Step 2.B.2)	2) Determine and record saturation temperature using steam tables and present RCS pressure. __________F saturation temperature (T_{SAT})	Using the steam tables and current RCS pressure Examinee determined that the staturation temperature for 240 psia is between 397.405 ^{0}F and 397 ^{0}F	N/A SAT UNSAT
(C)	4. (Step 2.B.3)	3) Solve for time to boiling: {TSAT} - {RCS temp} _________________= time to boiling {t3} {heatup rate} {_____F} - {_____F} = ________ minutes { F/min}	Examinee calculated the time to boiling to be between 52.1 and 51 min.	N/A SAT UNSAT
	5. (Step 2.B.4)	4) Record time to boil (t3) in step 2.E.	Examinee recorded time calculated in step 2.B.3 in step 2.E.	N/A SAT UNSAT
	6. (Step 2.C)	C. Record time SDC was lost {t1}.	Examinee recorded time from initial conditions in step 2.E.	N/A SAT UNSAT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	7. (Step 2.D)	D. IF time to boiling can NOT be calculated, THEN record time to boil (t3) from Control Room logs in Step 2.E.	Examinee determined step is not applicable.	N/A SAT UNSAT
(C)	8. (Step 2.E)	E. Calculate time to start CNTMT evacuation and closure as follows: { t1 } + [{ t3 } - 30 minutes] = { time to start Step 5 } _______ + [_______ - 30 minutes] = _______ .	Examinee calculated to time to start CNTMT evacuation and closure to be between 0627.1 and 0626.	N/A SAT UNSAT
END				

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

Plant is in Mode 5 in preps for a refueling outage.

RCPs are secured and not available.

Shutdown Cooling is lost at 0605.

Current time is 0610.

CET's and RVLMS ATS are operable.

RCS conditions @ 605 after SDC was lost:

- RCS temperature = 172 ^{0}F
- RCS pressure is 240 psia
- PZR level is 41%
- RCS heatup rate is 4.33 degrees per minute.

INITIATING CUE:

The SM/CRS directs you to determine time to start CNTMT evacuation and closure using OP 2202.010, Standard Attachment 32, by performing step 2.

Time to Start evacuation and closure:__________627.1 to 626.0______________________

EXAMINEE'S COPY

INITIAL CONDITIONS:

Plant is in Mode 5 in preps for a refueling outage.

RCPs are secured and not available.

Shutdown Cooling is lost at 0605.

Current time is 0610.

CET's and RVLMS ATS are operable.

RCS conditions @ 605 after SDC was lost:

- RCS temperature = 172 ^{0}F
- RCS pressure is 240 psia
- PZR level is 41%
- RCS heatup rate is 4.33 degrees per minute.

INITIATING CUE:

The SM/CRS directs you to determine time to start CNTMT evacuation and closure using OP 2202.010, Standard Attachment 32, by performing step 2.

Time to Start evacuation and closure:____

1. IF Outage Desk manned,
   THEN notify Shift Outage Manager of the condition.

2. Determine time to start CNTMT evacuation and closure as follows:

NOTE
CETs and ATS will NOT be operable with Reactor Vessel Head removed.

   A. IF RCS in reduced inventory AND CETs NOT available,
      THEN perform the following:

      1) Verify CNTMT purge secured using 2104.033, Containment Atmosphere Control.

      2) GO TO Step 5.B of this Attachment AND initiate CNTMT evacuation and closure.

   B. IF CETs or RVLMS ATS operable,
      THEN determine time to boiling as follows:

      1) Determine and record RCS heatup rate.

         ___________ F/min
         heatup rate

      2) Determine and record saturation temperature using steam tables and present RCS pressure.

         ___________ F
         saturation temperature (T_{SAT})

      3) Solve for time to boiling:

         $$\frac{\{T_{SAT}\} - \{RCS\ temp\}}{\{heatup\ rate\}} = \text{time to boiling } \{t3\}$$

         $$\frac{\{\_\_\_\_ F\} - \{\_\_\_\_ F\}}{\{\_\_\_\_\_\_\_\_ F/min\}} = \_\_\_\_\_\_\_\_\_\_ \text{ minutes}$$

      4) Record time to boil (t3) in step 2.E.

(Step 2 continued on next page)

2. (continued)

C. Record time SDC was lost {t1}.

D. IF time to boiling can NOT be calculated,
THEN record time to boil (t3) from Control Room logs in Step 2.E.

E. Calculate time to start CNTMT evacuation and closure as follows:

{ t1 } + [{ t3 } - 30 minutes] = { time to start Step 5 }

________ + [________ - 30 minutes] = ________.

3. Verify CNTMT purge/ventilation secured using 2104.033, Containment Atmosphere Control.

4. WHEN RCS temperature greater than 180°F,
THEN perform the following:

A. Locally verify "RWT RECIRC AND TEST LINE" valve (2BS-26) open.

B. Place ONE HPSI pump handswitch in NORMAL AFTER STOP.

C. WHEN RCS temperature greater than 195°F,
THEN verify the following on PPS inserts:

1) HI/LO SG Level Bypass Permissive lights extinguished.

2) IF HI/LO SG Bypass Permissive lights do NOT extinguish,
THEN place associated handswitch in NORMAL.

3) Verify NORMAL lights are ON.

4) Verify at least 3 channels operable.

NOTE

The following are examples of events where SDC may NOT be able to be restored.

- A rupture exists in the SDC system that would prevent SDC from being returned to service.
- No SDC pumps available due to equipment or electrical failure.
- SDC suction line valves can NOT be opened by any means.
- SW flow can NOT be established to at least ONE SDC HX.

5. IF time to start CNTMT evacuation and closure reached OR SDC can NOT be restored, THEN perform the following:

   A. Obtain SM concurrence for CNTMT evacuation and closure.

   B. Perform 1015.008, Attachment F, Setting Containment Closure.

   C. IF Refueling Canal empty OR RCS level lowering, THEN locally perform the following:

      1) Verify Traveling Sheave Assembly retrieved, refer to 2503.003, Operation of Fuel Handling Equipment.

      2) Verify "FUEL TRANSFER TUBE" valve (2CV-5432) closed.

   D. Notify Radiation Protection to evacuate CNTMT of all personnel NOT involved with CNTMT closure.

   E. Make the following announcement on Plant Page system:

Attention all personnel. Attention all personnel. A Unit 2 CNTMT evacuation is required. All personnel except those performing CNTMT closure evacuate CNTMT.

   F. Actuate CNTMT Evacuation alarm on 2C22.

   G. Repeat Steps 5.E and F one time.

   H. Attempt to establish CNTMT cooling using 2104.033, Containment Atmosphere Control.

   I. IF CNTMT coolers operating, THEN verify chilled water or Service Water aligned to CNTMT coolers.

KEY

ATTACHMENT 32
CNTMT EVACUATION CHECKLIST

1. IF Outage Desk manned,
   THEN notify Shift Outage Manager of the condition.

2. Determine time to start CNTMT evacuation and closure as follows:

NOTE
CETs and ATS will NOT be operable with Reactor Vessel Head removed.

A. IF RCS in reduced inventory AND CETs NOT available,
THEN perform the following:

1) Verify CNTMT purge secured using 2104.033, Containment Atmosphere Control.

2) GO TO Step 5.B of this Attachment AND initiate CNTMT evacuation and closure.

B. IF CETs or RVLMS ATS operable,
THEN determine time to boiling as follows:

1) Determine and record RCS heatup rate.

4.33 F/min
heatup rate

2) Determine and record saturation temperature using steam tables and present RCS pressure.

397.405 to 397 F
saturation temperature (T_{SAT})

3) Solve for time to boiling:

$$\frac{\{T_{SAT}\} - \{\text{RCS temp}\}}{\{\text{heatup rate}\}} = \text{time to boiling } \{t3\}$$

$$\frac{\{397.405 \text{ to } 397 \text{ F}\} - \{172 \text{ F}\}}{\{4.33 \text{ F/min}\}} = 51 \text{ to } 52.1 \text{ minutes}$$

4) Record time to boil (t3) in step 2.E.

(Step 2 continued on next page)

ATTACHMENT 32
CNTMT EVACUATION CHECKLIST

2. (continued)

C. Record time SDC was lost {t1}.

D. IF time to boiling can NOT be calculated,
THEN record time to boil (t3) from Control Room logs in Step 2.E.

E. Calculate time to start CNTMT evacuation and closure as follows:

{ t1 } + [{ t3 } - 30 minutes] = { time to start Step 5 }

0605 + [52.1 to 51 - 30 minutes] = 0627.1 to 0626.

3. Verify CNTMT purge/ventilation secured using 2104.033, Containment Atmosphere Control.

4. WHEN RCS temperature greater than 180°F,
THEN perform the following:

A. Locally verify "RWT RECIRC AND TEST LINE" valve (2BS-26) open.

B. Place ONE HPSI pump handswitch in NORMAL AFTER STOP.

C. WHEN RCS temperature greater than 195°F,
THEN verify the following on PPS inserts:

1) HI/LO SG Level Bypass Permissive lights extinguished.

2) IF HI/LO SG Bypass Permissive lights do NOT extinguish,
THEN place associated handswitch in NORMAL.

3) Verify NORMAL lights are ON.

4) Verify at least 3 channels operable.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 003 DATE: ______

SYSTEM/DUTY AREA: Conduct of Operations

TASK: Evaluate Containment Atmospheric Conditions

JTA#: ANO2-RO-CVENT-NORM-7

Alternate Path Yes: ____ No: X Time Critical Yes: ____ No: X

KA VALUE RO: 3.7 SRO: 4.1 KA REFERENCE: 2.2.12

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: X SRO: ____

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

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 10 Minutes

REFERENCE(S): OP-2104.033, Containment Atmosphere Control

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 ____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

Plant is in Mode 1.

PMS printer is broken and TS surveillance 4.4.6.1 needs to be completed.

The following values were recorded from PMS:

- T5605-5 is 130.57 degrees F
- T5606-6 is not available
- P5601-1 is 14.02 psia
- P5602-2 is 13.95 psia
- P5603-3 is 14.01 psia
- P5604-4 is 14.16 psia

TASK STANDARD:

Determined that Containment Temperature and Pressure are not in the acceptable region of operation.

Calculated Containment Temperature was 134.5 to 135 F.

Calculated Average Containment Pressure was 14.0 to 14.03 psia.

TASK PERFORMANCE AIDS:

OP 2104.033 Containment Atmosphere Control, Supplement 4, Containment Atmospheric Conditions Using Computer

SIMULATOR SETUP:

NA

EXAMINER'S NOTES:

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs you to perform an evaluation of containment atmospheric conditions using OP 2104.033, Containment Atmosphere Control, Supplement 4.

Start Time: ________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1.	Record containment temperature.	Recorded containment temperature readings in OP 2104.033 Supplement 4 Step 2.1.	N/A SAT UNSAT
(C)	2.	Calculate containment temperature.	Used formulas provided in OP 2104.033 Supplement 4 and given temperatures to calculate containment temperature. (134.5 to 135 F) Recorded containment temperature on OP 2104.033 Supplement 4 Step 2.1.	N/A SAT UNSAT
	3.	Record containment pressure.	Recorded containment pressure readings in OP 2104.033 Supplement 4 Step 2.2.	N/A SAT UNSAT
(C)	4.	Calculate average containment pressure.	Used table provided in OP 2104.033 Supplement 4 Step 2.2 and given pressures to calculate average containment pressure. (14.0 to 14.03 psia) Recorded average containment pressure on OP 2104.033 Supplement 4 Step 2.2.	N/A SAT UNSAT
	5.	Plot average containment pressure vs containment temperature.	Plotted calculated parameters on OP 2104.033 Supplement 4, Figure 1.	N/A SAT UNSAT
(C)	6.	Compare containment Atmospheric parameters to Technical Specification requirements.	Used containment pressure-temperature point plotted on Figure 4-1 and determined containment atmospheric conditions were not within the region of acceptable operations. Completed OP 2104.033 Supplement 4 Section 3.0 to indicate Technical Specification 3.6.1.4 non-compliance.	N/A SAT UNSAT
END				

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

Plant is in Mode 1.

PMS printer is broken and TS surveillance 4.4.6.1 needs to be completed.

The following values were recorded from PMS:

- T5605-5 = 130.57 degrees F
- T5606-6 is not available
- P5601-1 = 14.02 psia
- P5602-2 = 13.95 psia
- P5603-3 = 14.16 psia
- P5604-4 = 13.99 psia

INITIATING CUE:

The SM/CRS directs you to perform an evaluation of containment atmospheric conditions using OP 2104.033, Containment Atmosphere Control, Supplement 4.

Containment temperature: ____134.5 to 135 F______

Average Containment pressure: _____14.0 to 14.03_psia__

Is the plotted point in the Acceptable Region of Figure 1? __Yes / No__.

EXAMINEE'S COPY

INITIAL CONDITIONS:

Plant is in Mode 1.

PMS printer is broken and TS surveillance 4.4.6.1 needs to be completed.

The following values were recorded from PMS:

- T5605-5 = 130.57 degrees F
- T5606-6 is not available
- P5601-1 = 14.02 psia
- P5602-2 = 13.95 psia
- P5603-3 = 14.16 psia
- P5604-4 = 13.99 psia

INITIATING CUE:

The SM/CRS directs you to perform an evaluation of containment atmospheric conditions using OP 2104.033, Containment Atmosphere Control, Supplement 4.

Containment temperature: ____________________

Average Containment pressure: _____________________

Is the plotted point in the Acceptable Region of Figure 1? __Yes / No__.

SUPPLEMENT 4

CONTAINMENT ATMOSPHERIC CONDITIONS USING COMPUTER

This supplement provides method to determine Containment Atmospheric conditions. A PMS printout is obtained or Supplement 4 or 6 performed at least once each 12 hours in Modes 1, 2, 3 and 4 per TS 4.6.1.4. Curves in Figure 1 bound area that is Tech Spec limit with instrument error calculations incorporated. Region 1 of curve is acceptable region when only three computer points are used. Region 2 of curve, which includes Region 1, is acceptable region when all four computer points are used.

1.0 INITIAL CONDITIONS

- Verify at least one CNTMT temperature AND at least three CNTMT pressure Computer Points available.

2.0 TEST METHOD

2.1 Use one of the following to determine Containment temperature based on availability of computer data points T5605-5 and T5606-6:

- Average CNTMT Temp = (T5605-5 + T5606-6) ÷ 2 = _________ °F
- T5605-5 + 4 = _________ °F (If using only T5605-5)
- T5606-6 = _________ °F (If using only T5606-6)

NOTE

Average CNTMT pressure should be maintained between 13.9 and 14.2 psia to maintain cushion for loss of chill water unless raising pressure to 14.7 prior to outage.

2.2 Calculate average Containment pressure as follows: (N/A point if not available)

P5601-1 _________ psia   P5602-2 _________ psia

P5603-3 _________ psia   P5604-4 _________ psia

Add points and divide by total number of points used.

Average CNTMT pressure = __________ psia

2.3 Plot average Containment pressure vs temperature on Figure 1.

3.0 ACCEPTANCE CRITERIA

3.1 Did plotted point fall within bounds of Figure 1? YES NO

Performed By _________________________________ Date __________ Time __________

SUPPLEMENT 4

4.0 SUPERVISOR REVIEW AND ANALYSIS

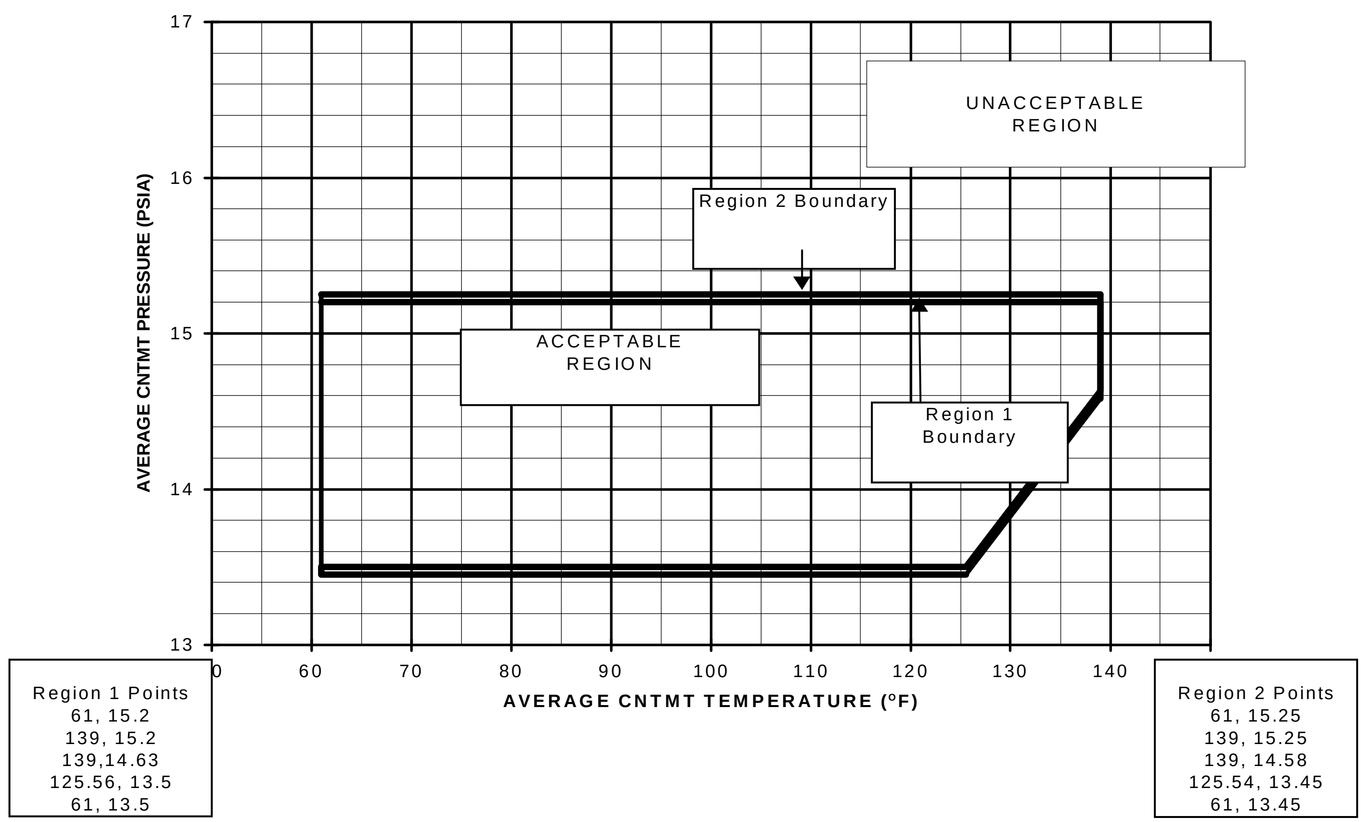
4.1 Have Containment Atmospheric conditions been proven acceptable using ACCEPTANCE CRITERIA? YES NO

4.2 IF NO answered to 4.1, THEN has Supplement 6 been performed? YES NO N/A

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

Supervisor ____ Date __________

FIGURE 1
{4.3.1}



Region 1 acceptable region when 3 computer points are used.

Region 2 includes Region 1 and area between curves and is acceptable region when all 4 computer points are used.

SUPPLEMENT 4

CONTAINMENT ATMOSPHERIC CONDITIONS USING COMPUTER

This supplement provides method to determine Containment Atmospheric conditions. A PMS printout is obtained or Supplement 4 or 6 performed at least once each 12 hours in Modes 1, 2, 3 and 4 per TS 4.6.1.4. Curves in Figure 1 bound area that is Tech Spec limit with instrument error calculations incorporated. Region 1 of curve is acceptable region when only three computer points are used. Region 2 of curve, which includes Region 1, is acceptable region when all four computer points are used.

1.0 INITIAL CONDITIONS

- Verify at least one CNTMT temperature AND at least three CNTMT pressure Computer Points available.

2.0 TEST METHOD

2.1 Use one of the following to determine Containment temperature based on availability of computer data points T5605-5 and T5606-6:

- Average CNTMT Temp = (T5605-5 + T5606-6) ÷ 2 = N/A °F
- T5605-5 + 4 = 134.57 °F (If using only T5605-5)
- T5606-6 = N/A °F (If using only T5606-6)

NOTE

Average CNTMT pressure should be maintained between 13.9 and 14.2 psia to maintain cushion for loss of chill water unless raising pressure to 14.7 prior to outage.

2.2 Calculate average Containment pressure as follows:
(N/A point if not available)

P5601-1 14.02 psia   P5602-2 13.95 psia

P5603-3 14.16 psia   P5604-4 13.99 psia

Add points and divide by total number of points used.

Average CNTMT pressure = 14.03 psia

2.3 Plot average Containment pressure vs temperature on Figure 1.

3.0 ACCEPTANCE CRITERIA

3.1 Did plotted point fall within bounds of Figure 1? YES NO

Performed By ____________________ Date __________ Time __________

SUPPLEMENT 4

4.0 SUPERVISOR REVIEW AND ANALYSIS

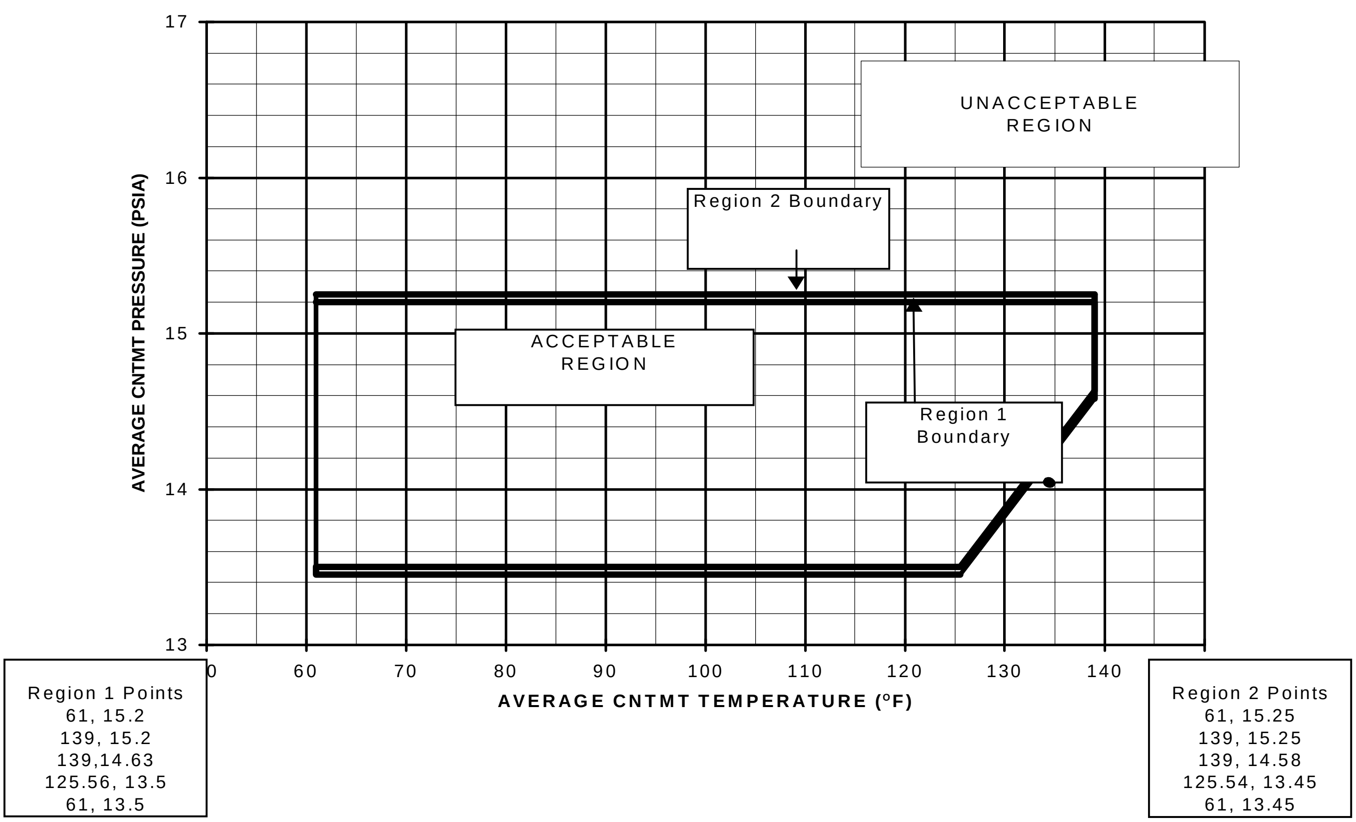
4.1 Have Containment Atmospheric conditions been proven acceptable using ACCEPTANCE CRITERIA? YES NO

4.2 IF NO answered to 4.1,
THEN has Supplement 6 been performed? YES NO N/A

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

Supervisor ____ Date __________

FIGURE 1
{4.3.1}



Region 1 acceptable region when 3 computer points are used.

Region 2 includes Region 1 and area between curves and is acceptable region when all 4 computer points are used.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

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

SYSTEM/DUTY AREA: Radiation Control

TASK: Determine Condenser off gas radiation monitor setting.

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

Alternate Path Yes: ____ No: X **Time Critical** Yes: ____ No: X

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** ____

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 375 CPM on the OPS-B2 CBO log.
- SM has given permission to adjust the alarm setpoint for 2RITS-0645.

TASK STANDARD:

Determined the new potentiometer setting for the alarm setpoint of 2RITS-0645 (potentiometer setting: 3.45) and the new voltage setting for 2RR-1057 (1.778 to 1.835) 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 highest allowable new potentiometer setting of 2RITS-0645, Condenser Off Gas Radiation Monitor, and highest allowable new voltage setting for 2RR-1057, Secondary Radiation Recorder, IAW 2105.016, Radiation Monitoring and Evacuation System, and OPS-B2 CBO log. Inform examiner when ready to adjust 2RITS-0645 alarm setpoint IAW step 11.3.2.

START TIME: _______________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1. (Step 11.1)	Determine new high alarm setpoint for 2RITS-0645 from Unit 2 CBOT Electrical 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 675 cpm.	N/A SAT UNSAT
	2. (Step 11.2)	Obtain SM permission to adjust alarm setpoints for 2RITS-0645.	Examinee determined SM permission was given from the initial conditions.	N/A SAT UNSAT
(C)	3. (Step 11.3 and 11.3.1)	Perform the following to change 2RITS-0645 high alarm setpoint on 2C25: Determine potentiometer dial setting which corresponds to desired high alarm setpoint from Table 1 below.	Examinee determined the new setting for 2RITS-0645 is 3.45 from Table 1. **Examiner Note: 675 cpm is between the values listed in table 1 and the applicant should select the value for 600 cpm to comply with step 11.1**	N/A SAT UNSAT
	4. (Step 11.3.2)	Adjust 2RITS-0645 high alarm setpoint potentiometer to required setting. **Examiner Cue: Report that the Potentiometer has been adjusted the desired setting.**	Examinee told examiner they were ready to adjust the potentiometer per the initiating cue.	N/A SAT UNSAT

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	5. (Step 11.4 and 11.4.1)	Perform the following to change 2RITS-0645 high alarm on Secondary Radiation Recorder (2RR-1057) on 2C14 and SEC SYS RADIATION HI (2K11-A10): Determine voltage setting which corresponds to desired high alarm setpoint from Table 2.	Examinee determined the new voltage setting for 2RR-1057 is 1.778 from Table 2. **Examiner Note: The value for 675 cpm is not in Table 2 and the applicant should select the value for 600 cpm to comply with step 11.1** **Examiner note: Either step 5 or step 6 is critical based on the which method the examinee chooses to determine the new voltage setting but the voltage setting must in the following band. 1.778.**	N/A SAT UNSAT
(C)	6. (Step 11.4.2)	IF desired setpoint NOT in Table 2, THEN perform the following to calculate corresponding voltage: $y = \frac{[\ln(x) - \ln(10)]}{\ln(10)}$ x = desired counts, y = required voltage setting	Examinee determined the new voltage setting to be between 1.813 and 1.835 for 675 cpm. **Examiner Note: Either step 5 or step 6 is critical based on the which method the examinee chooses to determine the new voltage setting but the voltage setting must in the following band. 1.813 to 1.835**	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 375 CPM on the OPS-B2 CBO log.
- SM has given permission to adjust the alarm setpoint for 2RITS-0645.

INITIATING CUE:

Determine the highest allowable new potentiometer setting of 2RITS-0645, Condenser Off Gas Radiation Monitor, and highest allowable new voltage setting for 2RR-1057, Secondary Radiation Recorder, IAW 2105.016, Radiation Monitoring and Evacuation System, and OPS-B2 CBO log. Inform examiner when ready to adjust 2RITS-0645 alarm setpoint IAW step 11.3.2.

2RITS-0645 potentiometer setting: ______3.45_______________________

2RR-1057 voltage setting: _____(1.778) or (1.813 to 1.835)______________________

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 375 CPM on the OPS-B2 CBO log.
- SM has given permission to adjust the alarm setpoint for 2RITS-0645.

INITIATING CUE:

Determine the highest allowable new potentiometer setting of 2RITS-0645, Condenser Off Gas Radiation Monitor, and highest allowable new voltage setting for 2RR-1057, Secondary Radiation Recorder, IAW 2105.016, Radiation Monitoring and Evacuation System, and OPS-B2 CBO log. Inform examiner when ready to adjust 2RITS-0645 alarm setpoint IAW step 11.3.2.

2RITS-0645 potentiometer setting: ______________________________

2RR-1057 voltage setting: ______________________________

CNTM PURGE MON SETPT REQUIRED Seq: 50 **Every Day** 138

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

Short Instr: TS 3.3.3.1, ODCM L2.2.1 SEE LONG INSTRUCTIONS

Long Instr: IF IN VENTILATE MODE, THEN MAX SETPOINT IS SMALLER OF 2X AVG BKGRD OR 3500 CPM. IF SETPT >2X AVG BKGRD, THEN ADJUST USING 2104.033. REFER TO TS 3.3.3.1, ODCM L2.2.1. b) IF CNTMT PURGE IS IN PROGRESS, THEN 2104.033 ATT C SATISFIES THE <2X BKGRD REQ.

Units: CPM Minimum: >= 10 Maximum: <= <EXPR>

Shift Time	Reading	Notes	Recorded By
Days	200		Joe RO
Nights			
Extra Set 1			
Extra Set 2			

Order	Description	Expression	Text	Color
1	SETPOINT EXCEEDS 2 X BACKGROUND	N(STA(138)) > N(AveLastX(137 , 4))*2	SETPOINT EXCEEDS 2 X BACKGROUND	
2	SETPOINT EXCEEDS 3500	N(STA(138)) > 3500	IF IN VENTILATE MODE, THEN MAX SETPOINT IS SMALLER OF 2X AVG BKGRD OR 3500 CPM SEE LONG INSTRUCTIONS	

Max. Expr.: N(AveLastX(138 , 4))*2

Appl. Expr.: N(STA(57))>4

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	105		Joe RO
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		Joe RO
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	375		Joe RO
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))

11.0 HIGH ALARM SETPOINT ADJUSTMENT FOR MAIN CONDENSER OFFGAS MONITOR (2RITS-0645).

11.1 Determine new high alarm setpoint for 2RITS-0645 from Unit 2 CBOT Electrical 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

11.2 Obtain SM permission to adjust alarm setpoints for 2RITS-0645.

11.3 Perform the following to change 2RITS-0645 high alarm setpoint on 2C25:

11.3.1 Determine potentiometer dial setting which corresponds to desired high alarm setpoint from Table 1 below.

11.3.2 Adjust 2RITS-0645 high alarm setpoint potentiometer to required setting.

TABLE 1

Alarm Setpoint CPM	Dial Setting	Alarm Setpoint CPM	Dial Setting	Alarm Setpoint CPM	Dial Setting	Alarm Setpoint CPM	Dial Setting
250	= 2.77	800	= 3.78	5000	= 5.24	10000	= 5.82
300	= 2.85	900	= 3.87	6000	= 5.42	20000	= 6.35
400	= 3.10	1000	= 4.00	7000	= 5.56	30000	= 6.66
500	= 3.30	2000	= 4.51	8000	= 5.68	40000	= 6.94
600	= 3.45	3000	= 4.82	9000	= 5.74	50000	= 7.09
700	= 3.62	4000	= 5.06				

11.4 Perform the following to change 2RITS-0645 high alarm on Secondary Radiation Recorder (2RR-1057) on 2C14 and SEC SYS RADIATION HI (2K11-A10):

11.4.1 Determine voltage setting which corresponds to desired high alarm setpoint from Table 2 below.

TABLE 2

Alarm Setpoint CPM	Voltage Setting	Alarm Setpoint CPM	Voltage Setting	Alarm Setpoint CPM	Voltage Setting	Alarm Setpoint CPM	Voltage Setting
250	= 1.398	425	= 1.628	1000	= 2.000	8000	= 2.903
275	= 1.439	450	= 1.653	2000	= 2.301	9000	= 2.954
300	= 1.477	500	= 1.699	3000	= 2.477	10000	= 3.000
325	= 1.512	600	= 1.778	4000	= 2.602	20000	= 3.301
350	= 1.544	700	= 1.845	5000	= 2.699	30000	= 3.477
375	= 1.574	800	= 1.903	6000	= 2.778	40000	= 3.602
400	= 1.602	900	= 1.954	7000	= 2.845	50000	= 3.699

11.4.2 IF desired setpoint NOT in Table 2,
THEN perform the following to calculate corresponding voltage:

$$y = \frac{[\ln(x) - \ln(10)]}{\ln(10)}$$

x = desired counts

y = required voltage setting

11.4.3 At 2RR-1057 on Panel 2C14, open recorder front cover.

11.4.4 Press MENU key and hold for three seconds to enter SET mode.

11.4.5 Select ALARM display by using UP/DOWN keys (Display shows “SET = ALARM”) and press ENTER key.

11.4.6 Select Channel 3 for 2RITS-0645 using UP/DOWN keys (Display shows "3:Level=") and press ENTER key.

11.4.7 Select Level of the alarm using UP/DOWN keys (Display shows “3:LEVEL = 1”) and press ENTER key.

11.4.8 Select status of alarm to ON by using UP/DOWN keys (Display shows “3/1:ALM = ON”) and press ENTER key.

11.4.9 Select Type alarm by using UP/DOWN keys to select H for high alarm. (Display shows “3/1:Type = H”) and press ENTER key.

11.4.10 Enter desired alarm setpoint voltage value by using UP/DOWN and RIGHT keys. (Display shows “3/1:X.XXX”) and press ENTER key.

11.4.11 Display which appears should show output relay to be ON (Display shows “3/1:RLY = ON”) and press ENTER key.

11.4.12 Enter relay number I03 for 2RITS-0645 using UP/DOWN keys (Display shows “3/1:R.N = I03”) and press ENTER key.

11.4.13 Verify display shows “SET OK”.

11.4.14 <u>IF</u> alarm setpoint satisfactorily changed to desired setting,
<u>THEN</u> press MENU key AND hold for three seconds to return to Operation mode.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 001 DATE: ______

SYSTEM/DUTY AREA: Conduct of Operations

TASK: Determine which operators are available for call out.

JTA#: ______

Alternate Path Yes: ______ No: X Time Critical Yes: ______ No: X

KA VALUE RO: 2.9 SRO: 3.9 KA REFERENCE: 2.1.5

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: X

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ______ PLANT SITE: ______ Classroom: ______

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 20 Minutes

REFERENCE(S): EN-OM-123, Fatigue Management Program.

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 ______

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:
Today is August 29th.
Unit 2 has been online for 300 days.
An operator for the next shift has called in sick and coverage is required from 6 am to 6 pm on Sunday August 30th.
eSOMS PQ&S and any other work hours calculators are not available due to a network outage.
All scheduled hours are required to be worked.
Four Operators are available for the watch.

Operators have averaged hours per week over previous 4 weeks prior to Aug. 23rd:

- Operator A = 40
- Operator B = 53
- Operator C = 46
- Operator D = 43

N = Nights, 12 hours shift, 6 pm to 6 am.
D = Days, 12 hours shift, 6 am to 6 pm.
T = Training, 8.5 hour shift 7:30 am to 4 pm.
= number of hours for off-shift operator who starts work at 7 am.

	Sun. Aug 23.	Mon. Aug 24.	Tue. Aug 25.	Wed. Aug 26.	Thu. Aug 27.	Fri. Aug 28.	Sat. Aug 29.	Sun. Aug 30.	Mon. Aug. 31	Tue. Sept. 1	Wed. Sept. 2	Thu. Sept. 3.	Fri. Sept. 4.	Sat. Sept. 5
Operator A			8	8	8	8	D		10	10	10	10		
Operator B	D		T	T	T	T			N	N	N	N		
Operator C		N	N	N					D	D	D	D	D	D
Operator D		D	D	D		D	D		D			N	N	N

TASK STANDARD:

Determined that operator B and D are available and operator A is not available due to <34 hour break in any 9-day period and operator C is not available due > 72 work hours in any 7 day period.

TASK PERFORMANCE AIDS:

EN-OP-123 Fatigue Management program.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

CRS/SM directs you to determine which operator(s) can cover without violating working hours using EN-OM-123, Fatigue Management Program.

If an operator(s) would violate working hours, then state how they would violate the working hour limits.

Start Time:________________

		PERFORMANCE CHECKLIST	STANDARDS	(Circle One)
Procedure Note: Work hour tracking is accomplished using the eSOMS PQ&S software. Use of an alternate compliance tool, such as by contractors / vendors, requires approval of the site SME. Work hour limits for covered workers may only be exceeded during Exceptions (Section 5.3) or when evaluated and approved using the Waiver Process (Section 5.9).				
Procedure Step for Work hour limits: Work hour limits for individuals performing Covered Work consist of the following: (a) Maximum of 16 work hours in any 24-hour period. (b) Maximum of 26 work hours in any 48-hour period. (c) Maximum of 72 work hours in any 7-day period.. (d) Minimum 10-hour break between successive work periods, except that an 8-hour break is allowed when necessary to accommodate a crew's scheduled transition between work schedules or shifts. (e) Minimum 34-hour break in any 9-day period. (f) 54-hour rolling average, as described in 5.2[3]. (g) Minimum Days Off (MDO), as described in 5.2[4] [2] Limits 5.2[1](a) through (e) apply for online and offline plant conditions. Limit 5.2[1](f) must be used when the plant is online and limit 5.2[1](g) is typically applied when the plant is offline, for individuals working on outage activities. However, limit 5.2[1](f) may also be used in lieu of limit 5.2[1](g) when the plant is offline. [3] The 54-hour rolling average limit (5.2[1](f)) is a maximum average of 54 work hours per week calculated using a rolling average period of up to 6 weeks. The requirements of the averaging calculation are modeled in the PQ&S software and include the following characteristics:				
	1. (Step 5.2	Review work hour limitations in EN-OM-123.	Examinee reviewed the limitation of section 5.2 of EN-OM-123.	N/A SAT UNSAT
(C)	2. (Step 5.2)	Using EN-OM-123 requirements review operator A schedule to determine if he can provide coverage with out violating working hour limits.	Reviewed the schedule for operator A to determine if any work hour limitations would be violated. Critical: Determined that Operator A can not cover the watch on August 30th with out violating working hour limits due to not having a Minimum 34 hour break in any 9 day period.	N/A SAT UNSAT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	3. (Step 5.2)	Using EN-OM-123 requirements review operator B schedule to determine if he can provide coverage with out violating working hour limits.	Reviewed the schedule for operator B to determine if any work hour limitations would be violated. Critical: Determined that Operator B can cover the watch on August 30th with out violating working hour limits.	N/A SAT UNSAT
(C)	4. (Step 5.2)	Using EN-OM-123 requirements review operator C schedule to determine if he can provide coverage with out violating working hour limits.	Reviewed the schedule for operator C to determine if any work hour limitations would be violated. Critical: Determined that Operator C can not cover the watch on August 30th with out violating working hour limits due to > 72 work hours in any 7-day period.	N/A SAT UNSAT
(C)	5. (Step 5.2)	Using EN-OM-123 requirements review operator D schedule to determine if he can provide coverage with out violating working hour limits.	Reviewed the schedule for operator D to determine if any work hour limitations would be violated. Critical: Determined that Operator D can cover the watch on August 30th with out violating working hour limits.	N/A SAT UNSAT
END				

Stop Time:_________________

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

Today is August 29th.
Unit 2 has been online for 300 days.
An operator for the next shift has called in sick and coverage is required from 6 am to 6 pm on Sunday August 30th.
eSOMS PQ&S and any other work hours calculators are not available due to a network outage.
All scheduled hours are required to be worked.
Four Operators are available for the watch.

Operators have averaged hours per week over previous 4 weeks prior to Aug. 23rd:

- Operator A = 40
- Operator B = 53
- Operator C = 46
- Operator D = 43

N = Nights, 12 hours shift, 6 pm to 6 am.
D = Days, 12 hours shift, 6 am to 6 pm.
T = Training, 8.5 hour shift 7:30 am to 4 pm.
= number of hours for off-shift operator who starts work at 7 am.

	Sun. Aug 23.	Mon. Aug 24.	Tue. Aug 25.	Wed. Aug 26.	Thu. Aug 27.	Fri. Aug 28.	Sat. Aug 29.	Sun. Aug 30.	Mon. Aug. 31	Tue. Sept . 1	Wed. Sept. 2	Thu. Sept. 3.	Fri. Sept. 4.	Sat. Sept. 5
Operator A			8	8	8	8	D		10	10	10	10		
Operator B	D		T	T	T	T			N	N	N	N		
Operator C		N	N	N					D	D	D	D	D	D
Operator D		D	D	D		D	D		D			N	N	N

INITIATING CUE:

CRS/SM directs you to determine which operator(s) can cover without violating working hours using EN-OM-123, Fatigue Management Program.

Operator A: Can provide coverage with out exceeding limits: Yes/No.
If No what limit is exceeded:__Minimum 34 hour break in a 9 day period____.

Operator B: Can provide coverage with out exceeding limits: Yes/No.
If No what limit is exceeded:____.

Operator C: Can provide coverage with out exceeding limits: Yes/No.
If No what limit is exceeded:____> 72 work hours in any 7-day period _______.

Operator D: Can provide coverage with out exceeding limits: Yes/No.
If No what limit is exceeded:____.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

Today is August 29th.
Unit 2 has been online for 300 days.
An operator for the next shift has called in sick and coverage is required from 6 am to 6 pm on Sunday August 30th.
eSOMS PQ&S and any other work hours calculators are not available due to a network outage.
All scheduled hours are required to be worked.
Four Operators are available for the watch.

Operators have averaged hours per week over previous 4 weeks prior to Aug. 23rd:

- Operator A = 40
- Operator B = 53
- Operator C = 46
- Operator D = 43

N = Nights, 12 hours shift, 6 pm to 6 am.
D = Days, 12 hours shift, 6 am to 6 pm.
T = Training, 8.5 hour shift 7:30 am to 4 pm.
= number of hours for off-shift operator who starts work at 7 am.

	Sun. Aug 23.	Mon. Aug 24.	Tue. Aug 25.	Wed. Aug 26.	Thu. Aug 27.	Fri. Aug 28.	Sat. Aug 29.	Sun. Aug 30.	Mon. Aug. 31	Tue. Sept . 1	Wed. Sept. 2	Thu. Sept. 3.	Fri. Sept. 4.	Sat. Sept. 5
Operator A			8	8	8	8	D		10	10	10	10		
Operator B	D		T	T	T	T			N	N	N	N		
Operator C		N	N	N					D	D	D	D	D	D
Operator D		D	D	D		D	D		D			N	N	N

INITIATING CUE:

CRS/SM directs you to determine which operator(s) can cover without violating working hours using EN-OM-123, Fatigue Management Program.

Operator A: Can provide coverage with out exceeding limits: Yes/No.
If No what limit is exceeded:____.

Operator B: Can provide coverage with out exceeding limits: Yes/No.
If No what limit is exceeded:____.

Operator C: Can provide coverage with out exceeding limits: Yes/No.
If No what limit is exceeded:____.

Operator D: Can provide coverage with out exceeding limits: Yes/No.
If No what limit is exceeded:____.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 006 **DATE:** ____________

SYSTEM/DUTY AREA: Conduct of Operations

TASK: Determine Shutdown Operations Protection Plan Condition

JTA#: A2LP-RO-SDCC

Alternate Path **Yes:** ____ **No:** X **Time Critical** **Yes:** ____ **No:** X

KA VALUE **RO:** 2.8 **SRO:** 3.9 **KA REFERENCE:** 2.1.40

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:** X

ACTUAL TESTING ENVIRONMENT: **SIMULATOR:** ____ **PLANT SITE:** ____ **Classroom:** ____

TESTING METHOD: **SIMULATE:** ____ **PERFORM:** ____

APPROXIMATE COMPLETION TIME IN MINUTES: 25 Minutes

REFERENCE(S): OP 1015.048, Shutdown Operations Protection Plan

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** ____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:
Plant is in Mode 6, RCS temperature is 90 ^{0}F.

- Fuel Transfer Canal level is 401' 6" and connected to the SFP
- RCS boron is 2701 ppm
- Both Start Up Channels and Boron Dilution Monitors are operable
- RCS dilution tagout is in place
- Time to Boil is 9 hours

Containment equipment hatch is open and personnel hatch door interlock has been defeated. Both are capable of being closed within 30 min. Escape hatch is closed.

OPS-B33 CNTMT Closure Log and OPS-B40 SDC Log/Task Checklist are being maintained by CRS Admin.

Red train is protected IAW OP 1015.008, Unit 2 SDC Control and OP 1015.008 Att. J, Protected Train and Operations Controlled Areas, is complete for the Red train.

Plant safety index is Yellow.
ANO switchyard gate and London Line substation gates are posted with a sign that reads "ATTENTION LOSS OF POWER COULD PLACE UNIT 2 AT RISK."

Core offload is currently in progress.

The following is the plant equipment alignment:
- 2P-60A, LPSI pump, running and SDC train "A" operable
- 2P-60B, LPSI pump, running
- 2P-40A, SFP cooling pump, in service
- 2P-40B, SFP cooling pump, available
- 2E-27, SFP heat exchanger, available and in service
- All RCS Thot indicators are in service
- 2P-89C, HPSI pump, aligned to Red train and protected as the RCS make up source
- 2P-89A, HPSI pump, is available but in Pull-to-Lock
- 2P-89B, HPSI pump, is tagged out for maintenance
- Charging pump heaters are removed for the RCS dilution tagout
- #1 EDG and AAC diesel are available
- SU#3 transformer is in service, SU#2 transformer is tagged out for maintenance
- Loop 1 SW is operable with 2P-4A supplying the loop
- Loop 2 SW is out of service with 2P-4B and 2P-4C tagged for bay inspection
- 2P-66, Spent Fuel Pool Purification pump, is available with sufficient RWT inventory
- 2P-109A and 2P-109B, Reactor make up water pumps, are both available for makeup from the RMWT
- Both 2P-35A and 2P-35B, Containment Spray pumps, are tagged out for maintenance

TASK STANDARD:

Determined that SOPP condition was Condition 3 and that SOPP Condition 3 was NOT MET due only to Decay Heat Removal.

TASK PERFORMANCE AIDS:

OP 1015.048, Shutdown Operations Protection Plan

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

CRS/SM directs you to determine Shutdown Operations Protection Plan (SOPP) condition for the current plant alignment IAW OP 1015.048, Shutdown Operations Protection Plan. Inform examiner of current condition after you have determined the condition.

INITIATING CUE #2:

CRS/SM directs you to complete appropriate attachment to determine if requirements are met for the condition identified using OP 1015.048, Shutdown Operations Protection Plan. (If they are not met, then state why)

Start Time:________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1. (Step 8.2)	Determine the status of the following RCS variables: Fuel Location Reactor Coolant System Integrity Reactor Coolant System / Fuel Transfer Canal Inventory	Determined that fuel was located in the Reactor Vessel and Spent Fuel Pool. Determined that RCS was open. Determined FTC flooded >23'	N/A SAT UNSAT
(C)	2. (Step 8.3)	Based upon the RCS variables, determine the correct SOPP.	Determined that SOPP Condition 3 was applicable for Unit 2	N/A SAT UNSAT
Examiner Note: The following steps are in Att. I.				
(C)	3. (Step 2.1)	Determine if the requirements are met for SOPP condition 3 for Decay Heat Removal.	Determined that Decay Heat Removal conditions were NOT met. Examiner note: This is due to having only one service water pump available for Spent Fuel Pool cooling.	N/A SAT UNSAT
	4. (Step 2.2)	Determine if the requirements are met for SOPP condition 3 for Inventory Control.	Determined that Inventory Control conditions were met.	N/A SAT UNSAT
	5. (Step 2.3)	Determine if the requirements are met for SOPP condition 3 for Electrical Power.	Determined that Electrical Power conditions were met.	N/A SAT UNSAT
	6. (Step 2.4)	Determine if the requirements are met for SOPP condition 3 for Reactivity Control.	Determined that Reactivity Control conditions were met.	N/A SAT UNSAT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	7. (Step 2.5)	Determine if the requirements are met for SOPP condition 3 for Containment.	Determined that Containment conditions were met.	N/A SAT UNSAT
	8. (Step 2.6)	Determine if the requirements are met for SOPP condition 3 for Miscellaneous items.	Determined that Miscellaneous items conditions were met.	N/A SAT UNSAT
END				

Stop Time:__________________

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

Plant is in Mode 6, RCS temperature is 90 ^{0}F.

- Fuel Transfer Canal level is 401' 6" and connected to the SFP
- RCS boron is 2701 ppm
- Both Start Up Channels and Boron Dilution Monitors are operable
- RCS dilution tagout is in place
- Time to Boil is 9 hours

Containment equipment hatch is open and personnel hatch door interlock has been defeated. Both are capable of being closed within 30 min. Escape hatch is closed.

OPS-B33 CNTMT Closure Log and OPS-B40 SDC Log/Task Checklist are being maintained by CRS Admin.

Red train is protected IAW OP 1015.008, Unit 2 SDC Control and OP 1015.008 Att. J, Protected Train and Operations Controlled Areas, is complete for the Red train.

Plant safety index is Yellow.
ANO switchyard gate and London Line substation gates are posted with a sign that reads "ATTENTION LOSS OF POWER COULD PLACE UNIT 2 AT RISK."

Core offload is currently in progress.

The following is the plant equipment alignment:

- 2P-60A, LPSI pump, running and SDC train "A" operable
- 2P-60B, LPSI pump, running
- 2P-40A, SFP cooling pump, in service
- 2P-40B, SFP cooling pump, available
- 2E-27, SFP heat exchanger, available and in service
- All RCS Thot indicators are in service
- 2P-89C, HPSI pump, aligned to Red train and protected as the RCS make up source
- 2P-89A, HPSI pump, is available but in Pull-to-Lock
- 2P-89B, HPSI pump, is tagged out for maintenance
- Charging pump heaters are removed for the RCS dilution tagout
- #1 EDG and AAC diesel are available
- SU#3 transformer is in service, SU#2 transformer is tagged out for maintenance
- Loop 1 SW is operable with 2P-4A supplying the loop
- Loop 2 SW is out of service with 2P-4B and 2P-4C tagged for bay inspection
- 2P-66, Spent Fuel Pool Purification pump, is available with sufficient RWT inventory
- 2P-109A and 2P-109B, Reactor make up water pumps, are both available for makeup from the RMWT
- Both 2P-35A and 2P-35B, Containment Spray pumps, are tagged out for maintenance

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIATING CUE #1:

CRS/SM directs you to determine Shutdown Operations Protection Plan (SOPP) condition for the current plant alignment IAW OP 1015.048, Shutdown Operations Protection Plan. Inform examiner of current condition after you have determined the condition.

Current SOPP condition: _______3__________

INITIATING CUE #2:

CRS/SM directs you to complete appropriate attachment to determine if requirements are met for the condition identified using OP 1015.048, Shutdown Operations Protection Plan. (If they are not met, then state why)

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

Plant is in Mode 6, RCS temperature is 90 ^{0}F.

- Fuel Transfer Canal level is 401' 6" and connected to the SFP
- RCS boron is 2701 ppm
- Both Start Up Channels and Boron Dilution Monitors are operable
- RCS dilution tagout is in place
- Time to Boil is 9 hours

Containment equipment hatch is open and personnel hatch door interlock has been defeated. Both are capable of being closed within 30 min. Escape hatch is closed.

OPS-B33 CNTMT Closure Log and OPS-B40 SDC Log/Task Checklist are being maintained by CRS Admin.

Red train is protected IAW OP 1015.008, Unit 2 SDC Control and OP 1015.008 Att. J, Protected Train and Operations Controlled Areas, is complete for the Red train.

Plant safety index is Yellow.
ANO switchyard gate and London Line substation gates are posted with a sign that reads "ATTENTION LOSS OF POWER COULD PLACE UNIT 2 AT RISK."

Core offload is currently in progress.

The following is the plant equipment alignment:

- 2P-60A, LPSI pump, running and SDC train "A" operable
- 2P-60B, LPSI pump, running
- 2P-40A, SFP cooling pump, in service
- 2P-40B, SFP cooling pump, available
- 2E-27, SFP heat exchanger, available and in service
- All RCS Thot indicators are in service
- 2P-89C, HPSI pump, aligned to Red train and protected as the RCS make up source
- 2P-89A, HPSI pump, is available but in Pull-to-Lock
- 2P-89B, HPSI pump, is tagged out for maintenance
- Charging pump heaters are removed for the RCS dilution tagout
- #1 EDG and AAC diesel are available
- SU#3 transformer is in service, SU#2 transformer is tagged out for maintenance
- Loop 1 SW is operable with 2P-4A supplying the loop
- Loop 2 SW is out of service with 2P-4B and 2P-4C tagged for bay inspection
- 2P-66, Spent Fuel Pool Purification pump, is available with sufficient RWT inventory
- 2P-109A and 2P-109B, Reactor make up water pumps, are both available for makeup from the RMWT
- Both 2P-35A and 2P-35B, Containment Spray pumps, are tagged out for maintenance

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIATING CUE #1:

CRS/SM directs you to determine Shutdown Operations Protection Plan (SOPP) condition for the current plant alignment IAW OP 1015.048, Shutdown Operations Protection Plan. Inform examiner of current condition after you have determined the condition.

Current SOPP condition: ___________________

INITIATING CUE #2:

CRS/SM directs you to complete appropriate attachment to determine if requirements are met for the condition identified using OP 1015.048, Shutdown Operations Protection Plan. (If they are not met, then state why)

ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE

TITLE: **SHUTDOWN OPERATIONS PROTECTION PLAN** SET #	DOCUMENT NO. **1015.048**	CHANGE NO. **017**
	WORK PLAN EXP. DATE **N/A**	REACTIVITY IMPACT ☐YES ☐INPR ☒NO
	SAFETY-RELATED ☒YES ☐NO	IPTE ☐YES ☒NO
	TEMP MOD ☐YES ☒NO	LEVEL OF USE ☐ CONTINUOUS ☐ REFERENCE ☐ INFORMATIONAL ☒ MULTI-USE
	PROGRAMMATIC EXCLUSION PER EN-LI-100 ☐YES ☒NO	

When you see these *TRAPS* | **Get these *TOOLS***

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

VERIFIED BY	DATE	TIME

FORM TITLE:	FORM NO.	CHANGE NO.
VERIFICATION COVER SHEET	**1000.006A**	**056**

NOTE
All sections and attachments of this procedure are REFERENCE USE except where specifically stated.

TABLE OF CONTENTS

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TABLE OF CONTENTS

1.0 PURPOSE

This procedure is the site-specific document for implementation of Entergy's Shutdown Safety Management Program (EN-OU-108). It provides the detailed guidance for implementation of shutdown safety at ANO.

2.0 SCOPE

The attachments and minimum equipment requirements contained in this document provide guidance for scheduled, forced (unscheduled), and refueling outages. This procedure is only applicable when the unit is at Cold Shutdown, Refueling Shutdown, or Defueled. EN-OU-108 has additional information for Training, Planning, General Implementation and Post Outage Requirements.

3.0 DESCRIPTION

This procedure was designed to maintain all KEY SAFETY FUNCTIONS in an N+1 condition where "N" is defined as the minimum number of trains or methods that are capable of satisfying those functions. An example of this would be the Unit 1 Decay Heat Removal (DHR) System. It consists of two 100% capacity trains of DHR equipment that are each capable of satisfying the DHR safety function independently. The SOPP will maintain both trains AVAILABLE during all shutdown conditions except when the Fuel Transfer Canal (FTC) is flooded to maintain a "defense in depth" perspective. When the FTC is flooded, defense in depth is provided by the additional inventory above the fuel. This large water inventory is noted in the applicable safety analyses sections of Tech Specs as providing a backup means of decay heat removal which allows us to maintain the N + 1 condition and remove one train of DHR from service. This philosophy is applied to all 5 KEY SAFETY FUNCTIONS for each ANO unit by the controls laid out in this document coupled with other station operating procedures.

The shutdown conditions dealt with by this procedure are divided into six conditions based on three Reactor Coolant System variables listed below:

<u>Fuel Location</u>

- Any fuel in the reactor vessel, REFUELING in progress
- Any fuel in the reactor vessel, no REFUELING in progress
- All fuel seated in the spent fuel pool

<u>Reactor Coolant System Integrity</u>

- OPEN
- INTACT

<u>Reactor Coolant System / Fuel Transfer Canal Inventory</u>

- RCS level ≤ LOWERED INVENTORY
- RCS level > LOWERED INVENTORY, but FTC not flooded >23' above the core
- FTC flooded > 23' above the core

Attachments with equipment listed to protect the KEY SAFETY FUNCTIONS are developed from these variables. These attachments are intended to effectively address industry concerns regarding shutdown safety during Modes 5 and 6 and defueled conditions.

4.0 REFERENCES

4.1 References Used in Procedure Preparation

- NRC Generic Letter 88-17, Loss of Decay Heat Removal
- NUMARC 91-06 Guidelines for Industry Actions to Assess Shutdown Management
- ANO-1 Technical Specifications
- ANO-2 Technical Specifications
- INPO 06-008 Guidelines for the Conduct of Outages at Nuclear Power Plants
- INPO 92-05, Guidelines for the Management of Planned Outages at Nuclear Power Stations (June of 1992)
- Shutdown Safety Management Program (EN-OU-108)
- SOER 09-01, Shutdown Safety
- IER L1-11-2, Fukushima Daiichi Nuclear Station Spent Fuel Pool Loss of Cooling and Makeup
- NEI 04-02, Guidance for Implementing a Risk-Informed, Performance Based Fire Protection Program Under 10 CFR 5048(c)
- NFPA 805 FAQ 07-0040, Non-Power Operations Clarifications
- 2CNA021502, Arkansas Nuclear One, Unit 2 – Issuance Of Amendment Regarding Transition to a Risk-Informed Performance-Based Fire Protection Program in Accordance with 10 CFR 50.48(c) (TAC NO. MF0404)
- CALC-09-E-0008-01, ANO-1 NFPA 805 Non Power Operations Assessment
- CALC-09-E-0008-02, ANO-2 NFPA 805 Non Power Operations Assessment

4.2 References Used in Conjunction with this Procedure

- Unit 2 SDC Control (1015.008)
- Decay Heat Removal and LTOP System Control (1015.002)
- Reactivity Balance Calculation (1103.015)

4.3 Commitments

4.3.1 **P16465, Equipment Hatch capable of closure in 30 minutes of determining the need to evacuate containment. (Attachments C and I)**

4.3.2 **P11922, Inform the NRC if plans are made to operate in a reduced inventory condition with only one operable onsite Diesel Generator AC power source. (Attachments F and L).**

4.3.3 **P19240, 2CAN121202, License Amendment Request to Adopt NFPA-805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 Edition) Arkansas Nuclear One – Unit 2. (Risk management activities)**

4.3.4 **P19412, 1CAN011401, License Amendment Request to Adopt NFPA-805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 Edition) Arkansas Nuclear One – Unit 1. (Risk management activities)**

5.0 DEFINITIONS

5.1 AVAILABLE – For purposes of risk determination, “A system, structure, or component along with its necessary auxiliary systems, controls, instrumentation, and power supplies is capable of performing its intended function and can be placed in service by immediate manual or automatic means.” [SOER 09-01 Rec 4]

- A system does not need to be operable as defined in the Technical Specifications and other License Basis Documents to be considered available.
- Credit may be taken for reasonable actions both in the Control Room and in-plant. A reasonable action would include an operator closing a breaker outside of the control room. Actions with implementing times approaching the time to boil are not reasonable.
- Credit may also be taken for temporary modifications (e.g., power supplies), contingency plans, and line-ups, provided site approved guidance is available.
- Credited temporary power or temporary backup equipment will be installed and tested versus only staged to consider a component available.
- Systems drained and/or out of service for maintenance are not credited as being available.
- Systems and components required to be available for shutdown safety shall not be isolated under a clearance, partially disassembled for maintenance, or otherwise unable to perform their intended function (i.e., power available, system filled and vented, support systems, available, etc.).
- Breakers that are racked down, racked out, or in the TEST position are NOT considered AVAILABLE.

5.2 CONTAINMENT CLOSURE – The action to secure primary containment and its associated structures, systems, and components as a functional barrier to fission product release under existing plant conditions.

5.3 CONTAINMENT CLOSURE CONTROLS - Controls established by applicable site procedures to track any impaired containment penetration so that at least one barrier to the release of radioactive material can be quickly achieved in the event of a loss of Decay Heat Removal or a fuel handling accident.

5.4 CONTINGENCY PLAN – A plan of compensatory actions to:

- Maintain Defense-in-Depth by alternate means when pre-outage planning reveals that specified systems, structures, or components will be unavailable.
- Restore Defense-in-Depth when system availability drops below the required Defense-in-Depth during the outage.
- Minimize the likelihood of a loss of Key Safety Functions during higher risk evolutions
- Provide response to actions for postulated events that would present a challenge to Key Safety Functions.

5.5 DECAY HEAT REMOVAL CAPABILITY – The ability to maintain RCS and SFP temperature and/or pressure below specified limits following a shutdown.

5.6 DEFENSE IN DEPTH - For the purpose of managing risk during shutdown, defense in depth is the concept of:

- Providing systems, structures and components to ensure backup of KEY SAFETY FUNCTIONS using redundant, alternate or diverse methods;
- Planning and scheduling outage activities in a manner that optimizes safety system availability; and
- Providing administrative controls that support and/or supplement the above elements.

5.7 DEFUELED - All fuel assemblies have been removed from the reactor vessel and placed in the Spent Fuel Pool.

5.8 FIRE PROTECTION FEATURES – Administrative controls, fire barriers, means of egress, industrial fire brigade personnel, and other features provided for fire protection purposes.

5.9 FIRE PROTECTION SYSTEM – Fire Detection, notification, and fire suppression systems designed, installed and maintained in accordance with the applicable NFPA codes and standards.

{4.3.3, 4.3.4} 5.10 FIRE RISK MANAGEMENT ACTIONS – specific activities to prevent fire damage in plant locations where a single fire could potentially result in the loss of components needed to maintain a KEY SAFETY FUNCTION during a HIGHER RISK EVOLUTION (HRE). One set of actions involves pre-outage identification of activities that could result in an increase in fire risk in any plant location (i.e., fire damage in a given fire area could result in the loss of a KSF) and establishing appropriate compensatory actions (e.g., rescheduling activities outside the HRE window, procedure changes, requirements for additional fire watches, protected equipment postings). Another set of actions involves evaluations conducted prior to and during a HRE to further ensure no fire damage can occur in locations where a single fire could result in the loss of KSF components.

5.11 FLEX EQUIPMENT – Portable equipment that provides means of obtaining power and water to maintain or restore key safety functions in case of an Extended Loss of AC Power (ELAP).

5.12 FUNCTIONAL (FUNCTIONALITY) – The ability of a system or component to perform its intended service with considerations that applicable technical specification requirements or licensing/design basis assumptions may not be maintained.

5.13 HIGHER RISK EVOLUTIONS - Activities, plant configurations, or conditions during outages where the plant is more susceptible to an event causing a loss of Key Safety Function.

5.14 HIGHER RISK EVOLUTION REVIEW – An evaluation of all planned or emergent activities outlined in the Entergy Corporation Shutdown Safety Management Program (SSMP) procedure EN-OU-108 for the purpose of determining the effects of these activities on the Key Safety Functions

5.15 INVENTORY CONTROL - Measures established to ensure that irradiated fuel assemblies remain adequately covered to maintain heat transfer and shielding requirements.

5.16 KEY SAFETY FUNCTION -

- Decay Heat Removal Capability (includes SFP Cooling)
- Inventory Control
- Electrical Power Availability (includes both on-site and off-site)
- Reactivity Control
- Containment Closure

5.17 LOWERED INVENTORY - the condition of the Reactor Coolant System when fuel is in the reactor vessel and the water level is at or below the reactor vessel flange. [SOER 09-01 Rec 5]

- Unit 1 Reactor Vessel flange level is 376.5’
- Unit 2 Reactor Vessel flange level is 377’ 10.5”

5.18 OPERABLE –

5.18.1 For Unit 1, OPERABLE is defined as the ability of a system to perform its specified function with all applicable Technical Specification requirements satisfied.

5.18.2 For Unit 2, see the definition of OPERABLE as delineated in 1015.008, Unit 2 SDC Control.

5.19 OUTAGE RISK ASSESSMENT TEAM (ORAT) - Group represented by members of the organization not directly responsible for development of the outage schedule, which reviews the outage schedule to assure that the plan is in compliance with the Entergy Corporation Shutdown Safety Management Program (SSMP) procedure EN-OU-108, the site specific Shutdown Safety Management Program, Technical Specifications and other License Basis Documents.

- The ORAT Chairman shall be an individual who has plant systems expertise on the same reactor type and is designated by the Director NSA.

- The ORAT consists of a minimum of one currently licensed or certified SRO, one previously (or currently) licensed or certified SRO, and one supervisor or manager with technical plant knowledge, to conduct business during the pre-outage planning phase.

- Additional Team members such as Nuclear Engineer/Reactor Engineer for Reactivity Control Issues, Fire Protection Specialist or Fire Marshal for Fire Risk Management issues, and the Outage Computer Risk Monitoring Program Owner will supplement as necessary

5.20 PROTECTED EQUIPMENT/TRAIN – Key plant equipment or systems whose failure would substantially increase the risk of core damage or containment failure if it were to become unavailable while redundant or related equipment is out of service.

5.21 REACTIVITY CONTROL - Measures established preclude inadvertent criticality, power excursions, or losses of shutdown margin, and to predict and monitor core behavior.

5.22 REACTOR COOLANT SYSTEM INTEGRITY – The ability of the Reactor Coolant System (RCS) pressure boundary to function as a principal safety barrier.

5.23 RCS OPEN –

5.23.1 For Unit 1, the RCS is considered OPEN if any of the following conditions are met:

- Rx Vessel head is removed.
- SG Primary Manway is removed, and:
  - Unobstructed by filter or ventilating devices.
  - If shield door is installed, then door shall be free to swing open without assistance and door opening path shall be free of obstructions.
- SG Primary hand hole cover is removed, and:
  - Unobstructed by filter or ventilating devices.
  - May have FME cover installed per 1402.096.
- Pressurizer Code Safety is removed, and:
  - Unobstructed by filter or ventilating devices.
  - May have FME cover installed per 1402.018 or 1402.149.
- Pressurizer Manway is removed, and:
  - Unobstructed by filter or ventilating devices.
  - No FME cover installed.
- All CRD top closure assemblies are removed, excluding RV level probe.

5.23.2 For Unit 2, the RCS is considered OPEN when the following conditions are met:

- RCS Peak Equilibrium Pressure will remain ≤ 300 psia based on LOSDC2 Computer Program

  AND
- Any of the below listed RCS vent paths aligned/removed:
  - Reactor Vessel head removed
  - SG primary manway removed not isolated by Nozzle Dams
  - Pressurizer Code Safety removed
  - Pressurizer Manway removed
  - ECCS Vent Valves open

5.24 REFUELING – An operation involving a change in core geometry by manipulation of fuel or control rods (Unit 2 CEAs) when the Reactor Vessel head is removed.

5.25 SHUTDOWN SAFETY MANAGER **-** A person designated by the Outage Manager that is familiar with the site Shutdown Safety program and the defense in depth strategies contained in this document.

5.26 SAFETY STATUS COLORS - The Safety Status Colors (Green, Yellow, Orange, and Red) are discussed in more detail in the Entergy Corporation Shutdown Safety Management Program (SSMP) procedure (EN-OU-108).

- GREEN is considered a minimal risk configuration.
- YELLOW is considered a medium risk configuration.
- ORANGE is considered a higher risk configuration.
- RED is considered a unacceptably high risk configuration.

ANO uses a shutdown EOOS model as one method to determine safety status colors during the outage. Qualitative methods are also used, in conjunction with EOOS, as outlined in this procedure to determine the safety status color. The following definition, taken from EN-OU-108, outlines the relationship between the Key Safety Functions and the applicable Safety Status Color:

> "Safety Status Colors: The results of the safety assessment qualitatively and/or quantitatively as applicable. These assessments are made in the individual Key Safety Functions (KSF). The overall outage safety status is based upon the most limiting KSF status color. The presence of a Higher Risk Evolution (HRE) activity will result in a non-GREEN color even if all the requirements for that Safety Function are satisfied. For instance, an activity that has a potential for a loss of decay heat removal will be YELLOW during its scheduled time span even if N+1 exists.
>
> The goal for the outage is to be in the "N+1" condition, where "N" is the minimum number of trains or methods that are capable of satisfying the function as defined by site-specific procedures."

Discussion:
The ANO Technical Specifications for Mode 5 and Mode 6 operations do not require maintenance of "N+1" conditions for all Key Safety Functions at all times (e.g. only one train of ES vital Switchgear and one Decay Heat Removal System are required with Fuel Transfer Canal Level 23 ft above the Fuel). Alternately, maintaining N+1 conditions in Mode 5 and Mode 6 does not assure compliance with Technical Specifications. Two sources of Off-Site Power with no Emergency Diesel Generators available will satisfy "N+1" criteria but does not satisfy Technical Specification requirements.

Some stations have defined "N" as the minimum Technical Specification required equipment with the intent of maintaining one additional train of equipment available to meet the "N+1" condition. It is also common practice for stations to enter a "yellow" risk color when a Key Safety Function has been reduced to the minimum equipment required to fulfill the applicable function.

At ANO, due to our current plant design, this would result in a "yellow" safety status color condition for a large portion of the outage. This condition would also apply during the "Defueled" condition as well due to the appropriate inclusion of Spent Fuel Pool cooling in the ANO Defense in Depth strategy.

The intent of applying a "safety status color" to an applicable plant configuration and/or during a higher risk evolution is to heighten station awareness on a reduced margin to nuclear safety with a desire to place additional emphasis on the station activities during that period. As safety status colors move toward higher risk configurations, additional actions may be required to protect or regain margins as well.

Fuel Transfer Canal water inventory, when raised to allow refueling operations, represents a significant margin increase to core damage frequency.

Based on the above discussion, ANO considers the water inventory in the Fuel Transfer Canal (when ≥ 23 ft above the core) to be a passive means of core cooling that satisfies the "+1" requirement outlined above. For this reason the check lists found in this procedure can be considered to represent the ANO defense in depth equivalent to "N+1".

While plant configurations allowed in this procedure represent acceptable defense in depth is maintained it is still prudent to identify and manage elevated risk situations that can occur within the limits of the allowed configurations. The following examples indicate situations that should be reviewed by the Outage Risk Assessment Team (ORAT) and documented for station managers (in the ORAT report) to ensure risk informed decisions are made during outages:

- Work during LOWERED INVENTORY conditions at the front end of the outage with high decay heat loads should be reviewed to ensure the benefit of performing the work is prudent to perform during this elevated risk condition.

- Maintenance and evolutions that take place with short times to Reactor Coolant System boiling (< 30 minutes) should be reviewed to ensure the benefit of performing the work is in line with the elevated risk during this condition

- Maintenance on redundant Key Safety Function Systems such as Service Water and Vital Switchgear should be evaluated and compared to predicted time to boiling in the Fuel Transfer Canal and the Spent Fuel Pool.

- Plant Design limitations that require configurations for maintenance that severely limit or remove Key Safety Functions from service [i.e. the single Unit 2 Spent Fuel Pool Heat exchanger or Unit 1 Service Water return header maintenance requiring SW-12 (SW System Loop Outage Separation Valve) to be closed] should be evaluated for actions to reduce risk. Actions such as elevating safety status color, contingency planning, temporary modifications, plant modifications, etc. should be considered to help manage risk in these cases.

5.27 SCHEDULE CHANGES - A schedule change as it relates to the SOPP is an alteration in the sequencing for removal/restoration of equipment or an alteration in the sequencing of plant configuration changes for those activities that support Key Safety Functions thus alters their relationship from the previously approved schedule. Shifting of equipment removal/restoration or plant configuration changes forward or backward in times does **not** constitute a schedule change as long as their relationship to the previously approved sequence in the outage network remains intact. Examples include:

- Any change to the schedule logic that moves an activity into or out of a System Window that could impact EOOS.
- Any change to the schedule logic for an activity that is not in a System Window but was a risk significant activity.
- Any change to the schedule logic for a System Window that is an input to the EOOS program.
- Any scope addition or deletion to the outage schedule for an activity related to a KEY SAFETY FUNCTION.
- A change in the outage schedule logic that alters a previously approved work activity associated with a KEY SAFETY FUNCTION such that the activity now overlaps another KEY SAFETY FUNCTION system window.
- A change in the outage schedule logic that affects the planned DEFENSE IN DEPTH associated with a KEY SAFETY FUNCTION, or a reduction in the actual DEFENSE IN DEPTH for these functions.
- A change in the outage schedule logic that alters the previously approved sequencing or method of filling or draining the RCS, Fuel Transfer Canal or Spent Fuel Pool.
- A change in the outage schedule logic that causes a color change for a KEY SAFETY FUNCTION in the EOOS Shutdown model results.

5.28 SPENT FUEL POOL AREA CLOSURE – The Spent Fuel Pool area is closed when the following conditions are met (IER L1-11-2 Rec 1):

- Fuel Handling Area to Train Bay Hatch (HTC-504) installed.
- Unit 1 and Unit 2 Auxiliary Building elevators are NOT on 404'.
- Fuel Handling Area from RB Purge Room (Door 92) closed.
- Unit One Fuel Handling Area Access Door (Door 89) closed.
- Unit One Fuel Handling Area (Penthouse) (Door 190) closed.
- Unit One Fuel Handling Area (Penthouse) (Door 191) closed.
- Unit One Fuel Handling Area (Penthouse) (Door 192) closed.
- U2 Spent Fuel Pool Area (Door 310) closed.
- CNTMT Purge Room to SFP (Door 319) closed.
- MSIV Room to SFP Area (Door 317) closed.

6.0 RESPONSIBILITIES

6.1 Director – NSA

- Acts as the Outage Risk Assessment Team sponsor
- Designate the Outage Risk Assessment Team chairman.

6.2 Shutdown Safety Manager

- Implement the station's Shutdown Safety Program, responsible for the day-to-day performance when the unit is in a mode where the program is applicable.
- Chair the Outage Risk Assessment Team for Pre-Outage activities and may/may not be the same person when designated by the Outage Manager for Outage implementation.
- Tracks duration of time at LOWERED INVENTORY conditions, and elevated risk conditions against originally planned and approved durations and takes appropriate actions to limit time in these conditions.

6.3 Manager of Planning, Scheduling, and Outages

- Oversight of the station's Shutdown Safety Program.
- Oversight of site communication for the following items (accomplished through Refueling Outage Execution EN-OU-105, through the "Shift Daily Status Report") [SOER 09-01 Rec 6C]:
  - Protected equipment
  - Planned protected equipment changes

6.4 OUTAGE RISK ASSESSMENT TEAM (ORAT)

6.4.1 During the pre-outage planning phase, perform a review of the outage schedule. The following aspects should be considered:

- Ensure that schedule activities that effect risk are identified in the outage schedule using proper coding.
- Major work activities and their relationships to each other so that key systems and components are available to support the Key Safety Functions.
- The planned Safety Status assigned to each plant configuration during the outage.
- Identification of risk impact of outage activities to the opposite unit and of the risk impact of opposite unit activities to the outage unit.
- Verify that abnormal or emergency operating procedures (AOPS/EOPS) for mitigating challenges to shutdown safety can be performed as written based on the outage schedule and resultant system/equipment configurations. Develop contingency plans when equipment required by the procedures will not be available. [SOER 09-01 Rec 7]

6.4.2 During pre-outage planning and preparation, complete the following as applicable:

- Approve the Higher Risk Evolution Review performed for the outage and specify any additional measures to be taken.
- Identify activities or configurations that require contingency plans.
- Approve any contingency plans that were developed to support Shutdown Safety Program requirements prior to approval of the final safety assessment.
- Specify any training requirements needed to support Shutdown Safety Program activities.
- Specify any meetings at which selected Shutdown Safety information is required to be communicated.
- Ensure any needed process changes (work orders, procedure revisions, engineering change documents for example) are tracked appropriately and Condition Reports are initiated, if required.

6.4.3 The following specific reviews shall be performed by the ORAT during the ORAT review process.

A. LOWERED INVENTORY Reviews

- The ORAT should specifically review the outage period from the time RCS drain is commenced (loops no longer available for cooling) until Fuel Transfer Canal fill is commenced. Outage activities occurring during this period should be reviewed for unnecessary extensions of this time period. Review should include the following:
  - Basis for extensions in the particular windows.
  - Can work be performed when there is a lower decay heat load?
  - Was performing this work during defueled window utilizing the Temporary Reactor Vessel Closure Head (Unit 2) or Shield Blocks (Unit 1) evaluated? (SOER 90-1 Rec 5)
- The ORAT should specifically review the initial (hot) LOWERED INVENTORY condition. This is the outage period between the first time the RCS reaches a LOWERED INVENTORY condition and when the Fuel Transfer Canal fill is commenced. Outage activities occurring during this period should be reviewed for unnecessary extensions of this time period.
- The ORAT should specifically review the final (cold) LOWERED INVENTORY condition. This is the outage period between the final time the RCS reaches a LOWERED INVENTORY condition following core reload and RCS fill is commenced. Outage activities occurring during this period should be reviewed for unnecessary extensions of this time period.

B. Additional Risk Related Reviews

- The ORAT should review the outage time to boil profile. The profile should be compared to previous outage time to boil profiles to ensure no significant changes have occurred that have an impact on this profile.
- The ORAT should specifically review new Preventive Maintenance activities being performed this outage for potential impact on Key Safety Functions.
- The ORAT should specifically review the HREs to identify the need to establish FIRE RISK MANAGEMENT ACTIONS.

C. Single Point Vulnerability Reviews

- The ORAT should review plant configurations during the outage that result in Single Point Vulnerability with respect to loss of a Key Safety Function. These are conditions where the sustained loss of a single component (e.g. Service Water Pump, Service Water Loop, ICW Pump, SFP Cooling Pump or Heat Exchanger, etc.) or offsite power could result in reactor core or Spent Fuel Pool boil off occurring. FIRE RISK MANAGEMENT ACTIONS should be considered for the areas where a Single Point Vulnerability is present.

D. Extended Loss of AC Power (ELAP) Vulnerability Review

- In cases where FLEX equipment would need to be deployed in locations that would quickly become inaccessible following a loss of decay heat removal from an ELAP event, pre-staging of the equipment is required.

- Based on the shutdown risk, determine whether FLEX equipment should be deployed or pre-staged to support maintaining or restoring the key safety functions in the event of a loss of shutdown cooling.

- Sources of borated water and methods to vent the containment, if necessary, should be identified to support the shutdown risk reduction.

E. The results of the reviews performed for this section shall be included in the ORAT report.

6.4.4 During the outage execution phase review impact of schedule changes on Key Safety Function status. Approve such changes and/or impose additional changes/requirements as needed. Approval during the outage will be required from at least one member of the ORAT outside of the Outage Scheduling Group.

6.5 Shift Manager Responsibilities

- Field authorization of planned entries into safety status ORANGE. The authorization ensures that the actual plant configuration is consistent with planned configuration when the activity was originally approved.
- Ensures the appropriate contingency plans are in place when they are required.
- Ensures that the actual plant configuration is consistent with the planned plant configuration.
- Take prompt action to restore systems and components to service whenever a "RED" risk configuration is entered or take action to minimize operation in the unacceptable risk configuration.
- Maintains overall responsibility and oversight for control of the KEY SAFETY FUNCTIONS. [SOER 09-01 Rec 3]
- Ensures "Test Team Expectations" attachment of this procedure completed when applicable.
- Concurs with the release and closure of outage and system work windows that have an impact on the shutdown safety functions. [SOER 09-01 Rec 3]

6.6 Outage Computer Risk Monitoring Program Administrator

- Owns the outage risk assessment computer model and ensures model accuracy.
- Ensures the appropriate documentation is completed for outage-related model changes.
- Works with the on-line risk assessment model owner to maintain accuracy of those model components shared between outage and on-line.
- Ensures model availability and functionality as required to support SOPP needs during both the planning and execution phases of the outage.
- Provide guidance in developing PSA-related processes and in assuring reasonable standardization between the sites. Provide guidance for transferring PSA "best practices" between the sites.
- Provide support in the performance of quantitative and/or qualitative assessments of plant risk when necessary, in conjunction with ORAT expertise.
- Provide guidance to computer risk monitoring tool users on its limitations and how to qualitatively evaluate External Events, Level 2 impacts, and SSCs outside of the tool's scope, in conjunction with ORAT expertise.

6.7 All Organizations and Personnel

- Responsible for providing risk insights in proportion to their knowledge and familiarity with affected plant systems and the specific maintenance activity under consideration.
- Ensure all emergent conditions found while activities are in progress are reported to the Control Room for additional risk assessment as needed.
- Communicate to the appropriate personnel the relative risk and mitigating strategy relevant to planned maintenance.

6.8 Manager – Outage

- Coordinates the independent review of ORAT preliminary shutdown safety assessment.
- Incorporates or resolves ORAT recommendations prior to issuance of the final schedule.
- Ensures the ORAT final shutdown safety assessment report is communicated to the appropriate plant staff.

7.0 LIMITS AND PRECAUTIONS

7.1 Avoid any system alignment changes, maintenance or testing that could cause perturbations to the Spent Fuel Cooling System.

7.2 Operations crew briefings should be conducted prior to any activity that could affect the following:

- DECAY HEAT REMOVAL System performance
- Reactor Coolant System inventory
- Spent Fuel Pool inventory.

7.3 Time spent in LOWERED INVENTORY conditions shall be minimized. If extended operation in this condition is required (i.e., longer than seven consecutive days), an assessment comparing risks of performing a full core off load to continued operation in LOWERED INVENTORY should be performed.

7.4 As of spring 2015, the ANO-2 fire protection license basis is NFPA 805, while the ANO-1 license basis is Appendix R. The ORAT will use the NFPA 805 criteria for their review of both units' schedules.

NOTE

The following section is designated INFORMATIONAL USE per Procedure and Work Instruction Use and Adherence (EN-HU-106).

8.0 INSTRUCTIONS

8.1 This procedure shall be performed to satisfy EITHER of the following conditions:

8.1.1 Once per shift to verify the availability and/or operability for the minimum required equipment for the current SOPP condition.

8.1.2 Prior to entering a new SOPP condition to verify the availability and/or operability of the minimum required equipment.

8.2 Determine the status of the following RCS variables:

8.2.1 Fuel Location

- Any fuel in the reactor vessel, Refueling in progress.
- Any fuel in the reactor vessel, no Refueling in progress.
- All fuel seated in the spent fuel pool.

8.2.2 Reactor Coolant System Integrity

- OPEN
- INTACT

8.2.3 Reactor Coolant System / Fuel Transfer Canal Inventory

- RCS level < LOWERED INVENTORY.
- RCS level > LOWERED INVENTORY, but FTC not flooded >23' above the core.
- FTC flooded > 23' above the core.

8.3 Based upon the RCS variables, determine the correct SOPP.

8.4 Perform the SOPP attachment to determine if requirements are met.

8.5 <u>IF</u> all requirements for the specific SOPP NOT met,
<u>THEN</u> notify Shift Manager of respective unit.

ATTACHMENT A

SOPP FOR UNIT 1 SHUTDOWN CONDITION 1

1.0 INITIAL CONDITIONS

1.1 Reactor Vessel Defueled

1.2 All Fuel located in the Spent Fuel Pool

2.0 REQUIREMENTS

NOTE

Cooling Water for BOTH trains of SFP cooling can be supplied by one ICW pump and one ICW Cooler being supplied by Service Water from its normal source.

2.1 Decay Heat Removal Equipment (Both Trains shall be AVAILABLE)

2.1.1 SFP Cooling Train “A” consisting of the following:

- SFP Cooling Pump P-40A
- SFP HX E-27A
- Adequate supply of cooling water

2.1.2 SFP Cooling Train “B consisting of the following:

- SFP Cooling Pump P-40B
- SFP HX E-27B
- Adequate supply of cooling water

2.2 Two AVAILABLE SFP makeup sources (circle AVAILABLE sources): (IER L1-11-2 Rec 1)

BWST via P-66	BWST via SF Purif.	DI Water
Loop 1 SW	Loop 2 SW	Boric Acid Pumps
T-12		

2.3 AVAILABLE electrical power sources should be minimum of the following (Circle AVAILABLE sources):

- At least 1 DG: .... DG1 DG2 AACG
- At least 1 offsite source: .. SU1 SU2 UA (backfed from 500KV)

2.4 SFP boron concentration > Refueling Shutdown requirement.

ATTACHMENT A

3.0 MISCELLANEOUS

3.1 Both trains of Spent Fuel Cooling posted as PROTECTED TRAIN per “Protected Area and Interconnecting System Valve Control”, Attachment J of Decay Heat Removal and LTOP Control (1015.002).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 1 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

3.3 EITHER of the following (except when performing fuel handling or operator checkouts):

- Transfer Tube Isolation Valve (SF-45) closed.
- Gate between SFP and Tilt Pit installed.

Performed By: ____________________________ Date: ____________ Time: __________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT B

SOPP FOR UNIT 1 SHUTDOWN CONDITION 2

1.0 INITIAL CONDITIONS

1.1 FTC flooded > 23' above core (> 390' elev.)

1.2 Fuel in Reactor Vessel

1.3 No REFUELING operations in progress

2.0 REQUIREMENTS

2.1 Decay Heat Removal (DHR) Equipment

2.1.1 One DHR Train shall be OPERABLE (circle OPERABLE Train)

- "A" Decay Heat Pump
- "B" Decay Heat Pump

NOTE

- One complete train of SFP cooling shall be AVAILABLE if less than 59 fuel assemblies have been transferred from the Reactor Vessel to the SFP.
- Two complete trains of SFP cooling shall be AVAILABLE if more than 59 fuel assemblies have been transferred from the Reactor Vessel to the SFP.
- Cooling Water for BOTH trains of SFP cooling can be supplied by one ICW pump and one ICW Cooler being supplied by Service Water from its normal source.

2.1.2 Spent Fuel Pool (SFP) Cooling. (circle AVAILABLE trains).

A. SFP Cooling Train "A" consisting of the following:

- SFP Cooling Pump P-40A
- SFP HX E-27A
- Adequate supply of cooling water

B. SFP Cooling Train "B consisting of the following:

- SFP Cooling Pump P-40B
- SFP HX E-27B
- Adequate supply of cooling water

ATTACHMENT B

2.2 AVAILABLE Inventory Control Makeup Flow Paths
(Check two available flow paths):

2.2.1 DECAY HEAT TRAIN A
(✓)

- Decay Heat Pump P-34A available
- RB Sump Line A Outlet CV-1414 available
- RB Sump Line A Outlet CV-1405 available
- LPI Block valve CV-1401 available
- Decay Heat Cooler E-35A Outlet (CV-1428) available
- P-34A Suction from BWST CV-1436 available
- Flowpath manual valves danger tagged or controlled by Category E controls.
  Clearance # if applicable _____________

2.2.2 DECAY HEAT TRAIN B

- Decay Heat Pump P-34B available
- RB Sump Line B Outlet CV-1415 available
- RB Sump Line B Outlet CV-1406 available
- LPI Block valve CV-1400 available
- Decay Heat Cooler E-35B Outlet (CV-1429) available
- P-34B Suction from BWST CV-1437 available
- Flowpath manual valves danger tagged or controlled by Category E controls.
  Clearance # if applicable _____________

2.2.3 Two AVAILABLE SFP makeup sources (circle AVAILABLE sources):
(IER L1-11-2 Rec 1)

BWST via P-66	BWST via SF Purif.	DI Water
Loop 1 SW	Loop 2 SW	Boric Acid Pumps

T-12

ATTACHMENT B

NOTE

- Test recirc header may be in use for other purposes such as BWST recirc for sampling or purification but shall not be tagged out for maintenance.
- Loss of Decay Heat Removal System (1203.028) provides guidance on use of RCS inventory makeup systems.
- Spray pump breaker must be racked up to be considered available.
- Danger tagging flowpath manual valves in test recirc header not required.

CAUTION

Do not open both BS-2A and BS-2B. Overpressurization of RB Spray pump suction piping will result when Spray Pump is started.

2.2.4 RB SPRAY TRAIN A

- RB Spray Pump P-35A available
- RB Sump Line A Outlet CV-1414 available
- RB Sump Line A Outlet CV-1405 available
- Test recirc header available for crossconnecting RB Spray pump discharge to the LPI system.
- Flowpath manual valves except test recirc header valves danger tagged or controlled by Category E controls.
  Clearance # if applicable _____________

2.2.5 RB SPRAY TRAIN B

- RB Spray Pump P-35B available
- RB Sump Line B Outlet CV-1415 available
- RB Sump Line B Outlet CV-1406 available
- Test recirc header available for crossconnecting RB Spray pump discharge to the LPI system.
- Flowpath manual valves except test recirc header valves danger tagged or controlled by Category E controls.
  Clearance # if applicable _____________

2.3 Electrical Power Distribution

2.3.1 At least three electrical power sources AVAILABLE (circle those AVAILABLE):

DG1 DG2 AACG SU1 SU2 UA (UA 500KV backfed)

2.3.2 Of the AVAILABLE power sources, at least one DG OPERABLE (circle those OPERABLE):

DG1 DG2 AACG (AACG operable per ANO1 TS 3.8.2 Bases)

2.3.3 Of the AVAILABLE power sources, at least one offsite power source OPERABLE (circle those OPERABLE):

SU1 SU2 UA (UA 500KV backfed)

2.3.4 An OPERABLE vital electrical distribution train (AC and DC) associated with an OPERABLE DECAY HEAT REMOVAL pump able to be powered from an on-site power source.

2.4 Reactivity control requirements:

2.4.1 One source range Nuclear Instrument shall be OPERABLE.

2.4.2 RCS boron concentration maintained greater than that required for Refueling Shutdown.

2.4.3 Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

A. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

2.5 Containment requirements

2.5.1 Ensure CONTAINMENT CLOSURE can be accomplished within time to boil in the event of a loss of DECAY HEAT REMOVAL. (Review Form 1015.002D, Containment Closure Breach List, for all currently breached penetrations.)

2.5.2 One Reactor Building Cooling fan and Service Water supply shall be AVAILABLE.

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed.

3.1.1 Post one train of Decay Heat Removal Cooling as PROTECTED TRAIN per “Protected Area and Interconnecting System Valve Control”, Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.1.2 Post at least one train of Spent Fuel Cooling as PROTECTED TRAIN per “Protected Area and Interconnecting System Valve Control”, Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.1.3 Post common train areas as PROTECTED TRAIN per “Protected Area and Interconnecting System Valve Control”, Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 1 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

3.3 AVAILABLE temperature indication on the operating DHR train.

3.4 Fuel Transfer Tube Isolation (SF-45) should be closed when fuel transfer operations are complete or are significantly delayed (may be open when performing fuel handling or operator checkouts).

Performed By: ______________________ Date: __________ Time: ________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT C

SOPP FOR UNIT 1 SHUTDOWN CONDITION 3

1.0 INITIAL CONDITIONS

1.1 FTC flooded > 23’ above core (> 390’ elev.)

1.2 Fuel in Reactor Vessel

1.3 REFUELING operations in progress

2.0 REQUIREMENTS

2.1 Decay Heat Removal (DHR) Equipment

2.1.1 One DHR Train shall be OPERABLE (circle OPERABLE Train)

- “A” Decay Heat Pump
- “B” Decay Heat Pump

NOTE

- One complete train of SFP cooling shall be AVAILABLE if less than 59 fuel assemblies have been transferred from the Reactor Vessel to the SFP.
- Two complete trains of SFP cooling shall be AVAILABLE if more than 59 fuel assemblies have been transferred from the Reactor Vessel to the SFP.
- Cooling Water for BOTH trains of SFP cooling can be supplied by one ICW pump and one ICW Cooler being supplied by Service Water from its normal source.

2.1.2 Spent Fuel Pool (SFP) Cooling

A. SFP Cooling Train “A” consisting of the following:

- SFP Cooling Pump P-40A
- SFP HX E-27A
- Adequate supply of cooling water

B. SFP Cooling Train “B consisting of the following:

- SFP Cooling Pump P-40B
- SFP HX E-27B
- Adequate supply of cooling water

2.1.3 Sufficient SFP Cooling Pumps and Heat Exchangers in-service during core offload such that the SFP cooling capacity meets the requirements of the heat load per TRM 3.7.3.

2.2 AVAILABLE Inventory Control Makeup Flow Paths
(Check two available flow paths):

2.2.1 DECAY HEAT TRAIN A

- Decay Heat Pump P-34A available
- RB Sump Line A Outlet CV-1414 available
- RB Sump Line A Outlet CV-1405 available
- LPI Block valve CV-1401 available
- Decay Heat Cooler E-35A Outlet (CV-1428) available
  P-34A Suction from BWST CV-1436 available
- Flowpath manual valves danger tagged or controlled by Category E controls.
  Clearance # if applicable _____________

2.2.2 DECAY HEAT TRAIN B

- Decay Heat Pump P-34B available
- RB Sump Line B Outlet CV-1415 available
- RB Sump Line B Outlet CV-1406 available
- LPI Block valve CV-1400 available
- Decay Heat Cooler E-35B Outlet (CV-1429) available
- P-34B Suction from BWST CV-1437 available
- Flowpath manual valves danger tagged or controlled by Category E controls.
  Clearance # if applicable _____________

2.2.3 Two AVAILABLE SFP makeup sources (circle AVAILABLE sources):
(IER L1-11-2 Rec 1)

BWST via P-66	BWST via SF Purif.	DI Water
Loop 1 SW	Loop 2 SW	Boric Acid
		Pumps

T-12

NOTE

- Test recirc header may be in use for other purposes such as BWST recirc for sampling or purification but shall not be tagged out for maintenance.
- Loss of Decay Heat Removal System (1203.028) provides guidance on use of RCS inventory makeup systems.
- Spray pump must be racked up to be considered available.
- Danger tagging flowpath manual valves in test recirc header not required.

CAUTION

Do not open both BS-2A and BS-2B. Overpressurization of RB Spray pump suction piping will result when Spray Pump is started.

2.2.4 RB SPRAY TRAIN A

- RB Spray Pump P-35A available
- RB Sump Line A Outlet CV-1414 available
- RB Sump Line A Outlet CV-1405 available
- Test recirc header available for crossconnecting RB Spray pump discharge to the LPI system.
- Flowpath manual valves except test recirc header valves danger tagged or controlled by Category E controls.
  Clearance # if applicable _____________

2.2.5 RB SPRAY TRAIN B

- RB Spray Pump P-35B available
- RB Sump Line B Outlet CV-1415 available
- RB Sump Line B Outlet CV-1406 available
- Test recirc header available for crossconnecting RB Spray pump discharge to the LPI system.
- Flowpath manual valves except test recirc header valves danger tagged or controlled by Category E controls.
  Clearance # if applicable _____________

ATTACHMENT C

2.3 Electrical Power Distribution

2.3.1 At least three electrical power sources AVAILABLE (circle those AVAILABLE):

DG1 DG2 AACG SU1 SU2 UA (UA 500KV backfed)

2.3.2 Of the AVAILABLE power sources, at least one DG OPERABLE (circle those OPERABLE):

DG1 DG2 AACG (AACG operable per ANO1 TS 3.8.2 Bases)

2.3.3 Of the AVAILABLE power sources, at least one offsite power source OPERABLE (circle those OPERABLE):

SU1 SU2 UA (UA 500KV backfed)

2.3.4 An OPERABLE vital electrical distribution train (AC and DC) associated with an OPERABLE DECAY HEAT REMOVAL pump able to be powered from an on-site Power source.

2.4 Reactivity control requirements:

2.4.1 Two source range Nuclear Instruments shall be OPERABLE.

2.4.2 RCS boron concentration maintained greater than that required for Refueling Shutdown.

2.4.3 Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

A. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

2.4.4 RCS boron concentration shall be maintained greater than that required for a Misplaced Fuel Assembly when reloading fuel into the reactor vessel or performing an incore fuel shuffle.

2.5 Containment requirements

2.5.1 At least one door on the containment personnel hatch and the emergency hatch shall be capable of being closed.

2.5.2 One Reactor Building Cooling fan and Service Water supply shall be AVAILABLE.

{4.3.1} **2.5.3 The containment equipment hatch shall not be opened unless it can be closed within thirty minutes or the estimated time to boil, whichever is least.**

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed.

3.1.1 Post one train of Decay Heat Removal Cooling as PROTECTED TRAIN per “Protected Area and Interconnecting System Valve Control”, Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.1.2 Post at least one train of Spent Fuel Cooling as PROTECTED TRAIN per “Protected Area and Interconnecting System Valve Control”, Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.1.3 Post common train areas as PROTECTED TRAIN per “Protected Area and Interconnecting System Valve Control”, Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 1 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

ATTACHMENT C

3.3 AVAILABLE temperature indication on the operating DHR train.

3.4 Fuel Handling Area ventilation in operation with OPERABLE filters.

3.5 Spent Fuel Pool Area floor equipment hatch in place.

3.6 Fuel Transfer Tube Isolation (SF-45) should be closed when fuel transfer operations are complete or are significantly delayed (may be open when performing fuel handling or operator checkouts).

Performed By: ______________________ Date: __________ Time: ________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT D

SOPP FOR UNIT 1 SHUTDOWN CONDITION 4

1.0 INITIAL CONDITIONS

1.1 RCS level > 376.5’

1.2 Fuel in Reactor Vessel

1.3 RCS INTACT

2.0 REQUIREMENTS

2.1 Decay Heat Removal (DHR) Equipment

2.1.1 Two of the following four reactor DHR Trains shall be OPERABLE per procedure 1015.002, Attachment A (circle OPERABLE trains):

- “A” Decay Heat System
- “B” Decay Heat System
- Reactor Coolant System Loop “A”
- Reactor Coolant System Loop “B”

2.1.2 Steam Generator should be AVAILABLE (circle SG AVAILABLE):

A. SG-A with the following:

1. Associated Atmospheric Dump Valve.
2. One of the following capable of supplying feedwater:
   - P-7B
   - P-7A
   - Any Condensate Pump

B. SG-B with the following:

1. Associated Atmospheric Dump Valve.
2. One of the following capable of supplying feedwater:
   - P-7B
   - P-7A
   - Any Condensate Pump

ATTACHMENT D

NOTE

Cooling Water for BOTH trains of SFP cooling can be supplied by one ICW pump and one ICW Cooler being supplied by Service Water from its normal source.

2.1.3 One SFP Cooling Train shall be AVAILABLE: (circle AVAILABLE train):

A. SFP Cooling Train “A” consisting of the following:

- SFP Cooling Pump P-40A
- SFP HX E-27A
- Adequate supply of cooling water

B. SFP Cooling Train “B consisting of the following:

- SFP Cooling Pump P-40B
- SFP HX E-27B
- Adequate supply of cooling water

2.2 AVAILABLE Inventory Control Makeup Flow Paths

2.2.1 Two HPI pumps and flow paths from the BWST to the RCS AVAILABLE (circle AVAILABLE pumps):

P-36A P-36B P-36C

2.2.2 EITHER of the following:

A. Two independent Loop “B” hot leg level instruments AVAILABLE (except during calibration).

OR

B. RCS filled and vented with a steam bubble in the PZR.

2.2.3 Two AVAILABLE SFP makeup sources (circle AVAILABLE sources): (IER L1-11-2 Rec 1)

BWST via P-66	BWST via SF Purif.	DI Water
Loop 1 SW	Loop 2 SW	Boric Acid Pumps
T-12		

2.3 Electrical Power Distribution

2.3.1 At least three electrical power sources AVAILABLE (circle those AVAILABLE):

DG1 DG2 AACG SU1 SU2 UA (UA 500KV backfed)

2.3.2 Of the AVAILABLE power sources, at least one offsite power source OPERABLE (circle those OPERABLE):

SU1 SU2 UA (UA 500KV backfed)

2.3.3 Of the AVAILABLE power sources, at least one EDG OPERABLE with automatic tie-on capability to the protected decay heat removal train (circle OPERABLE DG(s) with auto tie-on capability):

DG1 DG2

2.3.4 Is the AACG also OPERABLE
per ANO1 TS 3.8.2 Bases? .... YES NO

2.3.5 Both vital electrical distribution trains (AC <u>and</u> DC) AVAILABLE, with one vital electrical distribution train (AC and DC) OPERABLE.

2.4 Reactivity control requirements:

2.4.1 One source range Nuclear Instrument shall be OPERABLE.

2.4.2 Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

A. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

2.4.3 RCS boron concentration maintained greater than that required by Reactivity Balance Calculation (1103.015).

2.5 Containment requirements

2.5.1 Ensure CONTAINMENT CLOSURE can be accomplished within the time to boil in the event of a loss of DECAY HEAT REMOVAL. (Review Form 1015.002D, Containment Closure Breach List, for all currently breached penetrations.)

2.5.2 One Reactor Building Cooling fan and Service Water supply shall be AVAILABLE.

ATTACHMENT D

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed.

3.1.1 Post one train of Decay Heat Removal Cooling as PROTECTED TRAIN per "Protected Area and Interconnecting System Valve Control", Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.1.2 Post at least one train of Spent Fuel Cooling as PROTECTED TRAIN per "Protected Area and Interconnecting System Valve Control", Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.1.3 Post common train areas as PROTECTED TRAIN per "Protected Area and Interconnecting System Valve Control", Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.2 <u>WHEN</u> KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

<u>THEN</u> ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 1 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

3.3 Two independent Core Exit Thermocouples AVAILABLE.

3.4 Decay Heat Suction Valves (CV-1050, CV-1410, CV-1404) should not be cycled unless SGs are capable of removing decay heat.

Performed By: ______________________ Date: __________ Time: ________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT E

SOPP FOR UNIT 1 SHUTDOWN CONDITION 5

1.0 INITIAL CONDITIONS

1.1 RCS level > 376.5’

1.2 Fuel in Reactor Vessel

1.3 RCS open

1.4 FTC NOT flooded

2.0 REQUIREMENTS

2.1 Decay Heat Removal (DHR) Equipment

2.1.1 BOTH DHR Trains shall be OPERABLE per procedure 1015.002, Attachment A:

- “A” Decay Heat System
- “B” Decay Heat System

NOTE
Cooling Water for BOTH trains of SFP cooling can be supplied by one ICW pump and one ICW Cooler being supplied by Service Water from its normal source.

2.1.2 One SFP Cooling Train shall be AVAILABLE (circle AVAILABLE train):

A. SFP Cooling Train “A” consisting of the following:

- SFP Cooling Pump P-40A
- SFP HX E-27A
- Adequate supply of cooling water

B. SFP Cooling Train “B” consisting of the following:

- SFP Cooling Pump P-40B
- SFP HX E-27B
- Adequate supply of cooling water

ATTACHMENT E

2.2 AVAILABLE Inventory Control Makeup Flow Paths

2.2.1 Two AVAILABLE flow paths from the BWST to the RCS (circle AVAILABLE pumps):

P-36A P-36B P-36C P-35A P-35B

2.2.2 Two independent Loop "B" hot leg level instruments AVAILABLE (except during calibration).

2.2.3 Two AVAILABLE SFP makeup sources (circle AVAILABLE sources): (IER L1-11-2 Rec 1)

BWST via P-66	BWST via SF Purif.	DI Water
Loop 1 SW	Loop 2 SW	Boric Acid Pumps
T-12		

2.3 Electrical Power Distribution

2.3.1 At least three electrical power sources AVAILABLE (circle those AVAILABLE):

DG1 DG2 AACG SU1 SU2 UA (UA 500KV backfed)

2.3.2 Of the AVAILABLE power sources, at least one offsite power source OPERABLE (circle those OPERABLE):

SU1 SU2 UA (UA 500KV backfed)

2.3.3 Of the AVAILABLE power sources, at least one EDG OPERABLE with automatic tie-on capability to the PROTECTED DECAY HEAT REMOVAL train (circle OPERABLE DG(s) with auto tie-on capability):

DG1 DG2

2.3.4 Is the AACG also OPERABLE per ANO1 TS 3.8.2 Bases? .... YES NO

2.3.5 Both vital electrical distribution trains (AC <u>and</u> DC) AVAILABLE, with one vital electrical distribution train (AC and DC) OPERABLE.

2.4 Reactivity control requirements:

2.4.1 One source range Nuclear Instrument shall be OPERABLE.

2.4.2 Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

A. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

2.4.3 RCS boron concentration maintained greater than that required by Reactivity Balance Calculation (1103.015).

2.5 Containment requirements

2.5.1 Ensure CONTAINMENT CLOSURE can be accomplished within the time to boil in the event of a loss of DECAY HEAT REMOVAL. (Review Form 1015.002D, Containment Closure Breach List, for all currently breached penetrations.)

2.5.2 One Reactor Building Cooling fan and Service Water supply shall be AVAILABLE.

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed.

3.1.1 Post one train of Decay Heat Removal Cooling as PROTECTED TRAIN per “Protected Area and Interconnecting System Valve Control”,

Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.1.2 Post at least one train of Spent Fuel Cooling as PROTECTED TRAIN per “Protected Area and Interconnecting System Valve Control”, Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.1.3 Post common train areas as PROTECTED TRAIN per “Protected Area and Interconnecting System Valve Control”, Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 1 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

3.3 One of the following means of monitoring RCS temperature shall be AVAILABLE:

3.3.1 Two independent Core Exit Thermocouples.

3.3.2 Temperature indication on the operating DHR Train.

3.4 The Decay Heat Suction Valves (CV-1050, CV-1410 and CV-1404) shall not be cycled.

3.5 Prior to making the RCS intact the following must be satisfied:

- LTOP requirements of Decay Heat Removal and LTOP System Control (1015.002)
- Requirements of Attachment D of this procedure
- Surveillance requirements of TS LCO 3.4.11

Performed By: ____________________ Date: __________ Time: ________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT F

SOPP FOR UNIT 1 SHUTDOWN CONDITION 6

1.0 INITIAL CONDITIONS

1.1 RCS level ≤ 376.5' (LOWERED INVENTORY)

1.2 Fuel in Reactor Vessel

1.3 RCS open

2.0 REQUIREMENTS

2.1 Decay Heat Removal (DHR) Equipment

2.1.1 BOTH DHR Trains shall be OPERABLE per procedure 1015.002, Attachment A:

- "A" Decay Heat System
- "B" Decay Heat System

> **NOTE**
> Cooling Water for BOTH trains of SFP cooling can be supplied by one ICW pump and one ICW Cooler being supplied by Service Water from its normal source.

2.1.2 One SFP Cooling Train shall be AVAILABLE (circle AVAILABLE Train)

A. SFP Cooling Train "A" consisting of the following:

- SFP Cooling Pump P-40A
- SFP HX E-27A
- Adequate supply of cooling water

B. SFP Cooling Train "B" consisting of the following:

- SFP Cooling Pump P-40B
- SFP HX E-27B
- Adequate supply of cooling water

2.2 AVAILABLE Inventory Control Makeup Flow Paths

2.2.1 Two AVAILABLE flow paths from the BWST to the RCS (circle AVAILABLE pumps):

P-36A P-36B P-36C P-35A P-35B

2.2.2 Two independent Loop "B" hot leg level instruments AVAILABLE (except during calibration).

2.2.3 Tygon Tube level indication AVAILABLE.

2.2.4 Two AVAILABLE SFP makeup sources (circle AVAILABLE sources): (IER L1-11-2 Rec 1)

BWST via P-66 BWST via SF Purif. DI Water

Loop 1 SW Loop 2 SW Boric Acid Pumps

T-12

2.3 Electrical Power Distribution

2.3.1 At least two offsite power sources shall be AVAILABLE (Circle those AVAILABLE):

SU1 SU2 UA (UA 500KV backfed)

{4.3.2}

NOTE

Per OCNA089304, NRC notification is required if only one onsite Diesel Generator AC power source is OPERABLE.

2.3.2 At least two Diesel Generators shall be OPERABLE (Circle those OPERABLE):

DG1 DG2 AACG (AACG operable per ANO1 TS 3.8.2 Bases)

2.3.3 At least one DG OPERABLE with automatic tie-on capability to the protected decay heat removal train (Circle OPERABLE DG(s) with auto tie-on capability):

DG1 DG2

2.3.4 Both vital electrical distribution trains (AC and DC) shall be AVAILABLE, with one vital electrical distribution train (AC and DC) OPERABLE.

2.3.5 Communication with Dispatcher:

- Dispatcher notified of entry into LOWERED INVENTORY.
- It has been requested of Dispatcher to limit to the extent practical, maintenance on equipment outside the switchyard that could affect power supplies to the plant switchyard.
- Confirmed with Dispatcher that no planned offsite power outages are scheduled (ref. EN-OP-119).

2.4 Reactivity control requirements:

2.4.1 One source range Nuclear Instrument shall be OPERABLE.

2.4.2 Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

A. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

2.4.3 RCS boron concentration maintained greater than that required by Reactivity Balance Calculation (1103.015).

2.5 Containment requirements

2.5.1 Ensure CONTAINMENT CLOSURE can be accomplished within the time to boil in the event of a loss of DECAY HEAT REMOVAL. (Review Form 1015.002D, Containment Closure Breach List, for all currently breached penetrations.)

2.5.2 One Reactor Building Cooling fan and Service Water supply shall be AVAILABLE.

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed.

3.1.1 Post one train of Decay Heat Removal Cooling as PROTECTED TRAIN per "Protected Area and Interconnecting System Valve Control", Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.1.2 Post at least one train of Spent Fuel Cooling as PROTECTED TRAIN per "Protected Area and Interconnecting System Valve Control", Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.1.3 Post common train areas as PROTECTED TRAIN per "Protected Area and Interconnecting System Valve Control", Attachment J of Decay Heat Removal and LTOP System Control (1015.002).

3.2 <u>WHEN</u> KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below[SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

<u>THEN</u> ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 1 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

3.3 Temperature indication requirements:

3.3.1 WHEN RCS level < 375’,
THEN maintain at least two independent Core Exit Thermocouples AVAILABLE.

3.3.2 WHEN RCS level between 376.5’ and 375’,
THEN maintain at least two independent Core Exit Thermocouples AVAILABLE (preferable) or AVAILABLE temperature indication on the operating DHR train.

3.4 The Decay Heat Suction Valves (CV-1050, CV-1410 and CV-1404) shall not be cycled.

3.5 Do not perform any maintenance or testing on any of the PROTECTED EQUIPMENT/TRAIN components and avoid system alignment changes that could cause Decay Heat Removal System flow or RCS level perturbations.

Performed By: ____________________ Date: __________ Time: ________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT G

SOPP FOR UNIT 2 SHUTDOWN CONDITION 1

1.0 INITIAL CONDITIONS

1.1 Reactor Vessel Defueled

1.2 All Fuel located in the Spent Fuel Pool

2.0 REQUIREMENTS

NOTE

An SFP Cooling Train consists of a pump (2P-40A OR B),the SFP HX (2E-27A), and EITHER of the following:

- One loop of Service Water with 2 Service Water pumps
- Two Service Water loops with at least one pump for each loop.

2.1 Decay Heat Removal Equipment shall be AVAILABLE (Both SFP Cooling Trains):

2.1.1 2P-40A SFP Cooling Train

2.1.2 2P-40B SFP Cooling Train

2.2 Two AVAILABLE SFP makeup sources (circle AVAILABLE sources): (IER L1-11-2 Rec 1)

RWT via 2P-66	RMWT via 2P-109A	RMWT via 2P-109B
Loop 1 SW	Loop 2 SW	2T-12

2.3 AVAILABLE Electrical Power sources:

2.3.1 At least one DG (circle AVAILABLE electrical sources):

2EDG1 2EDG2 AACG

2.3.2 At least one offsite source (circle AVAILABLE electrical sources):

SU3 SU2 UAT

ATTACHMENT G

2.4 Reactivity Control

2.4.1 SFP boron concentration > Refueling Shutdown requirement.

2.4.2 One SFP boration source and flow path AVAILABLE (circle AVAILABLE flow paths):

- 2T-6A via 2P-39A
- 2T-6B via 2P-39B
- RWT via 2P-66

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed per “Operations Protected Train” Attachment J of Unit 2 SDC Control (1015.008).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 2 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

Performed By: ______________________ Date: __________ Time: _________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT H

SOPP FOR UNIT 2 SHUTDOWN CONDITION 2

1.0 INITIAL CONDITIONS

1.1 FTC flooded > 23' above core

1.2 Fuel in Reactor Vessel

1.3 No REFUELING operations in progress

2.0 REQUIREMENTS

2.1 Decay Heat Removal Equipment

2.1.1 One SDC Train shall be OPERABLE (circle OPERABLE train):

- "A" SDC Train with 2P-60A
- "B" SDC Train with 2P-60B
- "A" SDC Train with 2P-35A
- "B" SDC Train with 2P-35B

NOTE

An SFP Cooling Train consists of a pump (2P-40A OR B),the SFP HX (2E-27A), and EITHER of the following:

- One loop of Service Water with 2 Service Water pumps.
- Two Service Water loops with at least one pump for each loop.

2.1.2 SFP Cooling Train(s) AVAILABLE per TRM 3.9.3 or can be placed into service to maintain SFP temperature (circle AVAILABLE trains):

A. 2P-40A SFP Cooling Train

B. 2P-40B SFP Cooling Train

ATTACHMENT H

NOTE
Spray pumps (2P-35A/B) may only be considered as inventory makeup train if RV head is removed and pump is NOT being used for Shutdown Cooling.

2.2 Inventory Control Makeup Flow Paths

2.2.1 One OPERABLE RCS makeup flow path (circle OPERABLE flow paths):

2P-89A 2P-89B 2P-89C (RED) 2P-89C (GREEN)

2P-35A 2P-35B Charging

2.2.2 Two AVAILABLE SFP makeup sources (circle OPERABLE flow paths): (IER L1-11-2 Rec 1)

RWT via 2P-66 RMWT via 2P-109A RMWT via 2P-109B

Loop 1 SW Loop 2 SW 2T-12

2.3 Electrical Power Distribution

2.3.1 At least three electrical power sources AVAILABLE (circle those AVAILABLE):

2EDG1 2EDG2 AACG SU3 SU2 UAT

2.3.2 Of the AVAILABLE sources, at least one DG OPERABLE (circle those OPERABLE):

2EDG1 2EDG2 AACG

2.3.3 Of the AVAILABLE sources, at least one offsite power source OPERABLE (circle those OPERABLE):

SU3 SU2 UAT

2.4 Reactivity control requirements:

2.4.1 One source range Nuclear Instrument shall be OPERABLE.

2.4.2 RCS boron concentration greater than TS 3.9.1 requirements.

2.4.3 EITHER of the following:

A. One Boron Dilution Monitor and alarm OPERABLE.

OR

B. Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

1. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

2.5 Containment requirements

2.5.1. Ensure CONTAINMENT CLOSURE can be accomplished within 1015.008 requirements. (Review Form 1015.008A, Containment Closure Breach List, for all currently breached penetrations.)

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed per “Operations Protected Train” Attachment J of Unit 2 SDC Control (1015.008).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 2 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

3.3 Two RCS hot leg temperature indications AVAILABLE.

Performed By: ____________________ Date: __________ Time: _________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT I

SOPP FOR UNIT 2 SHUTDOWN CONDITION 3

1.0 INITIAL CONDITIONS

1.1 FTC flooded > 23' above core

1.2 Fuel in Reactor Vessel

1.3 REFUELING operations in progress

2.0 REQUIREMENTS

2.1 Decay Heat Removal Equipment

2.1.1 One SDC Train shall be OPERABLE (Circle OPERABLE Train):

- "A" SDC Train with 2P-60A
- "B" SDC Train with 2P-60B
- "A" SDC Train with 2P-35A
- "B" SDC Train with 2P-35B

NOTE

An SFP Cooling Train consists of a pump (2P-40A OR B),the SFP HX (2E-27A), and EITHER of the following:

- One loop of Service Water with 2 Service Water pumps.
- Two Service Water loops with at least one pump for each loop.

2.1.2 Both SFP Cooling Trains shall be AVAILABLE per TRM 3.9.3.

A. 2P-40A SFP Cooling Train

B. 2P-40B SFP Cooling Train

ATTACHMENT I

NOTE

Spray pumps (2P-35A/B) may only be considered as inventory makeup train if RV head is removed and pump is NOT being used for Shutdown Cooling.

2.2 Inventory Control Makeup Flow Paths

2.2.1 One OPERABLE RCS makeup flow path (Circle OPERABLE flow paths):

2P-89A	2P-89B	2P-89C (RED)	2P-89C (GREEN)
2P-35A	2P-35B	Charging	

2.2.2 Two AVAILABLE SFP makeup sources (Circle AVAILABLE sources): (IER L1-11-2 Rec 1)

RWT via 2P-66	RMWT via 2P-109A	RMWT via 2P-109B
Loop 1 SW	Loop 2 SW	2T-12

2.3 Electrical Power Distribution

2.3.1 At least three electrical power sources AVAILABLE (Circle those AVAILABLE):

2EDG1 2EDG2 AACG SU3 SU2 UAT

2.3.2 Of the AVAILABLE sources, at least one DG OPERABLE (circle those OPERABLE):

2EDG1 2EDG2 AACG

2.3.3 Of the AVAILABLE sources, at least one offsite power source OPERABLE (circle those OPERABLE):

SU3 SU2 UAT

2.4 Reactivity control requirements:

2.4.1 Two source range Nuclear Instruments shall be OPERABLE.

2.4.2 RCS boron concentration greater than TS 3.9.1 requirements.

2.4.3 Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

A. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

2.5 Containment requirements

2.5.1 At least one door on the containment personnel hatch and the emergency hatch shall be capable of being closed.

2.5.2 CNTMT closure has been established within 72 hours prior to CORE ALTERATIONS by OPS-B33 and documented on SDC Log/Task Checklist, OPS-B40. (TS 3.9.4)

{4.3.1} **2.5.3 The containment equipment hatch shall not be opened unless it can be closed within thirty minutes or the estimated time to boil, whichever is least.**

ATTACHMENT I

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed per "Operations Protected Train" Attachment J of Unit 2 SDC Control (1015.008).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 2 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

3.3 Two RCS hot leg temperature indications AVAILABLE.

Performed By: ____________________ Date: __________ Time: ________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT J

SOPP FOR UNIT 2 SHUTDOWN CONDITION 4

1.0 INITIAL CONDITIONS

NOTE

If the ECCS vent valves only are open, the RCS peak equilibrium pressure based on LOSDC2 program can be greater than 300 psia due to high decay heat load. If this is the case, then either the RCS should be rendered fully intact or a larger vent path should be provided.

1.1 RCS INTACT

1.2 Fuel in Reactor Vessel

1.3 RCS level > 377' 10.5"

2.0 REQUIREMENTS

2.1 Decay Heat Removal Equipment

2.1.1 Two SDC Trains shall be OPERABLE (Circle OPERABLE Trains):

- "A" SDC Train with 2P-60A
- "B" SDC Train with 2P-60B
- "A" RCS Loop
- "B" RCS Loop

NOTE

An SFP Cooling Train consists of a pump (2P-40A OR B),the SFP HX (2E-27A), and EITHER of the following:

- One loop of Service Water with 2 Service Water pumps
- Two Service Water loops with at least one pump for each loop.

2.1.2 One SFP Cooling Train shall be AVAILABLE per TRM 3.9.3 (Circle AVAILABLE Train):

A. 2P-40A SFP Cooling Train

B. 2P-40B SFP Cooling Train

ATTACHMENT J

2.2 Inventory Control Makeup Flow Paths

2.2.1 One OPERABLE RCS makeup flow path (Circle OPERABLE flow paths):

2P-89A 2P-89B 2P-89C (RED)

2P-89C (GREEN) Charging

2.2.2 Two AVAILABLE SFP makeup sources (Circle AVAILABLE sources): (IER L1-11-2 Rec 1)

RWT via 2P-66 RMWT via 2P-109A RMWT via 2P-109B

Loop 1 SW Loop 2 SW 2T-12

2.3 Electrical Power Distribution

2.3.1 At least three electrical power sources AVAILABLE (Circle those AVAILABLE):

2EDG1 2EDG2 AACG SU3 SU2 UAT

2.3.2 Of the AVAILABLE sources, at least one DG OPERABLE (circle those OPERABLE):

2EDG1 2EDG2 AACG

2.3.3 Of the AVAILABLE sources, at least one offsite power source OPERABLE (circle those OPERABLE):

SU3 SU2 UAT

2.4 Reactivity control requirements:

2.4.1 One source range Nuclear Instrument shall be OPERABLE.

2.4.2 RCS boron concentration greater than SDM requirements.

2.4.3 ONE of the following:

A. One Boron Dilution Monitor and alarm OPERABLE.

OR

B. Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

1. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

OR

C. Cocked CEA protection established.

2.5 Verify CNTMT Closure can be accomplished within the requirements of 1015.008, Unit 2 SDC Control. (Review 1015.008A, Containment Closure Breach List, for all currently breached penetrations.)

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed per "Operations Protected Train" Attachment J of Unit 2 SDC Control (1015.008).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 2 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

NOTE

Two examples are shown below of what would satisfy requirements of Step 3.3.

Example 1: One RCS hot leg temperature indicator and one RCS CET.

Example 2: Two RCS hot leg temperature indicators.

3.3 Two of ANY of the following AVAILABLE:

- RCS hot leg temperature indication
- RCS CETs
- RVLMS temperature indication

Performed By: ______________________ Date: __________ Time: _________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT K

SOPP FOR UNIT 2 SHUTDOWN CONDITION 5

1.0 INITIAL CONDITIONS

NOTE
If the ECCS vent valves only are open, the RCS peak equilibrium pressure based on LOSDC2 program can be greater than 300 psia due to high decay heat load. If this is the case, then either the RCS should be rendered fully intact or a larger vent path should be provided.

1.1 RCS open

1.2 Fuel in Reactor Vessel

1.3 RCS level > 377' 10.5"

1.4 Fuel Transfer Canal < 23 feet

2.0 REQUIREMENTS

2.1 Decay Heat Removal Equipment

2.1.1 Two SDC Trains shall be OPERABLE (circle OPERABLE Trains)

- "A" SDC Train with 2P-60A
- "B" SDC Train with 2P-60B
- "A" SDC Train with 2P-35A
- "B" SDC Train with 2P-35B

NOTE
An SFP Cooling Train consists of a pump (2P-40A OR B),the SFP HX (2E-27A), and EITHER of the following:

- One loop of Service Water with 2 Service Water pumps
- Two Service Water loops with at least one pump for each loop.

2.1.2 One SFP Cooling Train shall be AVAILABLE per TRM 3.9.3 (Circle AVAILABLE Train):

A. 2P-40A SFP Cooling Train

B. 2P-40B SFP Cooling Train

ATTACHMENT K

NOTE

Spray pumps (2P-35A/B) may only be considered as inventory makeup train if RV head is removed and pump is NOT being used for Shutdown Cooling.

2.2 Inventory Control Makeup Flow Paths

2.2.1 One OPERABLE RCS makeup flow path (Circle OPERABLE flow paths):

2P-89A   2P-89B   2P-89C (RED)   2P-89C (GREEN)

2P-35A   2P-35B   Charging

2.2.2 Two AVAILABLE SFP makeup sources (Circle AVAILABLE sources): (IER L1-11-2 Rec 1)

RWT via 2P-66   RMWT via 2P-109A   RMWT via 2P-109B

Loop 1 SW   Loop 2 SW   2T-12

2.3 Electrical Power Distribution

2.3.1 At least three electrical power sources AVAILABLE (Circle those AVAILABLE):

2EDG1   2EDG2   AACG   SU3   SU2   UAT

2.3.2 Of the AVAILABLE sources, at least one DG OPERABLE (circle those OPERABLE):

2EDG1   2EDG2   AACG

2.3.3 Of the AVAILABLE sources, at least one offsite power source OPERABLE (circle those OPERABLE):

SU3   SU2   UAT

2.4 Reactivity control requirements:

2.4.1 One source range Nuclear Instrument shall be OPERABLE.

2.4.2 RCS boron concentration greater than SDM requirements.

2.4.3 ONE of the following:

A. One Boron Dilution Monitor and alarm OPERABLE.

OR

B. Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

1. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

OR

C. Cocked CEA protection established.

2.5 Verify CNTMT Closure can be accomplished within the requirements of 1015.008, Unit 2 SDC Control. (Review 1015.008A, Containment Closure Breach List, for all currently breached penetrations.)

ATTACHMENT K

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed per "Operations Protected Train" Attachment J of Unit 2 SDC Control (1015.008).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 2 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

NOTE

Two examples are shown below of what would satisfy requirements of Step 3.3.

Example 1: One RCS hot leg temperature indicator and one RCS CET.

Example 2: Two RCS hot leg temperature indicators.

3.3 Two of ANY of the following AVAILABLE:

- RCS hot leg temperature indication
- RCS CETs
- RVLMS temperature indication

Performed By: ____________________ Date: __________ Time: __________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT L

SOPP FOR UNIT 2 SHUTDOWN CONDITION 6

1.0 INITIAL CONDITIONS

1.1 RCS open

1.2 Fuel in Reactor Vessel

1.3 RCS level ≤ 377’ 10.5” (LOWERED INVENTORY)

2.0 REQUIREMENTS

2.1 Decay Heat Removal Equipment

2.1.1 Two SDC Trains shall be OPERABLE (Circle OPERABLE Trains):

- “A” SDC Train with 2P-60A
- “B” SDC Train with 2P-60B
- “A” SDC Train with 2P-35A
- “B” SDC Train with 2P-35B

NOTE

An SFP Cooling Train consists of a pump (2P-40A OR B),the SFP HX (2E-27A), and EITHER of the following:

- One loop of Service Water with 2 Service Water pumps
- Two Service Water loops with at least one pump for each loop.

2.1.2 One SFP Cooling Train shall be AVAILABLE per TRM 3.9.3 (Circle AVAILABLE Train):

A. 2P-40A SFP Cooling Train

B. 2P-40B SFP Cooling Train

NOTE

- Spray pumps (2P-35A/B) may only be considered as inventory makeup train if RV head is removed and pump is NOT being used for Shutdown Cooling.
- One of the RCS makeup flow paths MUST be a HPSI Train.

2.2 Inventory Control Makeup Flow Paths

2.2.1 Two OPERABLE RCS makeup flow paths (Circle OPERABLE flow paths):

2P-89A   2P-89B   2P-89C (RED)   2P-89C (GREEN)

2P-35A   2P-35B   Charging

2.2.2 Two AVAILABLE SFP makeup sources (Circle AVAILABLE sources): (IER L1-11-2 Rec 1)

RWT via 2P-66   RMWT via 2P-109A   RMWT via 2P-109B

Loop 1 SW   Loop 2 SW   2T-12

2.3 Electrical Power Distribution

2.3.1 At least three electrical power sources AVAILABLE (Circle those AVAILABLE):

2EDG1   2EDG2   AACG   SU3   SU2   UAT

{4.3.2}

NOTE

Per OCNA089304, NRC notification is required if only one onsite Diesel Generator AC power source is OPERABLE.

2.3.2 Of the AVAILABLE sources, at least one DG shall be OPERABLE (Circle those OPERABLE):

2EDG1   2EDG2   AACG

{4.3.2}

A. **<u>IF</u> only one DG is OPERABLE,**
<u>THEN</u> prior to entering LOWERED INVENTORY, notify NRC.

2.3.3 Of the AVAILABLE sources, at least one offsite power source shall be OPERABLE (Circle those OPERABLE):

SU3   SU2   UAT

2.3.4 Communication with Dispatcher:

- Dispatcher notified of entry into LOWERED INVENTORY.
- It has been requested of Dispatcher to limit to the extent practical, maintenance on equipment outside the switchyard that could affect power supplies to the plant switchyard.
- Confirmed with Dispatcher that no planned offsite power outages are scheduled (ref. EN-OP-119).

2.4 Reactivity control requirements:

2.4.1 One source range Nuclear Instrument shall be OPERABLE.

2.4.2 RCS boron concentration greater than SDM requirements.

2.4.3 EITHER of the following:

A. One Boron Dilution Monitor and alarm OPERABLE.

OR

B. Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

1. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

2.5 Verify CNTMT Closure can be accomplished within the requirements of 1015.008, Unit 2 SDC Control. (Review 1015.008A, Containment Closure Breach List, for all currently breached penetrations.)

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed per “Operations Protected Train” Attachment J of Unit 2 SDC Control (1015.008).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 2 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

NOTE

Two examples are shown below of what would satisfy requirements of Step 3.3.

Example 1: One RCS hot leg temperature indicator and one RCS CET.

Example 2: Two RCS hot leg temperature indicators.

3.3 Two of ANY of the following AVAILABLE:

- RCS hot leg temperature indication
- RCS CETs
- RVLMS temperature indication

3.4 IF required by Fire Protection or Fire Marshal,
THEN additional Fire Risk Management Actions have been established.

Performed By: ______________________ Date: __________ Time: ________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ATTACHMENT M

Page 1 of 1

APPROVAL FOR DEPARTURE FROM SOPP REQUIREMENTS

Attachments A through L provide a set of unit-specific guidelines and minimum equipment requirements by which to conduct outages and thereby maintain nuclear safety during shutdown operations. Maintaining fire protection features and systems is another important aspect of nuclear safety. Approval for departure from these requirements is obtained by filling out this attachment. Deviations from guidelines containing a "should," require approval from the Shift Outage Manager or the Outage Manager of the applicable unit. Deviations from guidelines containing a "shall," require approval from the Operations Manager.

- Description of departure - what specific requirement will not be satisfied?

  ____

  ____

- Why is this departure necessary? ____

  ____

  ____

- Estimated duration departure will be in effect? ________________________________

  ____

  ____

- If Tech Specs or other procedures are not being complied with, then list the deviation and/or required actions. ____

  ____

- Will compensatory measures be taken? If not, why not? If so, what are they?

  ____

  ____

- Will the compensatory measures, if any, be in place prior to departing from the requirement? If not, why not?

  ____

  ____

_____________________ / ___________   _________________________ / ____________
Originator   Date   Supervisor Review   Date

_____________________ / ___________
Approved By *   Date

* Shift Outage Manager, Outage Manager, Operations Manager, or Licensing Manager

ATTACHMENT N

CONTINGENCY PLANS

Contingency plans should be developed for situations where the system availability drops below the planned DEFENSE IN DEPTH and should be AVAILABLE when entering the HIGHER RISK EVOLUTIONS for which they were developed. Personnel required to implement the contingency plan should be identified and familiar with the plan.

1.0 DECAY HEAT REMOVAL

1.1 Reactor Coolant System (use applicable procedure listed below)

- OP-1203.028, Loss of Decay Heat Removal System
- OP-2203.029, Loss of Shutdown Cooling
- OP-2202.011, Lower Mode Functional Recovery

1.2 Spent Fuel Pool Cooling

- Supply water from either unit's Service Water System for Unit 1
- OP-2203.002, Spent Fuel Pool Emergencies for Unit 2

2.0 RCS INVENTORY CONTROL (use applicable procedure listed below)

- OP-1203.028, Loss of Decay Heat Removal System
- OP-2203.029, Loss of Shutdown Cooling
- OP-2202.011, Lower Mode Functional Recovery

3.0 ELECTRICAL POWER DISTRIBUTION

A minimum of three of the six electrical power source to the vital electrical distribution trains will be maintained AVAILABLE during all outage conditions (except during offload). If AC power source availability drops below required, a contingency plan for a temporary source of AC power should be implemented.

4.0 REACTIVITY CONTROL (use applicable procedure listed below)

- OP-1104.003, Chemical Addition
- OP-2104.003, Chemical Addition

5.0 CONTAINMENT

- OP-1015.002, Decay Heat Removal and LTOP System Control
- OP-1015.008, Unit 2 SDC Control

ATTACHMENT O

ACTIONS FOR UNPLANNED KEY SAFETY FUNCTION STATUS CHANGES AND/OR CHANGES TO PROTECTED TRAIN BOUNDARIES

NOTE

Notification of managers and station personnel of unplanned changes to our risk color and/or protective train boundaries should be made as quickly as possible so required systems or components are not compromised due to their lack of knowledge. (CR-ANO-C-2012-02136)

1.0 UNPLANNED ENTRY INTO YELLOW KEY SAFETY FUNCTION STATUS AND/OR PROTECTIVE TRAIN BOUNDARY CHANGES

1.1 Notify the following of unplanned entry into Yellow Key Safety Function status and/or any changes to protected train boundaries:

- Shift Manager
- Shift Outage Manager
- Fire Marshal
- Emergent Work Manager
- Outage Control Center
- Work Management Center
- War rooms
- Station personnel via plant announcement using the following guidelines:

  "Attention all personnel. Attention all personnel. Due to (*insert brief reason for change)* **the risk level for Shutdown Operations is now greater".**

  (*If Protective Train Boundaries have changed then include the following information):* **"Protected Train Boundaries are now:** (*insert current Protected Train Boundaries)* **and are currently being posted".**

  "Please obey all postings. If you have questions concerning impact of your current job due to these changes, please contact your supervisor for further guidance".

1.2 Update all communication aids.

ATTACHMENT O

2.0 UNPLANNED ENTRY INTO ORANGE KEY SAFETY FUNCTION STATUS AND/OR PROTECTIVE TRAIN BOUNDARY CHANGES

2.1 Initiate actions to identify and post additional protected equipment.

2.2 Notify the following of unplanned entry into Orange Key Safety Function status and any changes to protected train boundaries:

- Shift Manager
- Shift Outage Manager
- Fire Marshal
- Emergent Work Manager
- Outage Control Center
- Work Management Center
- War rooms
- GMPO
- Station personnel via plant announcement using the following guidelines: (Repeat announcement 2X)

  "Attention all personnel. Attention all personnel. Due to (*insert brief reason for change)* **the risk level for Shutdown Operations is now greater".**

  (*If Protective Train Boundaries have changed then include the following information):* **"Protected Train Boundaries are now:** (*insert current Protected Train Boundaries)* **and are currently being posted".**

  "Please obey all postings. If you have questions concerning impact of your current job due to these changes, please contact your supervisor for further guidance".

2.3 Initiate actions to update all communication aids.

2.4 Implement or prepare a written contingency plan as needed and initiate the plan.

2.5 Refer to Technical Specifications.

2.6 Commence restoration of equipment to return to YELLOW unless approved by GMPO.

2.7 Initiate a Condition Report documenting unplanned change to ORANGE SAFETY FUNCTION status.

ATTACHMENT O

3.0 UNPLANNED ENTRY INTO RED KEY SAFETY FUNCTION STATUS AND/OR PROTECTIVE TRAIN BOUNDARY CHANGES

3.1 Initiate actions to identify and post additional protected equipment.

3.2 Notify the following of unplanned entry into Red Key Safety Function status and/or any changes to protected train boundaries:

- Shift Manager
- Shift Outage Manager
- Fire Marshal
- Emergent Work Manager
- Outage Control Center
- Work Management Center
- War rooms
- GMPO
- Station personnel via plant announcement using the following guidelines: (Repeat announcement 2X)

  "Attention all personnel. "Attention all personnel. Due to (*insert brief reason for change)* **the risk level for Shutdown Operations is now greater.".**

  (*If Protective Train Boundaries have changed then include the following information):* **"Protected Train Boundaries are now:** (*insert current Protected Train Boundaries)* **and are currently being posted".**

  "Please obey all postings. If you have questions concerning impact of your current job due to these changes, please contact your supervisor for further guidance".

3.3 Initiate actions to update all communication aids.

3.4 Implement or prepare a written contingency plan as needed and initiate the plan.

3.5 Halt all work, including any hot work that has potential to adversely impact the effected KEY SAFETY FUNCTIONS.

3.6 Refer to Technical Specifications.

3.7 Expedite actions needed to restore components of threatened or lost KEY SAFETY FUNCTIONS to allow exit to a less degraded status.

3.8 Verify Condition Report initiated documenting unplanned change to RED SAFETY FUNCTION status.

ATTACHMENT P

TEST TEAM EXPECTATIONS

Perform the following when Operations testing is to be performed on the Protected Train:

1.0 Brief the following:

- What is the worst thing that could go wrong? List any reasonable things below that could go wrong as a result of the test:

  ____

  ____

  ____

- Specifically list any potential impact to the in-service DHR/SDC system (alarms, loss of power to MOVs, inadvertent component actuations, etc.)

  ____

  ____

  ____

- During the brief for the evolution review any potential impact to the five key shutdown safety functions:
  - Decay Heat Removal
  - Inventory Control
  - Electrical Power Availability
  - Reactivity Control
  - Containment Closure

- Ensure the following questions are answered during the brief:
  - What could go wrong as listed above?
  - What is the potential impact to DHR/SDC as listed above?
  - What actions will be taken to minimize the risk of test performance?
  - Will 1015.002/1015.008 requirements be met during the test?
  - Will SOPP requirements be met during the test?

ATTACHMENT P

2.0 Verify that OM/AOM has assessed the risk.

3.0 IF there is any potential to impact the protected in-service DHR/SDC train, THEN verify GMPO has given permission to perform test. [CR-ANO-C-2009-02002-CA-11 CAPR]

4.0 Verify SM has given permission to perform the test.

5.0 IF testing is being performed on protected in-service cooling DHR/SDC train, THEN initiate Condition Report [CR-ANO-C-2009-02002-CA-11 CAPR measurement].

______________________ / ___________ ________________________ / ____________

Originator Date Supervisor Review Date

______________________ / ___________

Approved By * Date

* Shift Outage Manager, Outage Manager, Operations Manager, or Licensing Manager

Maintain this form attached to applicable test.

ATTACHMENT I

KEY

SOPP FOR UNIT 2 SHUTDOWN CONDITION 3

~~1.0~~ INITIAL CONDITIONS

~~1.1~~ FTC flooded > 23’ above core

~~1.2~~ Fuel in Reactor Vessel

~~1.3~~ REFUELING operations in progress

2.0 REQUIREMENTS

~~2.1~~ Decay Heat Removal Equipment

~~2.1.1~~ One SDC Train shall be OPERABLE (Circle OPERABLE Train):

- ~~“A” SDC Train with 2P-60A~~
- “B” SDC Train with 2P-60B
- “A” SDC Train with 2P-35A
- “B” SDC Train with 2P-35B

~~**NOTE**~~

An SFP Cooling Train consists of a pump ~~(2P-40A~~ OR B),the SFP HX ~~(2E-27A)~~, and EITHER of the following:

- One loop of Service Water with 2 Service Water pumps.
- Two Service Water loops with at least one pump for each loop.

2.1.2 Both SFP Cooling Trains shall be AVAILABLE per TRM 3.9.3.

A. 2P-40A SFP Cooling Train

B. 2P-40B SFP Cooling Train

Decay heat
NOT Met

ATTACHMENT I

> **~~NOTE~~**
> Spray pumps (2P-35A/B) may only be considered as inventory makeup train if RV head is removed and pump is NOT being used for Shutdown Cooling.

~~2.2~~ Inventory Control Makeup Flow Paths

~~2.2.1~~ One OPERABLE RCS makeup flow path (Circle OPERABLE flow paths):

2P-89A 2P-89B 2P-89C (RED) 2P-89C (GREEN)

2P-35A 2P-35B Charging

~~2.2.2~~ Two AVAILABLE SFP makeup sources (Circle AVAILABLE sources): (IER L1-11-2 Rec 1)

RWT via 2P-66 RMWT via 2P-109A RMWT via 2P-109B

Loop 1 SW Loop 2 SW 2T-12

~~2.3~~ Electrical Power Distribution

~~2.3.1~~ At least three electrical power sources AVAILABLE (Circle those AVAILABLE):

2EDG1 2EDG2 AACG SU3 SU2 UAT

~~2.3.2~~ Of the AVAILABLE sources, at least one DG OPERABLE (circle those OPERABLE):

2EDG1 2EDG2 AACG

~~2.3.3~~ Of the AVAILABLE sources, at least one offsite power source OPERABLE (circle those OPERABLE):

SU3 SU2 UAT

ATTACHMENT I

2.4 Reactivity control requirements:

2.4.1 Two source range Nuclear Instruments shall be OPERABLE.

2.4.2 RCS boron concentration greater than TS 3.9.1 requirements.

2.4.3 Reactor Coolant System dilution flow paths administratively controlled (e.g. caution tags, danger tags, locks, etc.).

A. Implement dilution flow path controls until entering Mode 5 with all reactor vessel head closure bolts fully tensioned.

2.5 Containment requirements

2.5.1 At least one door on the containment personnel hatch and the emergency hatch shall be capable of being closed.

2.5.2 CNTMT closure has been established within 72 hours prior to CORE ALTERATIONS by OPS-B33 and documented on SDC Log/Task Checklist, OPS-B40. (TS 3.9.4)

{4.3.1} **2.5.3** **The containment equipment hatch shall not be opened unless it can be closed within thirty minutes or the estimated time to boil, whichever is least.**

ATTACHMENT I

3.0 MISCELLANEOUS

3.1 PROTECTED TRAIN signs and barriers (ropes, flagging, etc.) installed per "Operations Protected Train" Attachment J of Unit 2 SDC Control (1015.008).

3.2 WHEN KEY SAFETY FUNCTION defense in depth is reduced by ANY of the inoperable train/components listed below [SOER 09-01 Rec 2],

- Inoperable Decay Heat Removal Train
- Inoperable offsite power source
- Inoperable Diesel Generator
- Plant Safety Index is Orange (High Risk)

THEN ensure Switchyard Access Controls are in place by performing the following:

3.2.1 Use sign headed "ATTENTION LOSS OF POWER COULD PLACE UNIT 2 AT RISK".

3.2.2 Install sign **ON GATE LOCK** at the following locations:

- Switchyard Main Entrance Gate
- London Line Substation Yard Gate

3.3 Two RCS hot leg temperature indications AVAILABLE.

Performed By: ______________________ Date: __________ Time: ________

Send Copy of this checklist to Shift Outage Manager if the OCC is manned.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 002 DATE: ______

SYSTEM/DUTY AREA: Equipment Control

TASK: Verify RPS trip set point determination for inoperable MSSV

JTA#: ANO-SRO-ADMIN-NORM-231

KA VALUE RO: 3.4 SRO: 4.7 KA REFERENCE: 2.2.40

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): 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 ______

INITIAL CONDITIONS:
- The plant is at 90% power, 440 EFPD, Steady State.
- MSSV testing is in progress.
- The following are the MSSV as found lift pressure reported by maintenance:

MSSV	As found lift pressure	MSSV	As found lift pressure
2PSV-1002	1068 psig	2PSV-1052	1086 psig
2PSV-1003	1070 psig	2PSV-1053	1092 psig
2PSV-1004	1111 psig	2PSV-1054	1106 psig
2PSV-1005	1135 psig	2PSV-1055	1121 psig
2PSV-1006	1108 psig	2PSV-1056	1097 psig

TASK STANDARD:
Determined that 2PSV-1003 and 2PSV-1056 are inoperable (1 MSSV per header) and determined the maximum High Linear Power Level and RPS trip set point to be 87.0% to comply with Technical Specification 3.7.1.1.

TASK PERFORMANCE AIDS: Unit 2 Tech Specs

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE #1 :

Determine operability of the MSSVs IAW with Tech Specs.

INITIATING CUE #2 :

Determine the Maximum High Linear Power Level and RPS Trip Set point per Tech Specs allowed for this condition to remain at power.

Reactor Engineering reports MTC for 440 EFPD is $-2.6E^{-4} \Delta k/k/°F$.

Start Time:_________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	1.	Using Tech Spec 3.7.1.1 Table 3.7-5 determines operability of MSSVs.	Examinee derived that one MSSV on each header is inoperable. (2PSV-1003 and 2PSV-1056)	N/A SAT UNSAT
	2.	Using Tech Spec 3.7.1.1 Table 3.7-1 determines new maximum power and RPS linear power trip set point.	Examinee derived from table based on 1 MSSV inoperable on each header, the maximum allowable linear power level and RPS trip setpoint to be 71%.	N/A SAT UNSAT
(C)	.	Using Tech Spec 3.7.1.1 figure 3.7-1 determines new maximum power and RPS linear power trip set point.	Examinee derived from graph based on MTC of $-2.6E^{-4} \Delta k/k/°F$ and knowing that one MSSV is inoperable on each header determined that maximum power and RPS linear power trip set point should be 87.0%.	N/A SAT UNSAT
END				

EXAMINER'S COPY

INITIAL CONDITIONS:

- The plant is at 90% power, 440 EFPD, Steady State.
- MSSV testing is in progress.
- The following are the MSSV as found lift pressure reported by maintenance:

MSSV	As found lift pressure	MSSV	As found lift pressure
2PSV-1002	1068 psig	2PSV-1052	1086 psig
2PSV-1003	1070 psig	2PSV-1053	1092 psig
2PSV-1004	1111 psig	2PSV-1054	1106 psig
2PSV-1005	1135 psig	2PSV-1055	1121 psig
2PSV-1006	1108 psig	2PSV-1056	1097 psig

INITIATING CUE #1:

Determine operability of the MSSVs IAW with Tech Specs. **2PSV-1003 and 2PSV-1056 are inoperable.**

INITIAL CONDITIONS: (same as previous initial conditions)

- The plant is at 90% power, 440 EFPD, Steady State.
- MSSV testing is in progress.
- The following are the MSSV as found lift pressure reported by maintenance:

MSSV	As found lift pressure	MSSV	As found lift pressure
2PSV-1002	1068 psig	2PSV-1052	1086 psig
2PSV-1003	1070 psig	2PSV-1053	1092 psig
2PSV-1004	1111 psig	2PSV-1054	1106 psig
2PSV-1005	1135 psig	2PSV-1055	1121 psig
2PSV-1006	1108 psig	2PSV-1056	1097 psig

INITIATING CUE #2:

Determine the <u>Maximum</u> High Linear Power Level and RPS Trip Set point per Tech Specs allowed for this condition to remain at power.

Reactor Engineering reports MTC for 440 EFPD is $-2.6E^{-4}\Delta k/k/°F$.

Maximum Power Level is 87% per Tech Spec figure 3.7-1

EXAMINEE'S COPY

INITIAL CONDITIONS:

- The plant is at 90% power, 440 EFPD, Steady State.
- MSSV testing is in progress.
- The following are the MSSV as found lift pressure reported by maintenance:

MSSV	As found lift pressure	MSSV	As found lift pressure
2PSV-1002	1068 psig	2PSV-1052	1086 psig
2PSV-1003	1070 psig	2PSV-1053	1092 psig
2PSV-1004	1111 psig	2PSV-1054	1106 psig
2PSV-1005	1135 psig	2PSV-1055	1121 psig
2PSV-1006	1108 psig	2PSV-1056	1097 psig

INITIATING CUE #1:

Determine operability of the MSSVs IAW with Tech Specs.

INITIAL CONDITIONS: (same as previous initial conditions)

- The plant is at 90% power, 440 EFPD, Steady State.
- MSSV testing is in progress.
- The following are the MSSV as found lift pressure reported by maintenance:

MSSV	As found lift pressure	MSSV	As found lift pressure
2PSV-1002	1068 psig	2PSV-1052	1086 psig
2PSV-1003	1070 psig	2PSV-1053	1092 psig
2PSV-1004	1111 psig	2PSV-1054	1106 psig
2PSV-1005	1135 psig	2PSV-1055	1121 psig
2PSV-1006	1108 psig	2PSV-1056	1097 psig

INITIATING CUE #2:

Determine the Maximum High Linear Power Level and RPS Trip Set point per Tech Specs allowed for this condition to remain at power.

Reactor Engineering reports MTC for 440 EFPD is $-2.6E^{-4}\Delta k/k/°F$.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 000 DATE: ____________

SYSTEM/DUTY AREA: Radiation Control

TASK: Calculated expected dose for Re-entry during an emergency and determine if entry is allowed

LP#: ASLP-RO-RADP

KA VALUE RO: 3.2 SRO: 3.7 KA REFERENCE: 2.3.4

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: 20 Minutes

REFERENCE(S): 1903.033 and 1903.033A form

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 ________

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall ensure that the examinee has been briefed on NUREG 1021 Appendix E.

JPM INITIAL TASK 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.

A Site Area Emergency has been declared based on the RDACS dose rate.

RDACS dose rates are continuing to rise and the trend indicates they will exceed GE criteria if the release is not terminated.

Whole body dose rates in area of work are 7.3 Rem/hr.

RP estimates that it will take approximately 75 minutes to complete emergency actions and stop the release.

Joe Mechanic and Ralph RP have been selected to make the entry to stop the release but have not volunteered.

Joe Mechanic and Ralph RP have been briefed on the task and entry requirements.

Ed Engineer the Emergency Director has authorized 10CFR20 limits can be exceeded.

Joe Mechanic’s ERIMS dose to date is 382 mR and has badge number 20031.

Ralph RP’s ERIMS dose to date 1353 mR and has badge number 20005.

TASK STANDARD:

Determine that 10CFR20 limits can be exceeded for protection of Large populations by

calculating Joe Mechanics and Ralph RP’s dose and complete 1903.033A form for entry.

TASK PERFORMANCE AIDS:

1903.033 Protective Action Guidelines for Recue/Repair and Damage Control Teams.

SIMULATOR SETUP:

NA

EXAMINER'S NOTES:

INITIATING CUE:

The SM directs, use 1903.033 Protective Action Guidelines for Rescue/Repair and Damage control Teams determine Joe Mechanic and Ralph RP's estimated year to date total dose for repair and determine if entry is allowed.

If entry is allowed, then complete 1903.033A Authorization form for increasing exposure above 10CFR20 limits.

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	1.	Calculate Joe Mechanic's estimated dose	Calculated Joe Mechanic's estimated dose to in the following range: 9082 to 9882 mR	N/A SAT UNSAT
(C)	2.	Calculate Ralph RP's estimated dose	Calculated Ralph RP's estimated dose to in the following range: 10053 to 10853 mR	N/A SAT UNSAT
(C)	3.	Determine if Joe Mechanic's is allowed to make the entry to stop the release.	Determined that Joe Mechanic is allowed to make the entry for protection of Large populations.	N/A SAT UNSAT
(C)	4.	Determine if Ralph RP's is allowed to make the entry to stop the release.	Determined that Ralph RP is allowed to make the entry for protection of Large populations.	N/A SAT UNSAT
(C)	5.	Complete 1903.033A	Completed section 1 of 1903.033A, selected box 2 for protection of large populations (dose < 25 Rem) Completed section 2 of 1903.033A included Joe Mechanic and Ralph RP as exceeding 10CFR20 dose limits.	N/A SAT UNSAT
Examiner Note: If the applicant fills out the 1903.033A but does not sign the form for the TSC director or for the briefing being complete this is still considered they completed the task correctly.				
END				

EXAMINER'S COPY

JPM INITIAL TASK CONDITIONS:

Given the following Plant 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.
- A Site Area Emergency has been declared based on the RDACS dose rate.
- RDACS dose rates are continuing to rise and the trend indicates they will exceed GE criteria if the release is not terminated.
- Whole body dose rates in area of work are 7.3 Rem/hr.
- RP estimates that it will take approximately 75 minutes to complete emergency actions and stop the release.
- Joe Mechanic and Ralph RP have been selected to make the entry to stop the release but have not volunteered.
- Joe Mechanic and Ralph RP have been briefed on the task and entry requirements.
- Ed Engineer the Emergency Director has authorized 10CFR20 limits can be exceeded.
- Joe Mechanic's ERIMS dose to date is 382 mR and has badge number 20031.
- Ralph RP's ERIMS dose to date 1353 mR and has badge number 20005.

INITIATING CUE:

The SM directs, use 1903.033 Protective Action Guidelines for Rescue/Repair and Damage control Teams determine Joe Mechanic and Ralph RP's estimated year to date total dose for repair and determine if entry is allowed.

If entry is allowed, then complete 1903.033A Authorization form for increasing exposure above 10CFR20 limits.

Joe Mechanic's estimated TEDE dose: ______9082 to 9882________ mR

Ralph RP's estimated TEDE dose: ________10053 to 10853_______ mR

Can Joe Mechanic perform re-entry and complete the task? YES / NO

Can Ralph RP perform re-entry and complete the task? YES / NO

EXAMINEE'S COPY

JPM INITIAL TASK CONDITIONS:

Given the following Plant 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.
- A Site Area Emergency has been declared based on the RDACS dose rate.
- RDACS dose rates are continuing to rise and the trend indicates they will exceed GE criteria if the release is not terminated.
- Whole body dose rates in area of work are 7.3 Rem/hr.
- RP estimates that it will take approximately 75 minutes to complete emergency actions and stop the release.
- Joe Mechanic and Ralph RP have been selected to make the entry to stop the release but have not volunteered.
- Joe Mechanic and Ralph RP have been briefed on the task and entry requirements.
- Ed Engineer the Emergency Director has authorized 10CFR20 limits can be exceeded.
- Joe Mechanic's ERIMS dose to date is 382 mR and has badge number 20031.
- Ralph RP's ERIMS dose to date 1353 mR and has badge number 20005.

INITIATING CUE:

The SM directs, use 1903.033 Protective Action Guidelines for Rescue/Repair and Damage control Teams determine Joe Mechanic and Ralph RP's estimated year to date total dose for repair and determine if entry is allowed.

If entry is allowed, then complete 1903.033A Authorization form for increasing exposure above 10CFR20 limits.

Joe Mechanic's estimated TEDE dose: ______________________ mR

Ralph RP's estimated TEDE dose: ______________________ mR

Can Joe Mechanic perform re-entry and complete the task? YES / NO

Can Ralph RP perform re-entry and complete the task? YES / NO

I. A Rescue/Repair and Damage Control Team has been formed. A reentry must be made for: (check one)

☐ 1. Protecting valuable property (lower dose not practicable). Planned dose shall not exceed 10 Rem TEDE.

☐ 2. Lifesaving or protection of large populations (lower dose not practicable). Planned dose shall not exceed 25 Rem TEDE.

☐ 3. >25 Rem TEDE:

a. Lifesaving or protection of large populations.

b. Only on a voluntary basis to persons fully aware of the risks involved.

II. The individuals listed below have been briefed on the requirements of the task and the guidelines in section 6.1.3. They have been authorized to exceed the dose limits of 10CFR20 if necessary to accomplish this task within the guidelines listed in Section 6.1.3.

NAME (PRINTED)	**SIGNATURE** **	**BADGE NUMBER**

III. AUTHORIZATION*
Print & Sign
SM/EPM/ED ______________________/______________________ ______________
(signed) (date)

* May be given verbally via telephone, radio, or other means.

** Signifies person has been briefed concerning guidelines for exceeding 10CFR20 dose limits (1903.033A).

cc: Personnel File
Personal Dosimetry Record

I. A Rescue/Repair and Damage Control Team has been formed. A reentry must be made for: (check one)

☐ 1. Protecting valuable property (lower dose not practicable). Planned dose shall not exceed 10 Rem TEDE.

☒ 2. Lifesaving or protection of large populations (lower dose not practicable). Planned dose shall not exceed 25 Rem TEDE.

☐ 3. >25 Rem TEDE:

a. Lifesaving or protection of large populations.

b. Only on a voluntary basis to persons fully aware of the risks involved.

II. The individuals listed below have been briefed on the requirements of the task and the guidelines in section 6.1.3. They have been authorized to exceed the dose limits of 10CFR20 if necessary to accomplish this task within the guidelines listed in Section 6.1.3.

NAME (PRINTED)	**SIGNATURE** **	**BADGE NUMBER**
Joe Mechanic	Signed Here	20031
Ralph RP	Signed Here	20005

III. AUTHORIZATION*
Print & Sign
SM/EPM/ED ___ Ed Engineer ___/ Signed Here Per Telecon ______________
(signed) (date)

* May be given verbally via telephone, radio, or other means.

** Signifies person has been briefed concerning guidelines for exceeding 10CFR20 dose limits (1903.033A).

cc: Personnel File
Personal Dosimetry Record

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 004 **DATE:** ______

SYSTEM/DUTY AREA: Emergency Plan

TASK: Determine protective action recommendations

JTA#: ANO-SRO-EPLAN-EMERG-301

Alternate Path Yes: ____ No: X **Time Critical** Yes: X No: ____

KA VALUE RO: 2.4 SRO: 4.4 **KA REFERENCE:** 2.1.44

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: X

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

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): Emergency Response/Notification; Attachment 6, Protective Action recommendations for General Emergency.

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** ____

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Unit 2 has experienced a 500 gpm LOCA.
- The site has just upgraded from SAE to a General Emergency due to FG-1 (Loss of ANY two barriers AND loss of potential loss of third barrier).
- Containment barrier is considered lost.
- Containment High Range radiation monitors are reading 2200 Rem/hr.
- A release is in progress with EPA Protective Action Guidelines are projected to be 1500 mRem TEDE and 3000 mRem Child Thyroid outside of the site boundary and less than 2 miles from site.
- RDACS projects EPA Protective Action Guidelines to NOT be exceeded in any zones outside of 2 miles.
- Wind direction is from 252°.

TASK STANDARD:

A PAR 7 was declared.
Recommended evacuating to a 2 mile radius and 2-5 miles downwind. **(Zones G, H,and K)**.
Recommended sheltering 5-10 miles downwind. **(Zones I, J, L, and M)**
Recommend zones **N, O, P, Q, R, S, T, and U** to go indoors and listen to the emergency for this event.
Completed within 15 of notifying the examiner of being ready to start.

TASK PERFORMANCE AIDS:

OP-1903.011 Emergency Response/Notification; Attachment 6, Protective Action recommendations for General Emergency.

EXAMINER NOTES:

This is a time critical JPM IAW 1903.011, Emergency Response/Notification, Attachment 6.

JOB PERFORMANCE MEASURE

INITIATING CUE:

Using 1903.011 Attachment 6, perform the following:

1. Determine the appropriate PAR for the given conditions.
2. Determine the zones to be recommended for evacuation/sheltering to the State Health Department for the given conditions.
3. Determine the zones to be recommended to go indoors to the State Health Department for the given conditions.

START TIME: ________________

PERFORMANCE CHECKLIST			**STANDARDS**	(Circle One)
Examiner Note: The following steps are from the OP1903.011 Attachment 6 PAR flow chart page 1.				
(C)	1. (Flow chart page 1)	Will this be the first PAR for the event?	Examinee determined that this is the first PAR due to the GE just being declared and answered YES.	N/A SAT UNSAT
(C)	2. (Flow chart page 1)	Is there a LOSS of the containment fission product barrier in accordance with procedure 1903.010?	Examinee answered YES that the containment barrier is lost from the initial conditions.	N/A SAT UNSAT
(C)	3. (Flow chart page 1)	Is Containment High Range Rad Monitor reading > 4000 R/hr.	Examinee answered NO that the containment barrier is lost from the initial conditions.	N/A SAT UNSAT
(C)	4. (Flow chart page 1)	Radiological release with site boundary dose > 1,000 mr TEDE or 5,000 mr CDE Thyroid is expected in <= 1hr?	Examinee answered YES that there is a release with site boundary dose greater than 1000 mr TEDE or 5,000 mr CDE Thyroid. And determined PAR 7 is applicable.	N/A SAT UNSAT
(C)	5. (PAR 7, step 2.)	Recommend evacuation of 2 mile radius and 2-5 miles downwind. Recommend shelter for 5 -10 miles downwind. Recommend that the remainder of the EPZ go indoors.	Using 1903.011 Attachment 6, examinee recommended Evacuating Zones G, H, and K. AND Sheltering Zones I,J,L, and M. AND Zones to go indoors are the following: N,O,P,Q,R,S,T, and U	N/A SAT UNSAT
(C)	6.	JPM complete in 15 minutes.	JPM completed by examinee in 15 minutes with 5 minutes to read conditions.	N/A SAT UNSAT
END				

STOP TIME: __________________

EXAMINER'S COPY

This is a time critical JPM

INITIAL CONDITIONS:

- Unit 2 has experienced a 500 gpm LOCA.
- The site has just upgraded from SAE to a General Emergency due to FG-1 (Loss of ANY two barriers AND loss of potential loss of third barrier).
- Containment barrier is considered lost.
- Containment High Range radiation monitors are reading 2200 Rem/hr.
- A release is in progress with EPA Protective Action Guidelines are projected to be 1500 mRem TEDE and 3000 mRem Child Thyroid outside of the site boundary and less than 2 miles from site.
- RDACS projects EPA Protective Action Guidelines to NOT be exceeded in any zones outside of 2 miles.
- Wind direction is from 252°.

INITIATING CUE:

Using 1903.011 Attachment 6, perform the following:

1. Determine the appropriate PAR for the given conditions.
2. Determine the zones to be recommended for evacuation/sheltering to the State Health Department for the given conditions.
3. Determine the zones to be recommended to go indoors to the State Health Department for the given conditions.

Write Answer below:

1) PAR(s) declared	Par 7
2. Zones to be evacuated or sheltered (specify)	Evacuate Zones G, H, and K Shelter Zones I, J, L, and M
3) Zones to go indoors	Zones N,O,P,Q,R,S,T, and U

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

This is a time critical JPM

INITIAL CONDITIONS:

- Unit 2 has experienced a 500 gpm LOCA.
- The site has just upgraded from SAE to a General Emergency due to FG-1 (Loss of ANY two barriers AND loss of potential loss of third barrier).
- Containment barrier is considered lost.
- Containment High Range radiation monitors are reading 2200 Rem/hr.
- A release is in progress with EPA Protective Action Guidelines are projected to be 1500 mRem TEDE and 3000 mRem Child Thyroid outside of the site boundary and less than 2 miles from site.
- RDACS projects EPA Protective Action Guidelines to NOT be exceeded in any zones outside of 2 miles.
- Wind direction is from 252°.

INITIATING CUE:

Using 1903.011 Attachment 6, perform the following:

1. Determine the appropriate PAR for the given conditions.
2. Determine the zones to be recommended for evacuation/sheltering to the State Health Department for the given conditions.
3. Determine the zones to be recommended to go indoors to the State Health Department for the given conditions.

Write Answer below:

1) PAR(s) declared ______________________________

2) Zones to be evacuated or sheltered (specify) ______________________________

3) Zones to go indoors ______________________________

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

Table of Contents

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

Discussion

This attachment provides instructions for the assessment and initiation of Protective Action Recommendations (PARs) following the declaration of a General Emergency classification. Offsite response agencies shall be notified of Protective Action Recommendation within 15 minutes. Revisions to Protective Action Recommendations may be based upon:

- Current plant conditions
- Projected offsite dose assessment
- Forecasted/actual wind shifts

Evacuation is the preferred method for protecting the public within the ANO 10-mile Emergency Planning Zone (EPZ) as a result of a radiological emergency event at ANO. However, some circumstances may warrant a protective action of “shelter” when evacuation cannot be performed due to impediments and/or severe weather conditions. Individuals responsible for determining PARs at ANO should consider all circumstances when developing protective actions.

In the event of a “shelter” PAR, coordinate with ADH to develop a plan for transitioning out of this protective action as soon as possible. This is especially of concern during weather extremes since the public is advised to shut down ventilation systems.

The Arkansas Department of Health (ADH) will be notified of the ANO protective action recommendations and are responsible for determining and issuing a Protective Action Advisory (PAA) to the County Judges (Conway, Johnson, Logan, Pope and Yell counties). Arkansas law places the responsibility for issuing protective actions to the public with the County Judges which will have both a Protective Action Recommendation and a Protective Action Advisory available for decision making. At a General Emergency classification, the Arkansas Department of Health, at a minimum, will issue a default Protective Action Advisory of “evacuate a 5-mile radius and evacuate 5-10 miles downwind and the remaining EPZ to remain indoors and listen to emergency broadcasts”. At a General Emergency classification, ANO, at a minimum, will issue a default Protective Action Recommendation (PAR) of “evacuate a 2-mile radius and evacuate 2-5 miles downwind and the remaining EPZ to remain indoors and listen to emergency broadcasts”. The ADH Protective Action Advisory encompasses a larger area than that recommended by federal guidance and the ANO General Emergency classification PAR. Be aware of this difference between the ANO protective action recommendation and the ADH protective action advisory should a question arise. ANO PARs meet all of the EPA/NRC recommended regulatory guidance and are consistent with the rest of the nuclear industry.

Guidance Involving Wind Shifts within the 10-mile EPZ

If wind shifts are occurring or are predicted to occur within the 10-mile EPZ, guidance is provided on PAR No. 6 within this attachment.

Use of the PAR Flowchart in Attachment 6

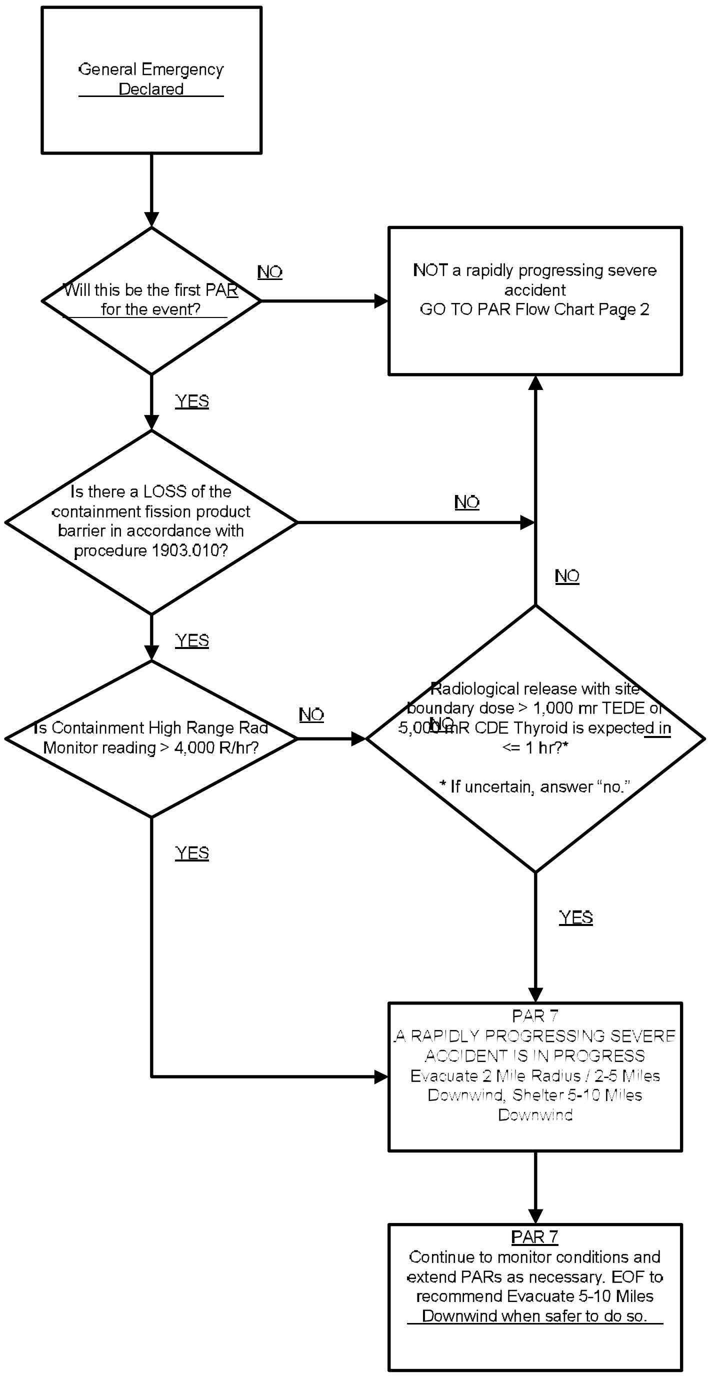
A PAR Flowchart is included on Pages 3 and 4 of this attachment. This flowchart should be used initially starting on Page 3 and at the beginning of each subsequent PAR evaluation (page 4) to help determine the correct PAR to issue based on plant conditions, release status, evacuation impediments and offsite dose assessment.

ATTACHMENT 6

PROTECTIVE ACTION RECOMMENDATIONS (PARs)FOR GENERAL EMERGENCY

PAR Flow Chart - Page 1

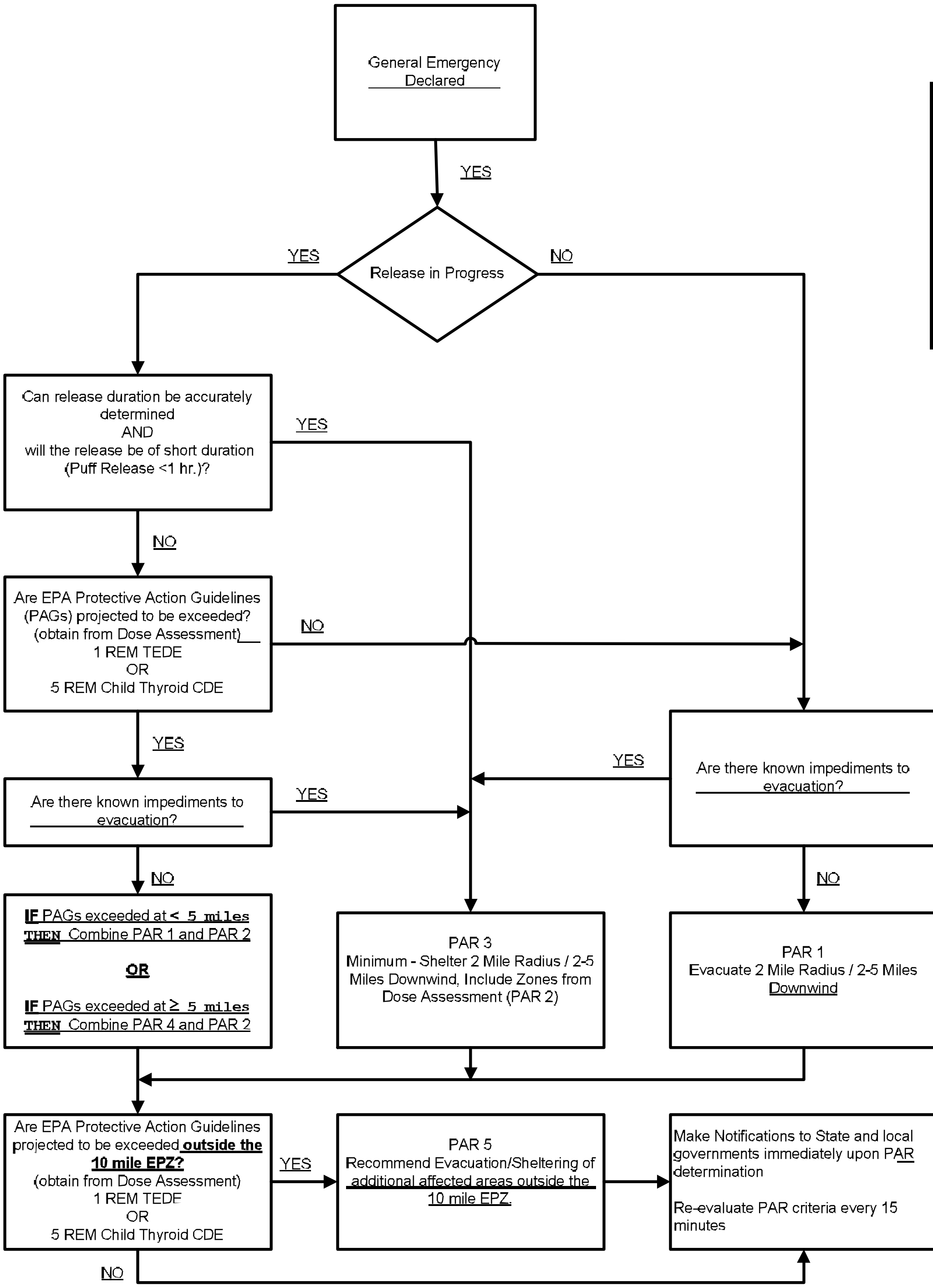
(A Guide for Determining PARs)



ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

PAR Flow Chart - Page 2

(A Guide for Determining PARs)



NOTE

IF Wind Shifts are forecasted, THEN PAR No. 6 shall be reviewed to assist with final PAR determination.

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

PAR No. 1
EVACUATE

NOTE
State and local governments must be notified within **15 minutes** of PARs or changes to PARs using Form 1903.011-Y.

1. Entry Conditions

   General Emergency Declared

2. Recommend the following Protective Action Recommendations:

   Recommend **evacuation** of 2 mile radius and 2-5 miles downwind. Recommend the remainder of the 10 mile EPZ to go indoors and listen to the emergency broadcast for this event. Include any previously evacuated zones with this PAR. **DO NOT** change any previously evacuated zones to "shelter" or "go indoors" on this PAR.

   Determine the affected zones for the PAR from the chart given below.

Wind Direction (from)	Evacuate Zones	Zones "to go indoors"
348.75 to 11.25	G U	H I J K L M N O P Q R S T
11.25 to 33.75	G R U	H I J K L M N O P Q S T
33.75 to 56.25	G R U	H I J K L M N O P Q S T
56.25 to 78.75	G R U	H I J K L M N O P Q S T
78.75 to 101.25	G N O R	H I J K L M P Q S T U
101.25 to 123.75	G N O R	H I J K L M P Q S T U
123.75 to 146.25	G K N O	H I J L M P Q R S T U
146.25 to 168.75	G K N O	H I J L M P Q R S T U
168.75 to 191.25	G K N	H I J L M O P Q R S T U
191.25 to 213.75	G K	H I J L M N O P Q R S T U
213.75 to 236.25	G K	H I J L M N O P Q R S T U
236.25 to 258.75	G H K	I J L M N O P Q R S T U
258.75 to 281.25	G H K	I J L M N O P Q R S T U
281.25 to 303.75	G H K U	I J L M N O P Q R S T
303.75 to 326.25	G H U	I J K L M N O P Q R S T
326.25 to 348.75	G H U	I J K L M N O P Q R S T

3. Reassess PARs every **15 minutes** until downgrade or recovery phase is entered.

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

PAR No. 2
EVACUATE

NOTE
State and local governments must be notified within **15 minutes** of PARs or changes to PARs using Form 1903.011-Y.

1. Entry Conditions

General Emergency declared

AND

Dose Assessment projects EPA Protective Action Guidelines (PAGs) exceeded

1 Rem TEDE OR 5 Rem Child Thyroid CDE

2. Recommend the following Protective Action Recommendation:

NOTE
If there are known impediments to evacuation, then consider "sheltering" of the affected zones versus evacuation.

2.1 **IF** PAGs are exceeded at ≥ 5 miles
THEN recommend the following PAR:
- **EVACUATE** zones from **PAR 4**
- **EVACUATE** any additional [1]ZONES projected by dose assessment to exceed the EPA PAGs (obtain from dose assessment).
- Remainder of the 10 mile EPZ to go indoors and listen to the Emergency Broadcasts

2.2 **IF** PAGs are exceeded at < 5 miles,
THEN recommend the following PAR:
- **EVACUATE** zones from **PAR 1**
- **EVACUATE** any additional [1]ZONES projected by dose assessment to exceed the EPA PAGs (obtain from dose assessment).
- Remainder of the 10 mile EPZ to go indoors and listen to the Emergency Broadcasts

3. Include any previously evacuated zones on this PAR. **DO NOT** change any previously evacuated zones to "shelter" or "go indoors" on this PAR.

4. Reassess PARs every **15 minutes** until downgrade or recovery phase is entered.

[1]Dose assessment PARs will be initially provided by the Initial Dose Assessor in the Control Room. When the Dose Assessors becomes operational in the EOF, they will provide this information.

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

PAR No. 3
Shelter

NOTE
State and local governments must be notified within **15 minutes** of PARs or changes to PARs using Form 1903.011-Y.

1. Entry Conditions

   General Emergency declared
   AND
   Known Impediments to Evacuation exist
   OR
   Offsite Release is a Puff Release (< 1 hour in duration)

2. Recommend the following Protective Action Recommendation:

   Recommend **sheltering** a 2 mile radius and 2-5 miles downwind. Recommend the remainder of the 10-mile EPZ to go indoors and listen to the emergency broadcast for this event. Determine the affected zones for the PAR from the chart given below. **Include any zones recommended for evacuation by Dose Assessment.** **DO NOT** change any previously evacuated zones to "shelter" or "go indoors" on this PAR.

   Determine the affected zones for the PAR from the chart given below.

Wind Direction (from)	Shelter Zones	Zones "to go indoors"
348.75 to 11.25	G U	H I J K L M N O P Q R S T
11.25 to 33.75	G R U	H I J K L M N O P Q S T
33.75 to 56.25	G R U	H I J K L M N O P Q S T
56.25 to 78.75	G R U	H I J K L M N O P Q S T
78.75 to 101.25	G N O R	H I J K L M P Q S T U
101.25 to 123.75	G N O R	H I J K L M P Q S T U
123.75 to 146.25	G K N O	H I J L M P Q R S T U
146.25 to 168.75	G K N O	H I J L M P Q R S T U
168.75 to 191.25	G K N	H I J L M O P Q R S T U
191.25 to 213.75	G K	H I J L M N O P Q R S T U
213.75 to 236.25	G K	H I J L M N O P Q R S T U
236.25 to 258.75	G H K	I J L M N O P Q R S T U
258.75 to 281.25	G H K	I J L M N O P Q R S T U
281.25 to 303.75	G H K U	I J L M N O P Q R S T
303.75 to 326.25	G H U	I J K L M N O P Q R S T
326.25 to 348.75	G H U	I J K L M N O P Q R S T

3. PARs must be reassessed every **15 minutes** until downgrade or recovery phase is entered.

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

PAR No. 4
EVACUATE

NOTE
State and local governments must be notified within **15 minutes** of PARs or changes to PARs using Form 1903.011-Y.

1. Entry Conditions

General Emergency Declared
AND
EPA Protective Action Guidelines (PAGs) are projected to be exceeded **5-10 miles downwind**.

1 Rem TEDE
OR
5 Rem Child Thyroid CDE

2. Recommend the following Protective Action Recommendation:

Recommend **evacuation** of 2 mile radius and 2-10 miles downwind. Recommend that the remainder of the 10-mile EPZ go indoors and listen to the emergency broadcasts for this event. Include any previously evacuated zones with this PAR. **DO NOT** change any previously evacuated zones to "shelter" or "go indoors" on this PAR.

Determine the affected zones for the PAR from the chart given below.

Wind Direction (from)	Evacuate Zones	Zones "to go indoors"
348.75 to 11.25	G U S T	H I J K L M N O P Q R
11.25 to 33.75	G Q R S U	H I J K L M N O P T
33.75 to 56.25	G Q R S U	H I J K L M N O P T
56.25 to 78.75	G Q R S U	H I J K L M N O P T
78.75 to 101.25	G N O P Q R	H I J K L M S T U
101.25 to 123.75	G N O P Q R	H I J K L M S T U
123.75 to 146.25	G K M N O P	H I J L Q R S T U
146.25 to 168.75	G K M N O P	H I J L Q R S T U
168.75 to 191.25	G K M N O P	H I J L Q R S T U
191.25 to 213.75	G K L M	H I J N O P Q R S T U
213.75 to 236.25	G J K L M	H I N O P Q R S T U
236.25 to 258.75	G H I J K L M	N O P Q R S T U
258.75 to 281.25	G H I J K L	M N O P Q R S T U
281.25 to 303.75	G H I J K U	L M N O P Q R S T
303.75 to 326.25	G H I J S T U	K L M N O P Q R
326.25 to 348.75	G H I S T U	J K L M N O P Q R

3. Reassess PARs every **15 minutes** until downgrade or recovery phase is entered.

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

PAR No. 5
Outside the 10 Mile EPZ

NOTE
Protective Action Recommendations beyond the 10-mile EPZ shall be coordinated with State and local government officials.

1. Entry Conditions

General Emergency declared
AND
EPA Protective Action Guidelines (PAGs) are projected to be exceeded **outside the 10-mile EPZ**.

1 Rem TEDE
OR
5 Rem Child Thyroid CDE

2. Recommend the following Protective Action Recommendation:

Recommend **evacuation** of the affected areas. If known impediments to evacuation exist consider sheltering of the affected area.

Use dose assessment personnel to determine the affected sector(s) and downwind distances and then use the chart below to determine the affected area(s) to evacuate.

Affected Sector(s)	**Evacuate/Shelter Sectors**	**Distance from Site**
1	16, 1, 2	10 miles to (Determined by Dose Assessment)
2	1, 2, 3	10 miles to (Determined by Dose Assessment)
3	2, 3, 4	10 miles to (Determined by Dose Assessment)
4	3, 4, 5	10 miles to (Determined by Dose Assessment)
5	4, 5, 6	10 miles to (Determined by Dose Assessment)
6	5, 6, 7	10 miles to (Determined by Dose Assessment)
7	6, 7, 8	10 miles to (Determined by Dose Assessment)
8	7, 8, 9	10 miles to (Determined by Dose Assessment)
9	8, 9, 10	10 miles to (Determined by Dose Assessment)
10	9, 10, 11	10 miles to (Determined by Dose Assessment)
11	10, 11, 12	10 miles to (Determined by Dose Assessment)
12	11, 12, 13	10 miles to (Determined by Dose Assessment)
13	12, 13, 14	10 miles to (Determined by Dose Assessment)
14	13, 14, 15	10 miles to (Determined by Dose Assessment)
15	14, 15, 16	10 miles to (Determined by Dose Assessment)
16	15, 16, 1	10 miles to (Determined by Dose Assessment)

3. Reassess PARs every **15 minutes** until downgrade or recovery phase is entered.

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

PAR No. 6
Wind Shift PAR Determination

NOTE
A wind shift is defined as any change in 10-minute averaged wind direction that affects new offsite protective action zones that are 2-5 or 5-10 miles downwind.

1. Entry Conditions

   General Emergency Declared

   AND

   Previous PAR has been issued

   AND

   Actual/Forecasted Wind Shift

2. **IF** the conditions in 2.1 through 2.3 below are met, **THEN** revise PARs based on dose assessment results only. Go to Step 4.

   2.1 Plant conditions are well understood and changes can be reasonably predicted.

   2.2 Radiological releases have a high degree of predictability in terms of isotopic composition, release pathway, and release rate.

   2.3 Meteorological conditions for the projected duration of the release are well understood.

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

3. **IF** the conditions described in 2.1 through 2.3 above are not met **AND** an actual wind shift occurs **OR** is forecasted to occur within 6 hours, **THEN**

   STEP 1 – Wind Direction Transition Area: Evacuate any additional zones projected to exceed the EPA PAGs (obtain from dose assessment).

   STEP 2 – Final Wind Direction: Revise the current PAR to include any downwind zones using the table below. If conditions warrant, evacuation out to 10 miles may be necessary. Refer to PAR 5, as needed, to determine those areas located outside of the 10-mile EPZ.

Wind Direction (from)	2-5 Miles Downwind Zones	5-10 Miles Downwind Zones
348.75 to 11.25	U	S T
11.25 to 33.75	R U	Q S
33.75 to 56.25	R U	Q S
56.25 to 78.75	R U	Q S
78.75 to 101.25	N O R	P Q
101.25 to 123.75	N O R	P Q
123.75 to 146.25	K N O	M P
146.25 to 168.75	K N O	M P
168.75 to 191.25	K N	M P
191.25 to 213.75	K	L M
213.75 to 236.25	K	J L M
236.25 to 258.75	H K	I J L M
258.75 to 281.25	H K	I J L
281.25 to 303.75	H K U	I J
303.75 to 326.25	H U	I J S T
326.25 to 348.75	H U	I S T

4. Reassess PARs every **15 minutes** until downgrade or recovery phase is entered.

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

PAR No. 7
EVACUATE

NOTE
State and local governments must be notified within **15 minutes** of PARs or changes to PARs using Form 1903.011-Y.

1. Entry Conditions

   General Emergency Declared
   AND
   A rapidly progressing severe accident is in progress

2. Recommend the following Protective Action Recommendation:

   Recommend **evacuation** of 2 mile radius and 2-5 miles downwind. Recommend shelter for 5-10 miles downwind. Recommend that the remainder of the 10-mile EPZ go indoors and listen to the emergency broadcasts for this event.

   Determine the affected zones for the PAR from the chart given below.

Wind Direction (from)	Evacuate Zones	Shelter Zones	Zones "to go indoors"
348.75 to 11.25	G U	S T	H I J K L M N O P Q R
11.25 to 33.75	G R U	Q S	H I J K L M N O P T
33.75 to 56.25	G R U	Q S	H I J K L M N O P T
56.25 to 78.75	G R U	Q S	H I J K L M N O P T
78.75 to 101.25	G N O R	P Q	H I J K L M S T U
101.25 to 123.75	G N O R	P Q	H I J K L M S T U
123.75 to 146.25	G K N O	M P	H I J L Q R S T U
146.25 to 168.75	G K N O	M P	H I J L Q R S T U
168.75 to 191.25	G K N O	M P	H I J L Q R S T U
191.25 to 213.75	G K	L M	H I J N O P Q R S T U
213.75 to 236.25	G K	J L M	H I N O P Q R S T U
236.25 to 258.75	G H K	I J L M	N O P Q R S T U
258.75 to 281.25	G H K	I J L	M N O P Q R S T U
281.25 to 303.75	G H K U	I J	L M N O P Q R S T
303.75 to 326.25	G H U	I J S T	K L M N O P Q R
326.25 to 348.75	G H U	I S T	J K L M N O P Q R

ATTACHMENT 6
PROTECTIVE ACTION RECOMMENDATIONS (PARs)
FOR GENERAL EMERGENCY

NOTE

Changing the recommendation for areas 5-10 miles downwind from shelter to evacuate is the responsibility of the EOF and will not be performed in the Control Room.

3. A recommendation of evacuation of 5-10 miles downwind should only be considered when safer to do so (when the EOF and state and local EOCs are staffed and operational AND the release source term has significantly reduced (i.e., a reduction of 25% or more))

    a. A change in recommendation may be considered based on a change in wind direction with site wind variability taken into account.

    b. The decision to change the recommendation relies ultimately upon the judgment of decision makers at the time of the event.

4. Reassess PARs every **15 minutes** until downgrade or recovery phase is entered.

Facility: Arkansas Nuclear One Unit 2 Date of Examination: 08/24/2015

Exam Level: RO X SRO-I ☐ SRO-U ☐ Operating Test No.: 2015-1

Control Room Systems:* 8 for RO; 7 for SRO-I; 2 or 3 for SRO-U

System / JPM Title	Type Code*	Safety Function
S1. ANO-2-JPM-NRC-HPSI1 006 A1.17; RO-4.2/SRO-4.3 Align HPSI for Hot leg injection	A/D/EN/L/S	2 Inventory Control
S2. ANO-2-JPM-NRC-H2003 028 A4.01; RO-4.0/SRO-4.0 Start up a Hydrogen Recombiner	L/M/S	5 Containment
S3. ANO-2-JPM-NRC-CVCS2 004 A4.07; RO-3.9/SRO3.7 Perform Emergency Boration	A/D/L/P/S	1 Reactivity control
S4. ANO-2-JPM-NRC-EFW01 061 A1.01; RO-3.9/SRO4.2 Shutdown EFW Train ‘A’ with EFAS Signal Present	D/EN/L/P/S	4 Heat Removal Secondary
S5. ANO-2-JPM-NRC-PZR08 010 A2.02; RO-3.9/SRO-3.9 Initiate Auxiliary Spray	A/M/S	3 Pressure Control
S6. ANO-2-JPM-NRC-FP02 086 A4.02; RO-3.5, SRO-3.5 Respond to a Fire Panel alarm.	N/S	8 Plant Service systems
S7. ANO-2-JPM-NRC-ELECXT 062 A4.01; RO-3.3/SRO-3.1 Cross connect 2B-1 and 2B-2.	A/D/S	6 Electrical
S8. ANO-2-JPM-NRC-CEA02 012 A4.06 ; RO-4.3/SRO-4.3 Test a Reactor Trip Circuit Breaker	D/S	7 Instrumentation

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

System / JPM Title	Type Code*	Safety Function
P1. ANO-2-JPM-NRC-SFPFL 033 A2.03: RO-3.1/SRO3.5 Line up to fill the spent fuel pool from CVCS.	E/D/R	8 Plant Service systems
P2. ANO-2-JPM-NRC-DC01 063 A4.01; RO-2.8/SRO-3.1 Swap in-service Battery Chargers.	A/N	6 Electrical
P3. ANO-2-JPM-NRC-TLOF CE E06 EA2.2; RO-3.0/SRO-4.2 Perform Local Actions to start ‘D’ Condensate pump during a Loss of Feedwater.	D/E/L	4 Heat Removal Secondary

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all five 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 / ≥1 / ≥ 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: 08/24/2015

Exam Level: RO ☐ SRO-I X SRO-U ☐ Operating Test No.: 2015-1

Control Room Systems:* 8 for RO; 7 for SRO-I; 2 or 3 for SRO-U

System / JPM Title	Type Code*	Safety Function
S1. ANO-2-JPM-NRC-HPSI1 006 A1.17; RO-4.2/SRO-4.3 Align HPSI for Hot leg injection	A/D/EN/L/S	2 Inventory Control
S2. ANO-2-JPM-NRC-H2003 028 A4.01; RO-4.0/SRO-4.0 Start up a Hydrogen Recombiner	L/M/S	5 Containment
S3. ANO-2-JPM-NRC-CVCS2 004 A4.07; RO-3.9/SRO3.7 Perform Emergency Boration	A/D/L/P/S	1 Reactivity control
S4. ANO-2-JPM-NRC-EFW01 061 A1.01; RO-3.9/SRO4.2 Shutdown EFW Train 'A' with EFAS Signal Present	D/EN/L/P/S	4 Heat Removal Secondary
S5. ANO-2-JPM-NRC-PZR08 010 A2.02; RO-3.9/SRO-3.9 Initiate Auxiliary Spray	A/M/S	3 Pressure Control
S6. ANO-2-JPM-NRC-FP02 086 A4.02; RO-3.5, SRO-3.5 Respond to a Fire Panel alarm.	N/S	8 Plant Service systems
S7. ANO-2-JPM-NRC-ELECXT 062 A4.01; RO-3.3/SRO-3.1 Cross connect 2B-1 and 2B-2.	A/D/S	6 Electrical

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

System / JPM Title	Type Code*	Safety Function
P1. ANO-2-JPM-NRC-SFPFL 033 A2.03: RO-3.1/SRO3.5 Line up to fill the spent fuel pool from CVCS.	E/D/R	8 Plant Service systems
P2. ANO-2-JPM-NRC-DC01 063 A4.01; RO-2.8/SRO-3.1 Swap in-service Battery Chargers.	A/N	6 Electrical
P3. ANO-2-JPM-NRC-TLOF CE E06 EA2.2; RO-3.0/SRO-4.2 Perform Local Actions to start 'D' Condensate pump during a Loss of Feedwater.	D/E/L	4 Heat Removal Secondary

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all five 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 / ≥1 / ≥ 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: 08/24/2015

Exam Level: RO ☐ SRO-I ☐ SRO-U X Operating Test No.: 2015-1

Control Room Systems:* 8 for RO; 7 for SRO-I; 2 or 3 for SRO-U

System / JPM Title	Type Code*	Safety Function
S1. ANO-2-JPM-NRC-HPSI1 006 A1.17; RO-4.2/SRO-4.3 Align HPSI for Hot leg injection	A/D/EN/L/S	2 Inventory Control
S2. ANO-2-JPM-NRC-H2003 028 A4.01; RO-4.0/SRO-4.0 Start up a Hydrogen Recombiner	L/M/S	5 Containment
S3. ANO-2-JPM-NRC-CVCS2 004 A4.07; RO-3.9/SRO3.7 Perform Emergency Boration	A/D/L/P/S	1 Reactivity control

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

System / JPM Title	Type Code*	Safety Function
P1. ANO-2-JPM-NRC-SFPFL 033 A2.03: RO-3.1/SRO3.5 Line up to fill the spent fuel pool from CVCS.	E/D/R	8 Plant Service systems
P2. ANO-2-JPM-NRC-DC01 063 A4.01; RO-2.8/SRO-3.1 Swap in-service Battery Chargers.	A/N	6 Electrical

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all five 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 / ≥1 / ≥ 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 #: 013 DATE: ____________

SYSTEM/DUTY AREA: Safety Injection System

TASK: Align HPSI System for Hot Leg Injection

JTA#: ANO2-RO-EOPAOP-EMERG-13

Alternate Path Yes: X No: ____ Time Critical Yes: ____ No: X

KA VALUE RO: 4.2 SRO: 4.3 KA REFERENCE: 006 A1.17

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

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

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ____ SIMULATOR: Perform LAB: ____

POSITION EVALUATED: RO: ____ SRO: ____

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

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): OP 2202.010 Standard Attachment 12

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 ____

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- A LOCA has been in progress for 3 hours.
- RCS MTS > 40°F.
- PZR level <29%.
- RVLMS LVL 01 indicates WET.
- Shutdown Cooling can NOT be established within four (4) hours of the start of the LOCA.

TASK STANDARD:

- Closed the red train orifice bypass valve
- Opened both Hot Leg injection valves
- Determined Total flow, Cold Leg flow range, actual Cold Leg flow, actual cold leg flow not in the acceptable range
- Determined Green train HPSI system is affected and throttled the Green Train Hot Leg injection MOV to establish Cold Leg flow in the acceptable range.

TASK PERFORMANCE AIDS:

OP-2202.010 Standard Attachment 12; Calculator

SIMULATOR SETUP:

LOCA in progress. Both HPSI pumps running.

Close the breakers for 2CV5102-2 2B62 G2 (HPIB62G2) and 2CV5101-1 2B52 L5 (HPIB52L5). (This will allow the examiner to report that the breakers are closed on these valves (Step 1 of JPM).

Override 2CV5104-2 to deenergize the lights when operator closes the valve. It will stick at 25%.

Set a conditional trigger to NF4G1042 (2CV-5104-2 green light)
Set a trigger for CV51042 to .25, 15 second time delay.
Set a trigger for DO_HS_5104_R to off, 15 second time delay.
Set a trigger for DO_HS_5104_G to off, 15 second time delay.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs you to establish hot leg injection using EOP 2202.010 Attachment 12.

START Time: ________________

<table>
<tr><th colspan="3">PERFORMANCE CHECKLIST</th><th>STANDARDS</th><th>(Circle One)</th></tr>
<tr><td colspan="5">EXAMINER'S NOTE:
Breakers must be closed from simulator instructor's console.</td></tr>
<tr><td></td><td>1.
(Step 1)</td><td>Locally clear danger tags AND close the following breakers:
• 2B52-L5 "2CV-5101-1, HOT LEG INJ VALVE"
• 2B62-G2 "2CV-5102-2, HOT LEG INJ VALVE"

CUE:
Report as a NLO that breakers 2B52-L5 and 2B62-G2 are closed.</td><td>Directed WCO to clear danger tags, unlock and close 2B52-L5 and 2B62-G2.

Acknowledged report from WCO that 2B52-L5 and 2B62-G2 are CLOSED.</td><td>N/A SAT UNSAT</td></tr>
<tr><td colspan="5">Examiner's Note: When 2CV-5104-2 is taken to closed position, after a 15 second time delay, the valve breaker will trip leaving 2CV-5104-2 in mid position.</td></tr>
<tr><td>(C)</td><td>2.
(Step 2)</td><td>Close HPSI Header Orifice Bypass valves:
• 2CV-5103-1
• 2CV-5104-2

CUE:
If requested report that breaker for 2CV-5104-2 breaker 2B62-H2 is tripped.
If requested report 2CV-5104-2 valve is in mid position.
If requested report that 2CV-5104-2 will not move the hand wheel spins freely.</td><td>On panel 2C16, placed hand switch for 2CV-5104-2 "CLOSE".

Critical portion: On panel 2C17, closed 2CV-5103-1.

Observed green light ON; red light OFF for 2CV-5103-1

AND

Green light OFF, Red light OFF for 2CV-5104-2.</td><td>N/A SAT UNSAT</td></tr>
<tr><td colspan="5">Procedure caution:

HPSI pump flow greater than 800 gpm indicates pump flow in excess of NPSH requirements. (ER-ANO-2002-0528-000)</td></tr>
</table>

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	3. (Step 3)	IF individual HPSI header flow greater than 800 gpm, THEN throttle associated Cold Leg Injection valves equally on affected train to lower flow to less than 800 gpm.	Determined step 3 was not applicable.	N/A SAT UNSAT
(C)	4. (Step 4)	Open BOTH Hot Leg Injection valves • 2CV-5101-1 • 2CV-5102-2	On panel 2C16, opened 2CV-5102-2. On panel 2C17, opened 2CV-5101-1. Observed green light OFF; red light ON above each handswitch.	N/A SAT UNSAT
EXAMINER'S NOTE: **Simulator conditions will vary slightly during performance of this JPM due to the dynamic nature of the evolution. If conditions change, record values to check applicant's performance and adjust acceptable range.**				
(C)	5. (Step 5)	Record HPSI Header flows AND add values to calculate Total HPSI Header flow: • 2FI-5101 "HEADER 1" ________. • 2FI-5102 "HEADER 2" ________. Total HPSI Header flow = __________. **Examiner Note:** Header #1 flow ~ 500gpm. **Examiner Note:** Header #2 flow ~ 500gpm. **Examiner Note:** Total HPSI flow ~ 1000 GPM	Recorded HPSI Header #1 flow (2FI-5101-1 or F5101-1) on Attachment 12. Recorded HPSI Header #2 flow (2FI-5102-1 or F5102-1) on Attachment 12. Added "HEADER 1" flow to "HEADER 2" flow to obtain "Total HPSI Header flow". Recorded sum on Attachment 12 as "Total HPSI Header flow" **Examiner Note:** Critical portions above are obtaining required values.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

<table>
<tr><th colspan="3">PERFORMANCE CHECKLIST</th><th>STANDARDS</th><th>(Circle One)</th></tr>
<tr><td>(C)</td><td>6.
(Step 6)</td><td>Perform the following calculation to determine acceptable band for Total HPSI Cold Leg Injection flow:

A. [Total HPSI Header flow (Step 5)] X 0.60 = MAX FLOW

[______________] X 0.60 = ______.

B. [Total HPSI Header flow (Step 5)] X 0.40 = MIN FLOW

[______________] X 0.40 = ______.

Examiner Note:
MAX FLOW: ~ 600 gpm

Examiner Note:
MIN FLOW: ~ 400 gpm</td><td>Multiplied Total HPSI Header flow by 0.60 to obtain maximum Total HPSI Cold Leg Injection flow.

Multiplied Total HPSI Header flow by 0.40 to obtain minimum Total HPSI Cold Leg Injection flow.

Recorded maximum and minimum Total HPSI Cold Leg Injection flow on Attachment 12.

Examiner Note:
Critical portions above obtaining the minimum and maximum acceptable band.</td><td>N/A SAT UNSAT</td></tr>
<tr><td>(C)</td><td>7.
(Step 7)</td><td>Record HPSI Cold Leg Injection flows AND add values to calculate
Total HPSI Cold Leg Injection flow:

• 2FI-5014-1:________.

• 2FI-5034-1:________.

• 2FI-5054-2:________.

• 2FI-5074-2:________.

Total HPSI Cold Leg Injection flow = ______.</td><td>Recorded HPSI Flow to 2P32A (2FI-5014-1 or F5014-1).

Recorded HPSI Flow to 2P32B (2FI-5034-1 or F5034-1).

Recorded HPSI Flow to 2P32C (2FI-5054-2 or F5054-2).

Recorded HPSI Flow to 2P32D (2FI-5074-2 or F5074-2).

Added HPSI Cold Leg Injection flows to obtain Total HPSI Cold Leg Injection flow.

Examiner Note:
Critical portions above are obtaining the required values.</td><td>N/A SAT UNSAT</td></tr>
</table>

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	8. (Step 8)	IF Total HPSI Cold Leg Injection flow in Step 7 NOT within acceptable band calculated in Step 6, THEN perform ONE of the following: **Examiner Note:** Cold leg flow is too low (~355 gpm).	Determined total HPSI Cold Leg Injection flow NOT within the range established by Maximum and Minimum Total HPSI Cold Leg Injection flow.	N/A SAT UNSAT
Procedure Note: Affected train of HPSI is any train where the HPSI Header Orifice Bypass valve or Hot Leg Injection valve does not move to its required position.				
(C)	9. (Step 8.A)	IF EITHER HPSI train affected, THEN perform the following: 1) IF Total HPSI Cold Leg Injection flow greater than MAX FLOW value calculated in Step 6.A, THEN throttle associated Cold Leg Injection valves equally on affected train. 2) IF Total HPSI Cold Leg Injection flow less than MIN FLOW value calculated in Step 6.B, THEN throttle Hot Leg Injection valve on affected train. 3) IF only ONE HPSI train operating, AND Cold Leg Injection valves throttled, THEN check total HPSI flow acceptable using Exhibit 2, HPSI Flow Curve.	**Determined that green train HPSI is affected.** Determined that Cold leg flow is not greater than the MAX FLOW value. **Determined that cold leg injection flow is less than MIN FLOW value and throttled closed 2CV-5102-2 to raise flow into the acceptable band calculated value is step 6.** Determined that both HPSI trains are operating. **Examiner Note:** Critical portions above are bolded.	N/A SAT UNSAT
	10. (Step 8.B)	Throttle both Hot Leg Injection valves to establish Total HPSI Cold Leg Injection flow within acceptable band.	Determined that step is Not applicable due to one HPSI train being affected.	N/A SAT UNSAT
END				

STOP Time: ___________________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- A LOCA has been in progress for 3 hours.
- RCS MTS >40°F.
- PZR level <29%.
- RVLMS LVL 01 indicates WET.
- Shutdown Cooling can NOT be established within four (4) hours of the start of the LOCA.

INITIATING CUE:

The SM/CRS directs you to establish hot leg injection using EOP 2202.010 Attachment 12.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- A LOCA has been in progress for 3 hours.
- RCS MTS >40°F.
- PZR level <29%.
- RVLMS LVL 01 indicates WET.
- Shutdown Cooling can NOT be established within four (4) hours of the start of the LOCA.

INITIATING CUE:

The SM/CRS directs you to establish hot leg injection using EOP 2202.010 Attachment 12.

ATTACHMENT 12
HOT LEG INJECTION

1. Locally clear danger tags AND close the following breakers:

   - 2B52-L5 "2CV-5101-1, HOT LEG INJ VALVE"
   - 2B62-G2 "2CV-5102-2, HOT LEG INJ VALVE"

2. Close HPSI Header Orifice Bypass valves:

   - 2CV-5103-1
   - 2CV-5104-2

CAUTION
HPSI pump flow greater than 800 gpm indicates pump flow in excess of NPSH requirements. (ER-ANO-2002-0528-000)

3. IF individual HPSI header flow greater than 800 gpm,
   THEN throttle associated Cold Leg Injection valves equally on affected train to lower flow to less than 800 gpm.

4. Open both Hot Leg Injection valves:

   - 2CV-5101-1
   - 2CV-5102-2

5. Record HPSI Header flows AND add values to calculate Total HPSI Header flow:

   - 2FI-5101 "HEADER 1": _________.
   - 2FI-5102 "HEADER 2": _________.

   Total HPSI Header flow = _________.

6. Perform the following calculation to determine acceptable band for Total HPSI Cold Leg Injection flow:

   A. [Total HPSI Header flow (Step 5)] X 0.60 = MAX FLOW

   [___________________________] X 0.60 = ______.

   B. [Total HPSI Header flow (Step 5)] X 0.40 = MIN FLOW

   [___________________________] X 0.40 = ______.

7. Record HPSI Cold Leg Injection flows AND add values to calculate Total HPSI Cold Leg Injection flow:

   - 2FI-5014-1: _______.
   - 2FI-5034-1: _______.
   - 2FI-5054-2: _______.
   - 2FI-5074-2: _______.

   Total HPSI Cold Leg Injection flow = _______.

8. IF Total HPSI Cold Leg Injection flow in Step 7 NOT within acceptable band calculated in Step 6,
   THEN perform ONE of the following:

NOTE
Affected HPSI train is ANY train where HPSI Header Orifice Bypass valve or Hot Leg Injection valve does NOT move to its required position.

   A. IF EITHER HPSI train affected, THEN perform the following:

      1) IF Total HPSI Cold Leg Injection flow greater than MAX FLOW value calculated in Step 6.A,
         THEN throttle associated Cold Leg Injection valves equally on affected train.

      2) IF Total HPSI Cold Leg Injection flow less than MIN FLOW value calculated in Step 6.B,
         THEN throttle Hot Leg Injection valve on affected train.

      3) IF only ONE HPSI train operating, AND Cold Leg Injection valves throttled,
         THEN check total HPSI flow acceptable using Exhibit 2, HPSI Flow Curve.

   B. Throttle both Hot Leg Injection valves to establish Total HPSI Cold Leg Injection flow within acceptable band.

JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 002 DATE: ____________

SYSTEM/DUTY AREA: Hydrogen Recombiner

TASK: Start Up a Hydrogen Recombiner

JTA#: ANO2-RO-CONH2-NORM-3

Alternate Path Yes: ______ No: X Time Critical Yes: ______ No: X

KA VALUE RO: 4.0 SRO: 4.0 KA REFERENCE: 028 A4.01

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 LAB: ____________

POSITION EVALUATED: RO: ____________ SRO: ____________

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

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 20 Minutes

REFERENCE(S): OP-2104.044 Containment Hydrogen Control 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 ________

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- A LOCA has been in progress for 3 hours.
- Containment Hydrogen is >1%
- TSC has directed to start one hydrogen recombiner
- Pre-LOCA containment temperature was 120 degrees F

TASK STANDARD:

Energized the Green Train Hydrogen recombiner and raised power to the required value (54 to 56KW) to recombine hydrogen and oxygen.

TASK PERFORMANCE AIDS:

OP-2104.044 Containment Hydrogen Control Operations

SIMULATOR SETUP:

LOCA in progress.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs you to place 2M055B Hydrogen Recombiner in service using OP-2104.044 starting with step 9.2.

START TIME:_______________

PERFORMANCE CHECKLIST			STANDARD	(Circle One)
	1. (Step 9.2.1)	Verify Power Out switch in OFF.	Verifies Power Out switch in OFF or down position.	N/A SAT UNSAT
	2. (Step 9.2.2)	Verify Power Adjust potentiometer (2POTR-6891) set to zero (000):	On 2C184 Verifies Power Adjust potentiometer (2POTR-6891) set to zero (000).	N/A SAT UNSAT
	3. (Step 9.2.3)	Verify H2 Recombiner #2 supply breaker (2B-633) closed: **Examiner Cue:** **When contacted as NLO report that 2B-633 breaker is closed.**	Contacts a NLO to verify that breaker 2B-633 is closed.	N/A SAT UNSAT
	4. (Step 9.2.4)	Check white Power Available light illuminated.	On 2C184, checks white power light illuminated.	N/A SAT UNSAT
(C)	5. (Step 9.2.5)	Place Power Out switch to ON.	On 2C184, placed power out switch in the ON or up position.	N/A SAT UNSAT
(C)	6. (Step 9.2.6)	Turn Power Adjust potentiometer (2POTR-6891) clockwise to raise power to 5 KW as indicated on power meter (2WI-6893).	On 2C184, turned 2POTR-6891 clockwise until ~ 5 KW on 2WI-6893.	N/A SAT UNSAT
	7. (Step 9.2.7)	Using Power Adjust potentiometer (2POTR-6891), maintain power at 5 KW for 10 minutes. **Examiner Cue:** **When comfortable with applicant performance instruct them 10 min have elapsed.**	On 2C184, monitored power meter to ensure power is maintained ~ 5 KW.	N/A SAT UNSAT
(C)	8. (Step 9.2.8)	Using Power Adjust potentiometer (2POTR-6891), raise power to 10 KW (2WI-6893).	On 2C184, turned 2POTR-6891 clockwise until ~ 10 KW on 2WI-6893.	N/A SAT UNSAT

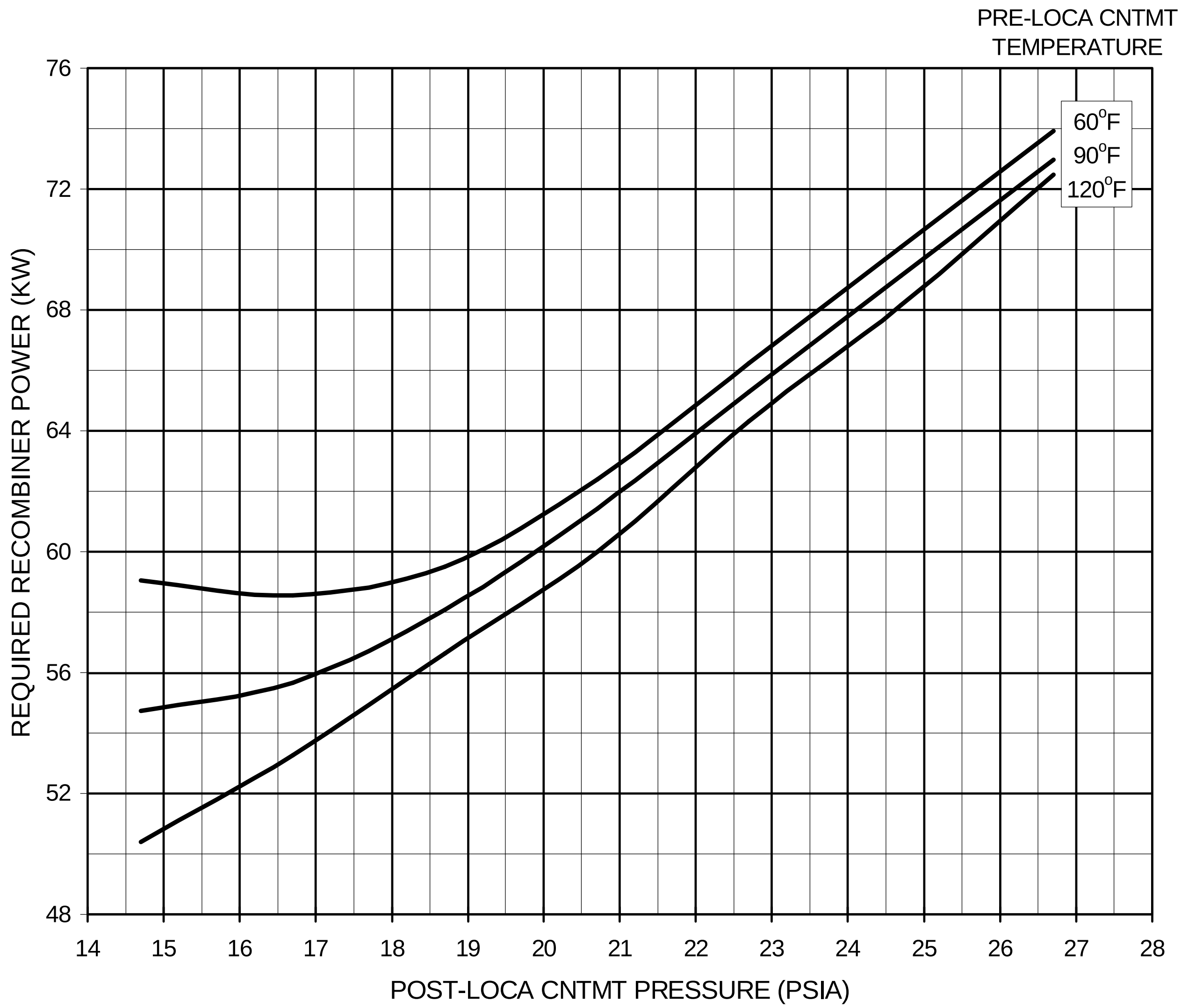
JOB PERFORMANCE MEASURE

	9. (Step 9.2.9)	Using Power Adjust potentiometer (2POTR-6891), maintain power at 10 KW (2WI-6893) for 10 minutes. **Examiner Cue:** **When comfortable with applicant performance instruct them 10 min have elapsed.**	On 2C184, monitored power meter to ensure power is maintained ~ 10 KW.	N/A SAT UNSAT
	10. (Step 9.2.10)	Determine Recombiner Temperature Correction Factor using Attachment C. **Examiner Cue:** **Attachment C has been completed and will be maintained by another operator.**	This attachment will not be completed by the examinee.	N/A SAT UNSAT
(C)	11. (Step 9.2.11)	Using Power Adjust potentiometer (2POTR-6891), raise power to 20 KW (2WI-6893).	On 2C184, turned 2POTR-6891 clockwise until ~ 20 KW on 2WI-6893.	N/A SAT UNSAT
	12. (Step 9.2.12)	Using Power Adjust potentiometer (2POTR-6891), maintain power at 20 KW (2WI-6893) for 5 minutes. **Examiner Cue:** **When comfortable with applicant performance instruct them 5 min have elapsed.**	On 2C184, monitored power meter to ensure power is maintained ~ 20 KW.	N/A SAT UNSAT
Examiner Note: acceptable numbers in the standards based on validation conditions check actual simulator conditions are similar. **Attachment F is at the back of this JPM.**				
(C)	13. (Step 9.2.13)	Determine required Recombiner power using Attachment F of this procedure based on Pre-LOCA CNTMT temperature and Post-LOCA CNTMT pressure. **Examiner Note: Post-LOCA pressure is displayed in the simulator and should be ~ 17.2 psia.**	Examinee determines required Recombiner power is ________ KW from Attachment F. Acceptable value is 53 to 55 KW	N/A SAT UNSAT
(C)	14. (Step 9.2.14)	Using Power Adjust potentiometer (2POTR-6891), raise power (2WI-6893) to value determined in step 9.2.13.	Examinee raises power on 2WI-6893 using 2POTR-6891 to value determined in above step.	N/A SAT UNSAT
Examiner Note: End JPM after examinee has raised power to the Attachment F value.				
END				

Stop time: _______________

JOB PERFORMANCE MEASURE

Procedure 2104.044 Attachment F Recombiner power requirement



EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- A LOCA has been in progress for 3 hours.
- Containment Hydrogen is >1%
- TSC has directed to start one hydrogen recombiner
- Pre-LOCA containment temperature was 120 degrees F

INITIATING CUE:

The SM/CRS directs you to place 2M-55B Hydrogen Recombiner in service using OP-2104.044 starting with step 9.2.

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- A LOCA has been in progress for 3 hours.
- Containment Hydrogen is >1%
- TSC has directed to start one hydrogen recombiner
- Pre-LOCA containment temperature was 120 degrees F

INITIATING CUE:

The SM/CRS directs you to place 2M-55B Hydrogen Recombiner in service using OP-2104.044 starting with step 9.2.

9.2 Perform the following to start Hydrogen Recombiner (2M-55B):

9.2.1 Verify Power Out switch in OFF.

9.2.2 Verify Power Adjust potentiometer (2POTR-6891) set to zero (ØØØ):

9.2.3 Verify H2 Recombiner #2 Supply Breaker (2B-633) closed:

9.2.4 Check white Power Available light illuminated.

9.2.5 Place Power Out switch to ON.

9.2.6 Turn Power Adjust potentiometer (2POTR-6891) clockwise to raise power to 5 KW (2WI-6893).

9.2.7 Using Power Adjust potentiometer (2POTR-6891), maintain power at 5 KW for 10 minutes.

9.2.8 Using Power Adjust potentiometer (2POTR-6891), raise power to 10 KW (2WI-6893).

9.2.9 Using Power Adjust potentiometer (2POTR-6891), maintain power at 10 KW (2WI-6893) for 10 minutes.

9.2.10 Determine Recombiner Temperature Correction Factor using Attachment C of this procedure.

9.2.11 Using Power Adjust potentiometer (2POTR-6891), raise power to 20 KW (2WI-6893).

9.2.12 Using Power Adjust potentiometer (2POTR-6891), maintain power at 20 KW (2WI-6893) for 5 minutes.

9.2.13 Determine required Recombiner power using Attachment F of this procedure based on Pre-LOCA CNTMT temperature and Post-LOCA CNTMT pressure.

9.2.14 Using Power Adjust potentiometer (2POTR-6891), raise power (2WI-6893) to value determined in step 9.2.13.

Step 9.2 continued on next page.

CAUTION

- Do NOT exceed maximum Recombiner output power of 75 KW or functional thermocouple temperature of 1400°F.
- If temperature difference between any two temperature readings exceeds 50°F during steady state operation, the temperatures should NOT be used as an indication of proper operation.

CRITICAL STEP

* 9.2.15 Perform the following:

A. Monitor functional thermocouple temperatures (2TI-6889) every 30 minutes

B. Record functional thermocouple temperatures (2TI-6889) on Attachment C of this procedure.

C. IF 1400°F is exceeded on any functional thermocouple (2TI-6889) on 2C184,
THEN perform the following:

1. Reduce Recombiner power.
2. Investigate cause.
3. Initiate Condition Report.

NOTE

A power change of 1 KW will change temperature approximately 18°F.

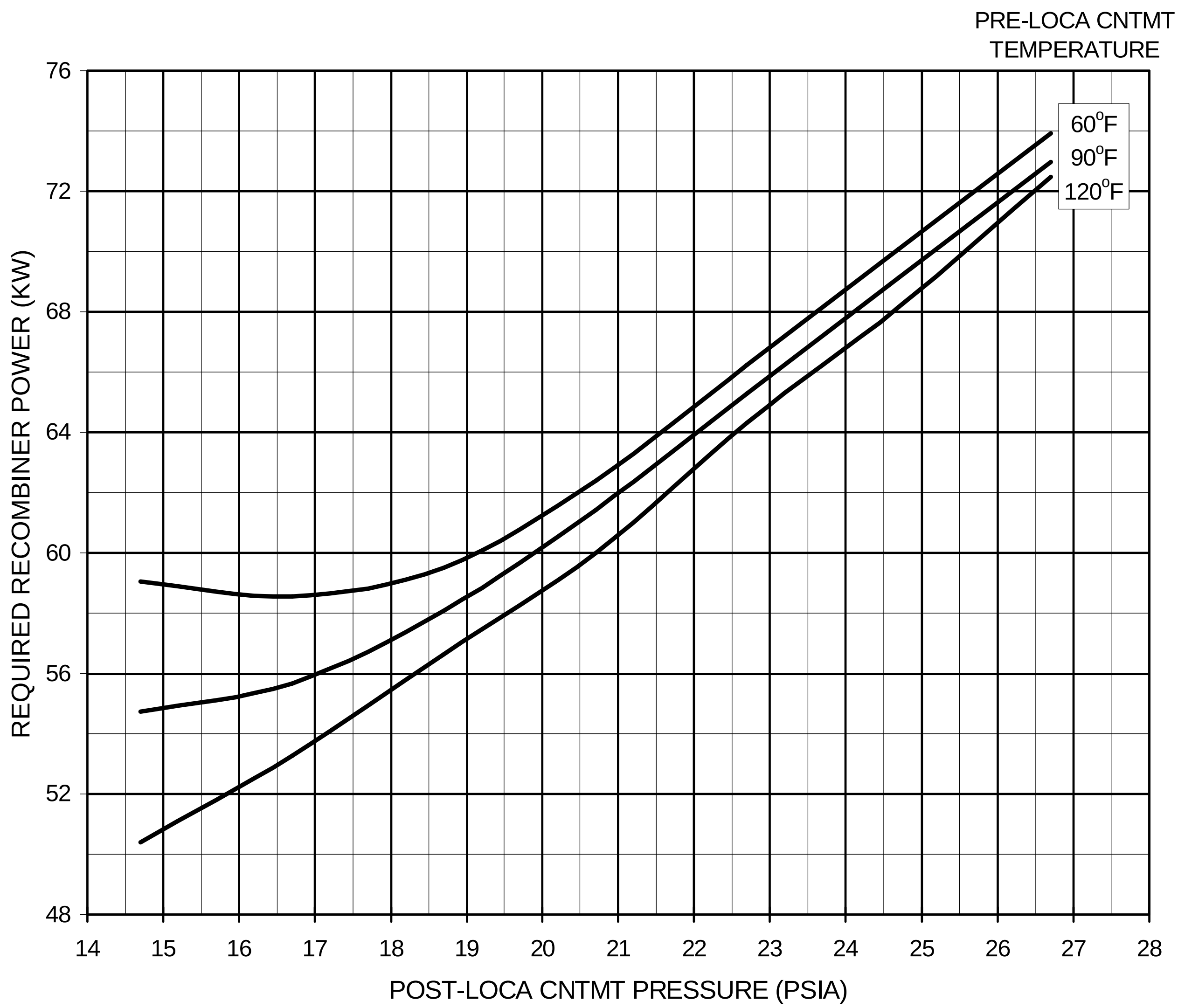
9.2.16 WHEN 2M-55B has operated for greater than or equal to 2 hours,
THEN perform the following to verify proper operation of 2M-55B:

- Check H2 concentration being reduced or maintained at low concentration.
- Verify Recombiner maintaining power at required value.
- Verify Recombiner power less than 75 KW.
- Check average corrected temperature per Attachment C of this procedure is between 1225°F and 1400°F.

9.2.17 IF H2 concentration has risen by greater than 0.5% in 24 hours
OR H2 concentration exceeds 3.0%,
THEN raise Recombiner power 4 KW above previous setting.

ATTACHMENT F

RECOMBINER POWER REQUIREMENT



JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 009 DATE: ____________

SYSTEM/DUTY AREA: Chemical and Volume Control System

TASK: Perform Emergency Boration

JTA#: ANO2-RO-EOPAOP-OFFNORM-193

Alternate Path Yes: X No: ____ Time Critical Yes: ____ No: X

KA VALUE RO: 3.9 SRO: 3.7 KA REFERENCE: 004 A4.07

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

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

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ____________ SIMULATOR: Perform LAB: ____________

POSITION EVALUATED: RO: ____________ SRO: ____________

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

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 6 Minutes

REFERENCE(S): OP-2203.032 Emergency Boration AOP

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 ________

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- Mode 3
- A Shutdown Margin is calculated following a reactor trip
- Shutdown Margin is found to be less than required

TASK STANDARD:

Established boration of greater than or equal to 40 gallons per minute of boric acid solution. At least one BAM pump started and Emergency Borate from BAM pumps valve (2CV-4916-2) opened.

TASK PERFORMANCE AIDS:

OP-2203.032 Steps 2 through 6

SIMULATOR SETUP:

Select desired Mode 3 IC for this JPM.
Set each of the following to occur on a trigger with a 5 second time delay:

- CV48731 = .85 (VCT outlet),
- DO_HS_4873_G (VCT outlet green light) = OFF
- DO_HS_4873_R (VCT outlet red light) = OFF.

Set the trigger event to hg4g8731 (VCT green light coming on).

EXAMINER NOTES:

This is an alternate success path JPM.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs you to initiate emergency boration using BAMT Gravity Feed to Charging pump suction beginning with OP 2203.032, Emergency Boration, Step 2.

START TIME:________________

PERFORMANCE CHECKLIST			STANDARD	(Circle One)
	1. (Step 2)	Verify at least ONE Charging pump running with flow greater than 40 gpm.	On panel 2C09, verified CCP(s) running. Observed red light ON; green light OFF above at least one of the following handswitch(es): 2HS-4832-1, "A" CCP 2HS-4852-1, "C" CCP (red) 2HS-4853-2, "C" CCP (green) 2HS-4842-2, "B" CCP Observed flow greater than 40 gpm on Charging Header Flow (2FIS-4863).	N/A SAT UNSAT
	2. (Step 3.a)	Align Charging pump suction to at least ONE of the following sources: A. Gravity Feed: 1) Open at least ONE BAM Tank Gravity Feed valve: • 2CV-4920-1 • 2CV-4921-1	On panel 2C09, opened BAMT gravity feed valves 2CV-4920-1 **and/or** 2CV-4921-1 Observed red light ON and green light OFF above handswitch(es): • 2HS-4920-1 for 2CV-4920-1 • 2HS-4921-1 for 2CV-4921-1	N/A SAT UNSAT
EXAMINER'S NOTE: Step 3.b and 3.c are not applicable. In the following step the VCT outlet valve will NOT close requiring an alternate success path.				
	3. (Step 4)	Close VCT Outlet valve (2CV-4873-1).	On panel 2C09, observed that 2CV-4873-1 did NOT go closed. Observed green light OFF; red light OFF above VCT Outlet valve handswitch (2HS-4873-1). **Examiner Note:** 2CV-4873-1 breaker will trip causing the lights to go out.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARD	(Circle One)
(C)	4. (Step 4.a)	IF VCT Outlet valve does NOT close, THEN perform the following: Start at least ONE BAM pump.	On panel 2C09, started 2P39A and/or 2P39B. Observed RED light ON above the BAM pump started, 2HS-4919-2 (2P39A) or 2HS-4910-2 (2P39B).	N/A SAT UNSAT
(C)	5. (Step 4.b)	Open Emergency Borate From BAM Pumps valve (2CV-4916-2).	On panel 2C09, opened 2CV-4916-2. Observed red light ON; green light OFF above Emergency borate valve, 2CV-4916-2.	N/A SAT UNSAT
	6. (Step 4.c)	Verify Boric Acid Makeup Flow Control valve (2CV-4926) closed.	On panel 2C09, verified 2CV-4926 closed. Observed green light ON; red light OFF above Boric Acid Makeup Flow Controller (2FIC-4926).	N/A SAT UNSAT
	7. (Step 5)	Check Reactor Makeup Water Flow Control valve (2CV-4927) closed.	On panel 2C09, verified 2CV-4927 closed. Observed green light ON; red light OFF above Reactor Makeup Water Flow Controller (2FIC-4927).	N/A SAT UNSAT
	8. (Step 6)	Check charging header flow indicator (2FIS-4863) greater than 40 gpm.	On panel 2C09 (upright portion), observed flow greater than 40 gpm on Charging Header Flow indicator (2FIS-4863).	N/A SAT UNSAT
END				

STOP TIME:_________________

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- Mode 3
- A Shutdown Margin is calculated following a reactor trip
- Shutdown Margin is found to be less than required

INITIATING CUE:

The SM/CRS directs you to initiate emergency boration using BAMT Gravity Feed to Charging pump suction beginning with OP 2203.032, Emergency Boration, Step 2.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- Mode 3
- A Shutdown Margin is calculated following a reactor trip
- Shutdown Margin is found to be less than required

INITIATING CUE:

The SM/CRS directs you to initiate emergency boration using BAMT Gravity Feed to Charging pump suction beginning with OP 2203.032, Emergency Boration, Step 2.

INSTRUCTIONS	CONTINGENCY ACTIONS

NOTE

Steps marked with (*) are continuous action steps.

1. Refer to 1903.010, Emergency Action Level Classification.

2. Verify at least ONE Charging pump running with flow greater than or equal to 40 gpm.

   2. Perform the following:

      A. IF in Mode 1 or 2, THEN perform the following:

         1) Trip Reactor.

         2) GO TO 2202.001, Standard Post Trip Actions.

      B. IF in Mode 3, 4, 5, or 6, THEN perform the following:

         1) Verify TCBs open.

         2) GO TO Step 8.

INSTRUCTIONS	CONTINGENCY ACTIONS
3. Align Charging pump suction to at least ONE of the following sources: A. Gravity Feed: 1) Open at least ONE BAM Tank Gravity Feed valve: • 2CV-4920-1 • 2CV-4921-1 B. Boric Acid Makeup: 1) Start at least ONE BAM pump. 2) Open Emergency Borate From BAM Pumps valve (2CV-4916-2). 3) Verify Boric Acid Makeup Flow Control valve (2CV-4926) closed. C. RWT to Charging pumps: 1) Open Charging Pump Suction Source From RWT valve (2CV-4950-2).	
4. Close VCT Outlet valve (2CV-4873-1).	4. IF VCT Outlet valve does NOT close, THEN perform the following: A. Start at least ONE BAM pump. B. Open Emergency Borate From BAM Pumps valve (2CV-4916-2). C. Verify Boric Acid Makeup Flow Control valve (2CV-4926) closed.
5. Check Reactor Makeup Water Flow Control valve (2CV-4927) closed.	5. IF 2CV-4927 NOT closed, THEN close VCT Make Up Isolation valve (2CV-4941-2).

INSTRUCTIONS	CONTINGENCY ACTIONS
6. Check Charging Header Flow indicator (2FIS-4863) greater than or equal to 40 gpm.	6. GO TO Step 2.
7. GO TO Step 15.	
8. Check RCS pressure less than 1265 psia.	8. Reduce RCS pressure as follows: A. Reset Low PZR Press Setpoints during pressure reduction. B. Commence RCS pressure reduction to less than 1265 psia as follows: 1) IF RCPs running, THEN use Normal PZR spray. 2) IF ALL RCPs stopped, THEN open PZR High Point Vent To Quench Tank valves: • 2SV-4636-1 • 2SV-4636-2 • 2SV-4669-1 C. Place ALL PZR Heaters in OFF. D. Maintain RCS MTS greater than 30°F.
9. Align ONE HPSI Train as follows: A. Verify RWT level greater than 7.5%. B. Verify associated RWT Outlet valve open: • 2CV-5630-1 • 2CV-5631-2 C. Start HPSI pump on recirc, refer to 2104.039, HPSI System Operation.	

INSTRUCTIONS	CONTINGENCY ACTIONS

10. Check SDC secured.

10. Control RCS inventory as follows:

A. IF desired,
THEN control RCS inventory with SDC pump Mini Recirc valves as follows:

1) Open running SDC pump Mini Recirc to RWT valve:

PUMP	RECIRC VALVE
2P60A	2CV-5123-1
2P60B	2CV-5124-1
2P35A	2CV-5673-1
2P35B	2CV-5672-1

2) GO TO Step 13.

B. At SM discretion, place Letdown in service as follows:

1) Place Letdown in service using Attachment A, Placing Letdown In Service.

2) Place VCT Bypass To BMS selector switch (2CV-4826) to BMS.

3) Locally place "VACUUM DEGASIFIER INLET" valve (2CV-2211) to HOLD UP TANK.

4) Place Degas selector switch (2HS-2221) to HOLD UP TANK.

5) GO TO Step 13.

(Step 10 continued on next page)

INSTRUCTIONS	CONTINGENCY ACTIONS
10. (continued)	C. IF desired, THEN verify SDC purification in service using 2104.004, Shutdown Cooling System as follows: 1) Place VCT Bypass To BMS selector switch (2CV-4826) to BMS. 2) Locally place "VACUUM DEGASIFIER INLET" valve (2CV-2211) to HOLD UP TANK. 3) Place Degas selector switch (2HS-2221) to HOLD UP TANK. 4) Throttle Letdown Pressure controller (2PIC-4812) to maintain RCS inventory. 5) GO TO Step 13. **CAUTION** Temperature limit downstream of Letdown HX is 150°F.
* 11. Check RCS temperature greater than 450°F.	* 11. IF RCS temperature less than 450°F AND at SM discretion, THEN place Letdown in service as follows: A. Place Letdown in service using Attachment A, Placing Letdown In Service. B. WHEN Letdown in service, THEN GO TO Step 13.

INSTRUCTIONS | **CONTINGENCY ACTIONS**

NOTE
RCS Tech Spec cooldown rate limit is 100°F/HR (constant) , NOT to exceed 50°F in any 1/2 hour period (step),
(TS 3.4.9.1 adjusted for instrument uncertainty)

INSTRUCTIONS	CONTINGENCY ACTIONS
* 12. Commence RCS cooldown as necessary to allow a makeup rate greater than or equal to 40 gpm as follows:	
A. Verify a maximum of ONE RCP running in EACH loop.	
B. <u>IF</u> RCP 2P32A or 2P32B stopped, <u>THEN</u> verify associated PZR Spray valve in MANUAL and closed: • 2CV-4651 • 2CV-4652	
C. Reset Low PZR Pressure and Low SG pressure setpoints during cooldown and depressurization.	
D. Check IA pressure greater than 65 psig.	D. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> perform the following: 1) Use SDBCS Upstream ADVs or Upstream ADV Isolation MOVs. 2) GO TO Step 12.K.

(Step 12 continued on next page)

INSTRUCTIONS	CONTINGENCY ACTIONS
12. (continued)	
E. Check MSIS reset.	E. IF time permits, THEN reset MSIS using 2202.010, Attachment 14, MSIS Reset.
F. Check MSIVs open.	F. Perform the following:

F. Perform the following:

1) IF MSIS reset,
THEN perform following:

a) Open MSIV Bypass valves:

- 2CV-1040-1
- 2CV-1090-2

b) WHEN SG and Main Steam pressure equalize within 50 psi, THEN open MSIVs:

MSIV A	MSIV B
2SV-1010-1A	2SV-1060-1A
2SV-1010-2A	2SV-1060-2A
2SV-1011	2SV-1066

2) IF MSIVs can NOT be opened,
THEN perform the following:

a) Use SDBCS Upstream ADVs or Upstream ADV Isolation MOVs.

b) GO TO Step 12.K.

(Step 12 continued on next page)

INSTRUCTIONS	CONTINGENCY ACTIONS
12. (continued)	
G. Check "SDBCS CONDENSER INTERLOCK" annunciator (2K02-B14) clear.	G. Perform the following: 1) Control RCS cooldown rate with SDBCS ADVs or Upstream ADV Isolation MOVs. 2) GO TO Step 12.K.
H. Control RCS cooldown rate with SDBCS Bypass valves.	
I. Check at least ONE Condensate pump running.	I. IF power available, THEN start ONE Condensate pump using 2106.016, Condensate and Feedwater Operations.
J. Check SU/BD DI to EFW Pump Suction valve (2EFW-0706) open.	J. IF EFW or AFW pump running AND SU/BD DI in service, THEN locally unlock and open "SU/BD DI TO EFWP SUCT" valve (2EFW-0706).
K. Monitor RCS cooldown rate as follows: 1) Plot RCS pressure verses temperature using 2202.010 Attachment 1, P-T Limits, 2) Record RCS T_C and PZR temperature using 2202.010 Attachment 8, RCS Cooldown Table every 15 minutes.	

INSTRUCTIONS	CONTINGENCY ACTIONS
13. Establish HPSI flow as follows:	
A. Check Train A being used AND throttle ONE HPSI Injection MOV to maintain PZR level: • 2CV-5015-1 • 2CV-5035-1 • 2CV-5055-1 • 2CV-5075-1	A. Throttle ONE HPSI Train B Injection MOV to maintain PZR level: • 2CV-5016-2 • 2CV-5036-2 • 2CV-5056-2 • 2CV-5076-2
B. Maintain HPSI flow to RCS greater than or equal to 40 gpm as indicated on SPDS.	
* 14. Maintain RCS pressure less than 1265 psia as follows:	
A. Check RCPs running AND control RCS pressure with the following: • Normal Spray using 2202.010 Attachment 48, RCS Pressure Control. • Cooldown rate • Throttling HPSI • Letdown	A. Control RCS pressure with the following: 1) Letdown 2) Cooldown rate 3) Throttling HPSI

INSTRUCTIONS	CONTINGENCY ACTIONS
* 15. Check Emergency Boration termination criteria met: • CEAs above Transient Insertion Limit. OR • Shutdown Margin established using 2202.010, Attachment 28, Boric Acid Required for Shutdown Margin. OR • Boron concentration greater than 2500 ppm in Mode 6.	* 15. Perform the following: A. Continue Emergency Boration. B. WHEN Emergency Boration complete, THEN GO TO Step 16. C. Do NOT continue.
16. Check Charging used for Emergency Boration.	16. GO TO Step 18.
17. Realign Charging pump suction as follows: A. Open VCT Outlet valve (2CV-4873-1). B. Close Charging Pump Suction From RWT valve (2CV-4950-2). C. Close BAM Tank Gravity Feed valves: • 2CV-4920-1 • 2CV-4921-1 D. Stop BAM pumps. E. Close Emergency Borate From BAM Pumps valve (2CV-4916-2). F. GO TO Step 19.	

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 018 **DATE:** ____________

SYSTEM/DUTY AREA: Emergency Feedwater System

TASK: Shutdown EFW Train ‘A’ with EFAS Signal Present

JTA#: ANO2-RO-EFW-NORM-20

Alternate Path Yes: ____ No: X **Time Critical** Yes: ____ No: X

KA VALUE RO: 3.9 SRO: 4.2 **KA REFERENCE:** 061 A1.01

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 **LAB:** ____

POSITION EVALUATED: RO: ____ SRO: ____

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

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): OP 2106.006, Emergency Feedwater 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** ____

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Mode 3
- Post Reactor trip
- EFAS #1 and #2 have actuated
- Chemistry notified to sample Main Steam to accommodate dose calculations

TASK STANDARD:

- Overrode 2P-7B EFW pump Flow Control valves and established sufficient flow that raised both Steam Generator levels.
- Reset both trains EFAS actuation then secured 2P-7A EFW pump.
- Ensured 2P-7A EFW pump Discharge valves were aligned for the Mode 3 plant configuration.

TASK PERFORMANCE AIDS:

OP 2106.006, Emergency Feedwater Operations, Section 13.0

SIMULATOR INITIAL CONDITIONS:

Mode 3 after RX trip, EFAS 1 & EFAS 2 actuated.

Ensure generator levels are cycling based on SG level setpoints.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs you to perform OP 2106.006, Emergency Feedwater System Operations, Section 13, Reset EFAS and Establishing Feed with 2P-7B, beginning with step 13.2.

START TIME: _______________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1. (Step 13.2)	Verify EFW pump 2P-7B (2HS-0710A-1) running.	On panel 2C17, verified 2P7B running. Observed green light OFF; red light ON above handswitch. Observed 2P7B discharge pressure > 950 psig on EFW-B Disch (2PIS-0710-1).	N/A SAT UNSAT
Examiner note: The applicant may elect to override one set of valves to a SG and establish enough flow to get level rising then override the set of valves that feed the other SG and establish enough flow to get level rising. **Examiner note: If the applicant does not establish enough flow SG, level will lower causing EFAS to re-actuate and the applicant will have to start over and override the EFW valves again.**				
(C)	2. (Step 13.3)	Reset 2P-7B flow control valve relays by placing handswitches to EFAS OVERRIDE: • 2HS-1025B-1 • 2HS-1075B-1	On panel 2C17, rotated handswitches 2HS-1025B-1 and 2HS-1075B-1 to the "EFAS OVERRIDE" position.	N/A SAT UNSAT
(C)	3. (Step 13.4)	Override 2P-7B Discharge valves by placing handswitches to OPEN: • 2CV-1038-2 (2HS-1038-2) • 2CV-1036-2 (2HS-1036-2)	On panel 2C17, placed handswitches for 2CV-1036-2 and 2CV-1038-2 to OPEN and released. Observed green light OFF; red light ON over handswitches for 2CV-1036-2 and 2CV-1038-2	N/A SAT UNSAT
EXAMINER'S NOTE: Flow rate is discretionary and a function of RCS temperature and pressure.				

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	4. (Step 13.5)	Throttle open the following valves to restore S/G levels to approximately 60%: • For A S/G, 2CV-1025-1 (2HS-1025A-1) • For B S/G, 2CV-1075-1 (2HS-1075A-1)	On panel 2C17, adjusted handswitches for 2CV-1025-1 and 2CV-1075-1 to raise S/G levels. Observed green lights ON; red lights ON and movement on the "Percent Open" meters over handswitches.	N/A SAT UNSAT
	5. (Step 13.6)	Monitor RCS temperature and pressure during S/G refill.	Used SPDS, Plant Computer, or control boards indications to monitor RCS temperature and PZR pressure.	N/A SAT UNSAT
	6. (Step 13.7)	Verify feed flow indicated to BOTH S/Gs: • For A S/G, (2FIS-0710-1) • For B S/G, (2FIS-0717-1)	On panel 2C17, verified flow appropriate to restore SG levels. Observed flow on EFW flow indicators 2FIS-0710-1 and 2FIS-0717-1.	N/A SAT UNSAT
EXAMINER'S NOTE: The simulator only has 2C40 hardware. The reset will be accomplished in 2C40 only.				
(C)	7. (Step 13.8)	WHEN S/G levels above EFAS reset setpoint, THEN depress "EFAS Lockout Relays Reset" pushbuttons: • In 2C39 • In 2C40 **Examiner Cue:** **If asked inform applicant that 2C39 indicates the same as 2C40.**	On panel 2C40-7 when S/G levels are above EFAS setpoint (~ 23 %) depressed reset pushbuttons for EFAS-1and EFAS-2. Observed Red light ON above the EFAS-1 pushbutton and above the EFAS-2 pushbutton.	N/A SAT UNSAT
(C)	8. (Step 13.9)	Stop 2P-7A by placing Steam Supply (2HS-0340-2) to CLOSE.	Placed 2HS-0340-2 to CLOSE. Observed green light ON, red light OFF above handswitch for 2CV-0340-2 and 2P-7A slowing down.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	9. (Step 13.10)	Record time Steam Supply 2CV-0340-2 closed in Station log. **Examiner Cue:** **Inform applicant another operator has recorded the closed time in the station log.**	Requested that the CRS or another operator record time 2CV-0340-2 closed in Station Log.	N/A SAT UNSAT
	10. (Step 13.11)	Verify 2P-7A Discharge valves OPEN: • 2CV-1037-1 (2HS-1037-1) • 2CV-1039-1 (2HS-1039-1)	On panel 2C16, placed the handswitches for 2CV-1037-1 and 2CV-1039-1 to OPEN. AND/OR On panel 2C16, observed red light ON and green light OFF above handswitches for 2CV-1037-1 and 2CV-1039-1.	N/A SAT UNSAT
	11. (Step 13.12) (Step 13.12.1)	Perform the following to ensure positive seating of 2P-7A Discharge Stop Checks to S/Gs 2EFW-7A and 2EFW-8A: Verify 2P-7A Discharge valves OPEN: • 2CV-1026-2 (2HS-1026-2) • 2CV-1076-2 (2HS-1076-2)	On panel 2C16, placed the handswitches for 2CV-1026-2 and 2CV-1076-2 to OPEN. AND/OR On panel 2C16, observed red light ON and green light OFF above handswitches for 2CV-1026-2 and 2CV-1076-2.	N/A SAT UNSAT
(C)	12. (Step 13.12.2)	CLOSE 2CV-1026-2 (2HS-1026-2).	On panel 2C16, placed the handswitch for 2CV-1026-2 to CLOSE. **AND** On panel 2C16, observed red light OFF and green light ON above handswitch for 2CV-1026-2.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	13. (Step 13.12.3)	CLOSE 2CV-1076-2 (2HS-1076-2).	On panel 2C16, placed the handswitch for 2CV-1076-2 to CLOSE. **AND** On panel 2C16, observed red light OFF and green light ON above handswitch for 2CV-1076-2.	N/A SAT UNSAT
END				

STOP TIME: _______________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- Mode 3
- Post Reactor trip
- EFAS #1 and #2 have actuated
- Chemistry notified to sample Main Steam to accommodate dose calculations

INITIATING CUE:

The CRS directs you to perform OP 2106.006, Emergency Feedwater System Operations, Section 13, Reset EFAS and Establishing Feed with 2P-7B, beginning with step 13.2.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- Mode 3
- Post Reactor trip
- EFAS #1 and #2 have actuated
- Chemistry notified to sample Main Steam to accommodate dose calculations

INITIATING CUE:

The CRS directs you to perform OP 2106.006, Emergency Feedwater System Operations, Section 13, Reset EFAS and Establishing Feed with 2P-7B, beginning with step 13.2.

13.0 RESETTING EFAS AND ESTABLISHING FEED WITH 2P-7B

13.1 Notify Chemistry to perform the following:

- Take required EFW samples. (CR-ANO-2-1999-0324)
- Sample Main Steam as needed to accommodate effluent release calculations. (CR-ANO-2-1999-0324)

13.2 Verify EFW pump 2P-7B (2HS-0710A-1) running.

13.3 Reset 2P-7B flow control valve relays by placing handswitches to EFAS OVERRIDE:

- 2HS-1025B-1
- 2HS-1075B-1

13.4 Override 2P-7B Discharge valves by placing handswitches to OPEN:

- 2CV-1038-2 (2HS-1038-2)
- 2CV-1036-2 (2HS-1036-2)

* 13.5 Throttle open the following valves to restore S/G levels to approximately 60%:

- For A S/G, 2CV-1025-1 (2HS-1025A-1)
- For B S/G, 2CV-1075-1 (2HS-1075A-1)

* 13.6 Monitor RCS temperature and pressure during S/G fill.

* 13.7 Verify feed flow indicated to BOTH S/Gs:

- For A S/G, (2FIS-0710-1)
- For B S/G, (2FIS-0717-1)

13.8 <u>WHEN</u> S/G levels above EFAS reset setpoint,
<u>THEN</u> depress "EFAS Lockout Relays Reset" pushbuttons:

- In 2C39
- In 2C40

13.9 Stop 2P-7A by placing Steam Supply (2HS-0340-2) to CLOSE.

13.10 Record time Steam Supply 2CV-0340-2 closed in Station log.

13.11 Verify 2P-7A Discharge valves OPEN:

- 2CV-1037-1 (2HS-1037-1)
- 2CV-1039-1 (2HS-1039-1)

13.12 Perform the following to ensure positive seating of 2P-7A Discharge Stop Checks to S/Gs 2EFW-7A and 2EFW-8A:

13.12.1 Verify 2P-7A Discharge valves OPEN:

- 2CV-1026-2 (2HS-1026-2)
- 2CV-1076-2 (2HS-1076-2)

13.12.2 CLOSE 2CV-1026-2 (2HS-1026-2).

13.12.3 CLOSE 2CV-1076-2 (2HS-1076-2).

13.13 Notify Chemistry of the following:

- Steam Supply (2CV-0340-2) open and closed times.
- Request initiation of P-7A and 2P-7A Sample Report IAW Analysis of Unit Vents (1604.015).

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 002 **DATE:** ______

SYSTEM/DUTY AREA: PZR spray operation

TASK: Initiate Auxiliary Spray

JTA#: ANO2-RO-PZR-NORM-7

Alternate Path Yes: X No: ______ **Time Critical** Yes: ______ No: X

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: 15 Minutes

REFERENCE(S): 2202.010 Standard Attachments, Attachment 48 RCS pressure control

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** ______

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- Mode 3
- Post Reactor Trip
- No RCPs running
- Letdown Isolated due a control valve issue.
- The Steam Dump Bypass Control System has failed
- RCS Pressure >2250psia and slowly rising.

TASK STANDARD:

Determined Auxiliary Spray valve failed, and aligned RCS High point vents to lower RCS pressure.

Lowered RCS pressure, PZR code safety did not lift (~2500 psia), and secured vent lineup.

TASK PERFORMANCE AIDS:

2202.010, Standard Attachment 48, RCS pressure control.

SIMULATOR SETUP:

Mode 3, All RCPs secured Pzr Pressure rising.

Steam dump emergency off actuated.

On Trigger 2 CV48242 value = 0, DO_HS_4824_G = off, and DO_HS_4824_R = off

T2 set to HG4R8242

EXAMINER'S NOTES:

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs you to establish Auxiliary Spray flow to control Pressurizer pressure to 2150 to 2250 psia using 2202.010 Standard Attachment 48 starting Step 1.D.

START Time: ____________________

		PERFORMANCE CHECKLIST	STANDARDS	(Circle One)
EXAMINER NOTE: Maintain the simulator in Freeze until the applicant is ready to start.				
	1. (Step 1.D.1)	IF desired to use AUXILIARY Spray, THEN perform the following: * 1) Verify RCS MTS greater than 30 degrees.	On SPDS determined that CET MTS was greater than 30 degrees.	N/A SAT UNSAT
	2. (Step 1.D.2)	Verify at least ONE Charging Pump running	On Panel 2C09, verified at least one Charging Pump (2P36A, B, C) running by observing red light ON above appropriate handswitch: 2HS-4832-1 2P36A 2HS-4852-1 2P36C 2HS-4853-2 2P36C 2HS-4842-2 2P36B	N/A SAT UNSAT
	3 (Step 1.D.3)	Close Regen HX to RCP B/C valves: • 2CV-4827-2 • 2CV-4831-2	On panel 2C09, placed handswitch for 2CV-4827-2 and 2CV-4831-2 in CLOSE. Observed Green light ON; Red light OFF above handswitches for 2CV-4827-2 and 2CV-4831-2.	N/A SAT UNSAT
Procedure Note: PZR Spray Block valves 2CV-4653 and 2CV-4655 are de-energized due to degraded power supply cables.				
	4. (Step 1.D.4)	Verify PZR Spray (2CV-4651/2CV-4652) or PZR Spray Isolation valves (2HS-4655/2HS-4653) closed.	On Panel 2C09, observed Green light ON, Red light OFF for following valves: 2CV-4651 AND 2CV-4652 OR 2CV-4655 AND 2CV-4653.	N/A SAT UNSAT
Examiner Note: the following step will start the alternate path portion of this JPM.				

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	5. (Step 1.D.5)	Throttle Aux Spray valve (2CV-4824-2) as necessary. **Examiner Cue: If applicant informs CRS of 2CV-4824-2 failure direct them to control RCS pressure 2150 to 2250 psia.**	On Panel 2C09, placed handswitch for Aux Spray Valve (2CV-4824-2) to OPEN. Observed Red light OFF, Green light OFF due to breaker trip. **Critical Portion:** Monitored RCS pressure and determined pressure is not lowering.	N/A SAT UNSAT
Examiner Note: The applicant should transition to step 3 of attachment 48.				
(C)	6. (Step 3)	IF unable to control RCS pressure using heater and spray methods, THEN utilize EITHER of the following for RCS pressure control: • Secondary heat removal using 2105.008 Exhibit 3, SDBCS Emergency Operation. • Cycle High Point Vent Valves as needed, refer to 2202.010 Attachment 1, P-T Limits: • 2SV-4636-1 • 2SV-4636-2 • 2SV-4668-1 • 2SV-4668-2 • 2SV-4669-1 • 2SV-4670-2	Determined that SDBCS valves are not available from initial conditions AND On panel 2C336-1 or 2C336-2, At a minimum, opened 2 high point vent valves to lower RCS pressure in one of the following combinations: (more than two valves are allowed if pressure reduction is not sufficient.) Either PZR high point vent 2SV-4636-1 or 2SV-4636-2 OR Either Reactor vessel head vent 2SV-4668-1 or 2SV-4668-2. AND Either Quench tank 2SV-4669-1 or CNTMT vent 2SV-4670-2. **It is critical that the selected valves are opened prior to lifting the PZR code safety (~2500 psia)**	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	7. (Step 3)	• Cycle High Point Vent Valves as needed, refer to 2202.010 Attachment 1, P-T Limits: • 2SV-4636-1 • 2SV-4636-2 • 2SV-4668-1 • 2SV-4668-2 • 2SV-4669-1 • 2SV-4670-2 **Examiner Cue: When satisfied with applicant performance (lowering pressure) then inform the applicant to secure line up.**	On panel 2C336-1 or 2C336-2, Closed the appropriate valves to stop RCS pressure reduction.	N/A SAT UNSAT
END				

STOP Time: ____________________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- Mode 3
- Post Reactor Trip
- No RCPs running
- Letdown Isolated due a control valve issue.
- The Steam Dump Bypass Control System has failed and will not function.
- RCS Pressure >2250psia and slowly rising.

INITIATING CUE:

The CRS directs you to establish Auxiliary Spray flow to control Pressurizer pressure to 2150 to 2250 psia using 2202.010 Standard Attachment 48 starting Step 1.D.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- Mode 3
- Post Reactor Trip
- No RCPs running
- Letdown Isolated due a control valve issue.
- The Steam Dump Bypass Control System has failed and will not function.
- RCS Pressure >2250psia and slowly rising.

INITIATING CUE:

The CRS directs you to establish Auxiliary Spray flow to control Pressurizer pressure to 2150 to 2250 psia using 2202.010 Standard Attachment 48 starting Step 1.D.

NOTE
Once method of pressure control is established, this attachment is not required in hand or continuous use. A change to the method of pressure control will require in hand or continuous use until the new pressure control method is established.

* 1. Maintain RCS pressure with heaters and spray using one or more of the following:

A. IF desired to use PZR Pressure controller (2PIC-4626A/B),
THEN perform the following:

* 1) Verify RCS MTS greater than 30 degrees.

2) Adjust PZR Pressure controller (2PIC-4626A/B)setpoint to desired pressure.

B. IF desired to use PZR Heaters,
THEN perform the following:

1) Cycle available PZR Backup heaters as necessary.

2) Cycle available PZR Proportional heaters as necessary.

N/A ~~C.~~ IF desired to use NORMAL Spray,
THEN perform the following:

* 1) Verify RCS MTS greater than 30 degrees.

2) IF PZR Spray Valve (2CV-4651) to be used,
THEN perform the following:

a) Verify RCP 2P32A running.

b) Place 2HS-4651B in MANUAL.

c) Cycle PZR Spray Valve (2CV-4651) using 2HS-4651A.

3) IF PZR Spray Valve (2CV-4652) to be used,
THEN perform the following:

a) Verify RCP 2P32B running.

b) Place 2HS-4652B in MANUAL.

c) Cycle PZR Spray Valve (2CV-4652) using 2HS-4652A.

4) IF RCS margin to saturation greater than 160°F,
THEN complete Table 1 of this attachment.

(Step 1 continued on next page)

(Step 1 continued)

D. IF desired to use AUXILIARY Spray,
THEN perform the following:

* 1) Verify RCS MTS greater than 30 degrees.

2) Verify at least ONE Charging pump running.

3) Close Regen HX to RCP B/C valves:

- 2CV-4827-2
- 2CV-4831-2

NOTE
PZR Spray Block valves 2CV-4653 and 2CV-4655 are de-energized due to degraded power supply cables.

4) Verify PZR Spray (2CV-4651/2CV-4652) or PZR Spray Isolation valves (2HS-4655/2HS-4653) closed.

5) Throttle Aux Spray valve (2CV-4824-2) as necessary.

6) IF Regen HX to RCS temperature (2TI-4825) can NOT be reduced to less than 275°F,
THEN perform ONE of the following:

a) Isolate Letdown to reduce temperature.

b) Complete Table 1 of this attachment.

7) IF Regen HX to RCS (2TI-4825) AND PZR water phase (2TI-4627) differential temperature greater than 200°F AND PMS is unavailable,
THEN complete Table 1 of this attachment.

2. IF HPSI in service AND HPSI maintaining elevated RCS pressure,
THEN recommend HPSI termination using 2202.010 Exhibit 10, HPSI Termination/Throttling Criteria.

3. IF unable to control RCS pressure using heater and spray methods, THEN utilize EITHER of the following for RCS pressure control:

- Secondary heat removal using 2105.008 Exhibit 3, SDBCS Emergency Operation.
- Cycle High Point Vent Valves as needed, refer to 2202.010 Attachment 1, P-T Limits:
  - 2SV-4636-1
  - 2SV-4636-2
  - 2SV-4668-1
  - 2SV-4668-2
  - 2SV-4669-1
  - 2SV-4670-2

TABLE 1

TIME		TEMPERATURE		
SPRAY VALVE OPENED	SPRAY VALVE CLOSED	(PZR WATER PHASE) 2TI-4627	2TIS-4607 2TIS-4608 2TI-4825	DIFFERENCE

4. IF Table 1 filled out, THEN forward completed form to Unit 2 Systems Engineering.

Completed by ______________________________ Date _______________ .

Reviewed by ______________________________ Date _______________.

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 001 **DATE:** ______

SYSTEM/DUTY AREA: Fire System

TASK: Respond to a Fire Panel alarm.

JTA#: ANO2-RO-FPS-OFFNORM-23

Alternate Path Yes: ____ No: X **Time Critical** Yes: ____ No: X

KA VALUE RO: 3.5 SRO: 3.5 **KA REFERENCE:** 086 A4.02

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: 10 Minutes

REFERENCE(S): OP-2203.009 Fire Protection system annunciator corrective active.

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** ____

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

2K-11 A9 Fire Alarm has annunciated.

TASK STANDARD:

Fire panel aligned for re-flash and 2VSF-7A/B, 2VEF-8A/B, and 2VEF-24C/D are secured.

TASK PERFORMANCE AIDS:

OP 2203.009 Fire Protection System ACA.

SIMULATOR SETUP:

FIRAL124T set for trigger 1.
Remove Auto acknowledge and take the simulator out of freeze prior to triggering 1.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs, "Respond to the Fire panel alarm IAW 2203.009 section 6."

START TIME:________________

	PERFORMANCE CHECKLIST		STANDARDS	(Circle One)
Examiner Note: Give the Yellow pages to the applicant.				
	1. (Step 6.1 and 6.1.1)	IF Fire Alarm received, THEN perform the following: Determine which module is in alarm on 2C343-1, 2, or 3.	On panel 2C343, observed that module 1-2-4 top is in alarm for North D/G room. Observed red light ON, on 2C343 1-2-4 top.	N/A SAT UNSAT
(C)	2. (Step 6.1.2)	Depress “Alarm Silence” switch on 2C343 to enable re-flash capability to Fire Alarm on 2K11.	On panel 2C343, depressed the “Alarm Silence” switch. **Not Critical:** Observed the panel alarm light flashing and recognized the alarm silence and alarm relay clicking.	N/A SAT UNSAT
	3. (Step 6.1.3)	Refer to appropriate page in Attachment A of this procedure for alarming zone.	Using Attachment A determined that they should use the section for red fire alarm page 36 of the procedure.	N/A SAT UNSAT
Examiner Note: The following are the steps from page 36 (steps for 1-2-4T) No. 2 EDG Room Red flame detector.				
	4. (Step 2.1)	Silence alarm in accordance with Section 6.0 of this procedure.	On panel 2C343, verified alarm silenced. Examiner note: The alarm has already been silenced using section 6.	N/A SAT UNSAT
	5. (Step 2.2)	Dispatch Operator to No. 2 EDG (2K4B) Room to check for fire. **Examiner Cue:** **State that the NLO will respond to the alarm.** **Then state that there is an active fire in No. 2 EDG room”**	Call Non-licensed operator on the radio or phone to respond to the alarm.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	6. (Step 2.3 and 2.3.1)	IF fire confirmed, THEN perform the following: Initiate Fire or Explosion (2203.034) in conjunction with this procedure. **Examiner Cue:** **State that the CRS will implement Fire or Explosion AOP.**	Initiated action to have Fire or Explosion AOP implemented.	N/A SAT UNSAT
	7. (Step 2.3.2)	Refer to Fire Plan. **Examiner Cue:** **State that the CRS will refer to the fire plan for 2094-Q.**	Initiated action to have the fire plan reviewed for room 2094-Q.	N/A SAT UNSAT
(C)	8. (Step 2.3.3)	Secure Radwaste Supply fans (handswitch to OFF): • 2HS-8401 (2VSF-7A) • 2HS-8402 (2VSF-7B)	On panel 2C22. • Placed handswitch 2HS-8401 for 2VSF-7A to off. • Placed handswitch 2HS-8402 for 2VSF-7B to off. **Not Critical:** Observed Green light on, Red light off for previously listed fans.	N/A SAT UNSAT
Examiner Note: When the fan is placed in PTL it will cause 2K13-A8 which is a loud alarm.				
(C)	9. (Step 2.3.4)	Verify idle Radwaste Exhaust fan in PULL TO LOCK: • 2HS-8407 (2VEF-8A) • 2HS-8408 (2VEF-8B)	On panel 2C22. • Placed handswitch 2HS-8407 for 2VEF-8A to Pull to Lock. **Not Critical:** Observed Green light on, Red light off for 2VEF-8A.	N/A SAT UNSAT
(C)	10. (Step 2.3.5)	Place running Radwaste Exhaust fan in PULL TO LOCK: • 2HS-8407 (2VEF-8A) • 2HS-8408 (2VEF-8B)	On panel 2C22. • Placed handswitch 2HS-8408 for 2VEF-8B to Pull to Lock. **Not Critical:** Observed Green light on, Red light off for 2VEF-8B.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			**STANDARDS**	(Circle One)
	11. (Step 2.3.6)	Locally secure #2 EDG Room Exhaust fans: A. Perform the following to secure 2VEF-24C at 2B62-C6: 1. Verify Local/Remote HS (2HS-8638-2S) in LOCAL. 2. Verify Local Control HS (2HS-8638-2A) in OFF. B. Perform the following to secure 2VEF-24D at 2B62-C7: 1. Verify Local/Remote HS (2HS-8640-2S) in LOCAL. 2. Verify Local Control HS (2HS-8640-2A) in OFF. **Examiner Cue:** **When requested state the NLO will place the local remote HS in local and the local control HS in off for 2VEF-24C on 2B-62-C6.** **When requested state the NLO will place the local remote HS in local and the local control HS in off for 2VEF-24D on 2B-62C7.**	Call Non-licensed operator on the radio or phone to locally secure the #2 EDG room fans.	N/A SAT UNSAT
Examiner note: When the applicant has secured the ventilation fans the JPM is complete.				
END				

STOP TIME:________________

JOB PERFORMANCE MEASURE

EXAMINER's COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

2K-11 A9 Fire Alarm has annunciated.

INITIATING CUE:

The CRS directs, "Respond to the Fire panel alarm IAW 2203.009 using section 6."

JOB PERFORMANCE MEASURE

EXAMINEE's COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- 2K-11 A9 Fire Alarm has annunciated.

INITIATING CUE:

The CRS directs, "Respond to the Fire panel alarm IAW 2203.009 using section 6."

6.0 INSTRUCTIONS
{4.3.3}

**6.1 IF Fire Alarm received,
THEN perform the following:**

6.1.1 Determine which module is in alarm on 2C343-1, 2, or 3.

6.1.2 Depress "Alarm Silence" switch on 2C343 to enable reflash capability to Fire Alarm on 2K11.

6.1.3 Refer to appropriate page in Attachment A of this procedure for alarming zone.

**6.1.4 IF firewater flow is necessary
AND firewater is being used for any reason other than normal on EITHER unit (i.e., temporary cooling, etc.),
THEN isolate firewater to any "other than normal" component.**

6.2 IF a fire occurs in any of the following locations,
THEN refer to Alternate Shutdown (2203.014):

- Unit 2 Control Room
- Cable Spreading Room
- Upper South Electrical Penetration Room
- RP Office (CA2)
- Control Room Printer Room
- CPC Room (Old OR New)

6.3 IF Trouble Alarm received,
THEN perform the following:

6.3.1 Silence alarm using Trouble Silence switch on 2C343 Alarm Control Unit.

6.3.2 Refer to Alarm Control Unit (Yellow Master Trouble Light) section of this procedure.

6.4 IF 2C343 fails,
THEN implement Attachment B, Requirements for Loss of 2C343.

NOTE
Physical location of specific detectors can be determined from Fire Prints (FP-2100 series).

6.5 IF specific detector number is required information,
THEN refer to "Open List of Fire Detector ID's" database accessed from Fire Detection Database.

6.6 IF notified of a fire alarm or trouble alarm in the Generation Support Building (GSB),
THEN perform Exhibit 3, Generation Support Building Response.

ATTACHMENT A

2C343 ALARM INFORMATION

Detection areas annotated with * are TRM required. See Note *(1)and *(2) at end of table.

2C343-1				
2C343 LOCATION PNL-ROW-MOD	PAGE RED	PAGE YELLOW	ALARM AREA	PREFIRE PLAN NUMBER
1-1-1		24	Cable Spreading Room *	2098-L
1-1-2 (T)		19		
1-1-2 (B)		20		
1-1-4 (T)	25	23		
1-1-4 (B)	28	29		
1-1-5 (T)	30	23	Corridor to EDG Rooms *	2109-U
1-1-5 (B)	32	33		
1-1-7 (T)		20		
1-1-7 (B)		19		
1-1-8 (T)		34		
1-2-1 (T)		35	# 2 EDG Room (North) *	2094-Q
1-2-2 (T)		19		
1-2-2 (B)		20		
1-2-4 (T)	36	23		
1-2-4 (B)	39	23		
1-2-5 (T)	42	23	# 1 EDG Room (South) *	2093-P
1-2-5 (B)	45	23		
1-2-7 (T)		20		
1-2-7 (B)		19		
1-2-8 (T)		48		
1-3-4 (T)	49	23	North Containment Cable Spreading Areas *	2033-K
1-3-4 (B)	49	23		
1-3-5 (T)	52	23	North Electrical Penetration Areas *	UNEP 2183-J LNEP 2112-BB
1-3-5 (B)	52	23		
1-3-6 (T)		54		
1-3-7 (T)		19		
1-3-7 (B)		19		
1-3-8 (T)		55		
1-4-4 (T)	49	23	South Containment Cable Spreading Areas *	2032-K
1-4-4 (B)	49	23		
1-4-5 (T)	52	23	South Electrical Penetration Areas *	USEP 2137-I LSEP 2111-T
1-4-5 (B)	52	23		
1-4-6 (T)		52		
1-4-7 (T)		19		
1-4-7 (B)		19		
1-4-8 (T)		57		
1-5-1 (T)		58	Containment Preaction Valve	2032K 2033K
1-5-2 (T)		19		
1-5-2 (B)		20		
1-5-3 (T)	49	23	Containment Heat *	
1-5-5 (T)	59	23	Emergency Control Room chillers *	2136-I
1-5-5 (B)	61	62		
1-5-7 (T)		20		
1-5-7 (B)		20		
1-5-8 (T)		63		

ATTACHMENT A

Page 2 of 4

Detection areas annotated with * are TRM required. See Note *(1)and *(2) at end of table.

2C343-2				
2C343 LOCATION PNL-ROW-MOD	PAGE RED	YELLOW	ALARM AREA	PREFIRE PLAN NUMBER
2-1-1 (T)	21	23	CNTMT Purge Equipment Area ***(1)**	2156-A
2-1-1 (B)	21	23	EDG Air Intake *	2114-I
2-1-2 (T)	21	23	BAMT (2T6-A/B) Room ***(1)**	2115-I
2-1-2 (B)	21	23	Storage Room off 2VE-1A/B Hallway *	2136-I
2-1-3 (T)	21	23	RP Office Above False Ceiling *	2136-I
2-1-3 (B)	21	23	RP Office Below False Ceiling *	2136-I
2-1-4 (T)	21	23	RP Offices Cubicle Area (386) *	2136-I
2-1-4 (B)	21	23	Control Room *	2199-G
2-1-5 (T)	21	23	Control Room Supply Air Duct	2199-G
2-1-5 (B)	21	23	Control Room Return Air Duct	2199-G
2-1-6 (T)	21	23	Control Room Inside Panels *	2199-G
2-1-6 (B)	21	23	Control Room Printer Area ***(1)**	2119-H
2-1-7 (T)	21	23	2A4 Switchgear Room *	2100-Z
2-1-7 (B)	21	23	2A3 Switchgear Room *	2101-AA
2-1-8 (T)	21	23	Black Battery Room (West) ***(1)**	2103-V
2-1-8 (B)	21	23	Green Battery Room * (East Battery Room)	2102-Y
2-2-1 (T)	21	23	UNPP Room *	2081-HH
2-2-1 (B)	21	23	USPP Room *	2084-DD
2-2-2 (T)	21	23	MG Set Room * (North Electrical Equipment Room)	2076-HH
2-2-2 (B)	64	66	New CPC Room *	2098-C-G
2-2-4 (T)	21	21	Vacuum Degas Pump Room *	2106-R
2-2-4 (B)			Spare (CR-ANO-2-2007-00776)	
2-2-5 (T)	21	23	Corridor by Vac Degas/2B63 Room * (Access Corridor From Stair 2001)	2107-N
2-2-6 (T)	21	23	2Y25, 2B9/10 Room * (South Electrical Equipment Room)	2108-S
2-2-6 (B)	21	23	MCC 2B53 Room *	2091-BB
2-2-7 (T)	21	23	MCC 2B63 Room *	2096-M
2-2-7 (B)	21	23	SU & BD Demin Regen Room	2242-OO
2-2-8 (T)	21	23	2D02 Equipment Room *	2097-X
2-2-8 (B)	21	23	2Y11/13 Equipment Room * (West DC Equipment Room)	2099-W
2-3-1 (T)	21	23	SG Blowdown Tank *	2073-DD
2-3-1 (B)	21	23	VCT, 2P-43A/B ***(1)**	2072-R
2-3-2 (T)	21	23	Fuel Pool HX/USPP *	2084-DD
2-3-2 (B)	21	23	Hot Machine Shop *	2068-DD
2-3-3 (T)	21	23	2B62/Resin Add Area *	2073-DD
2-3-3 (B)	21	23	Waste Gas & Hot Lab Corridor (Aux Bldg. Access Corridor Area) *	2073-DD
2-3-4 (T)	21	23	Waste Gas Compressor Room *	2073-DD
2-3-4 (B)	21	23	2VEF-38A/B ***(1)**	2040-JJ
2-3-5 (T)	21	23	A EFW Pump Room ***(1)**	2024-JJ
2-3-5 (B)	21	23	B EFW Pump Room ***(1)**	2025-JJ
2-3-6 (T)	21	23	BMS Concentrator Room *	2040-JJ
2-3-6 (B)			Spare (CR-ANO-2-2007-00776)	

ATTACHMENT A

Detection areas annotated with * are TRM required. See Note *(1)and *(2) at end of table.

2C343-2				
2C343 LOCATION PNL-ROW-MOD	PAGE RED	YELLOW	ALARM AREA	PREFIRE PLAN NUMBER
2-3-7 (T)	21	23	2T-21A&B and Charging Pumps *	2040-JJ
2-3-7 (B)	21	23	SG BD Pumps *(1)	2040-JJ
2-3-8 (T)	21	23	SFP Cooling Pumps and 2F3/2F4*(1)	2040-JJ
2-3-8 (B)	21	23	WCO Desk Area *(1)	2040-JJ
2-4-1 (T)	21	23	B HPSI Pump Area * (East) (Pipeway, Equipment Access Area AB Extension)	2007-LL
2-4-1 (B)	21	23	C HPSI Pump Room*(1)	2010-LL
2-4-2 (T)	21	23	B HPSI Pump Area (West) * (East Pump Area and Gallery B ESF Room) (Pipeway, Equipment Access Area AB Extension)	2007-LL
2-4-2 (B)	21	23	Tendon Gallery *(1)	2011-LL
2-4-3 (T)	21	23	A HPSI Pump Room *(1)	2014-LL
2-4-3 (B)	21	23	B LPSI Pump Area * (Pipeway, Equipment Access Area AB Extension))	2007-LL
2-4-4 (T)	21	23	SG BD HX and Storeroom Area * (Pipeway, Equipment Access Area AB Extension)	2223-KK
2-4-4 (B)	21	23	SG BD HX and Storeroom Area * (Pipeway, Equipment Access Area AB Extension)	2223-KK
2-4-5 (T)	21	23	AB Extension 335' Access Area * (Pipeway, Equipment Access Area AB Extension)	2223-KK
2-4-5 (B)	21	23	Waste Concentrator/ 2T12 Valve Gallery *	2040-JJ
2-4-7 (T)	21	23	TB 354' Old Makeup Plant Area (Turbine Bldg. Demin Area Col*(2) 5.0-5.9 & A-C)	2200-MM
2-4-7 (B)	21	23	Waste Gas Tanks & 2F-15 Area *(1)	2040-JJ
2-4-8 (T)	21	23	LNPP Area *	2081-HH
2-4-8 (B)	21	23	LSPP Area *	2055-JJ
			EDG Fuel Oil Vault 2T-57A/B*(2)	Diesel Fuel Vault Unit 1, L
2-5-4 (T)	67	23		
2-5-4 (B)	69	23		
2-5-5 (T)	21	23	General Access Area 317' *	2006-LL
2-5-5 (B)	21	23	PASS Bldg	Unit 2 Vol 2B PASS Bldg

ATTACHMENT A

Detection areas annotated with * are TRM required. See Note *(1)and *(2) at end of table.

2C343-3				
2C343 LOCATION PNL-ROW-MOD	PAGE RED	PAGE YELLOW	ALARM AREA	PREFIRE PLAN NUMBER
CONTROL UNIT	6	17	Panel 2C343	N/A
3-2-1 (T)	21	23	Spent Fuel Pool Area ***(1)**	2151-A
3-2-3 (T)	21	23	Plant Computer Room 404 ***(1)**	2152-D
3-2-3 (B)	21	23	CEDM Equipment/2C80 Room * (Remote Shutdown Panels)	2154-E
3-2-4 (T)	21	23	Area Above Plant Computer Room***(1)**	2152-D
3-2-4 (B)	21	83	Plant Computer Cabinet & Below False Floor ***(1)**	2152-D
3-2-5 (T)	21	23	Room 2150 (Old CPC Room) *	2150-C
3-2-5 (B)	21	23	Behind TB Elevator Shaft	2200-MM
3-2-6 (T)	21	23	TB Fans 2VSF-14A, B, C	2200-MM
3-2-6 (B)	21	23	TB Fans 2VSF-14D, E, F	2200-MM
3-2-7 (T)	49	23	RCP 2P-32A Area *	2032-K
3-2-7 (B)	49	23	RCP 2P-32B Area *	2032-K
3-2-8 (T)	49	23	RCP 2P-32C Area *	2033-K
3-2-8 (B)	49	23	RCP 2P-32D Area *	2033-K
3-3-1 (B)	80	23	Intake Structure 2B43 * (366)	Intake Structure
3-3-3 (T)	91	23	2VEF-38A/B Charcoal Filter	2040-JJ
3-3-3 (B)	93	23	2VSF-9 Charcoal Filter	N/A
3-3-4 (T)	71	73	TG Bearings and LO Piping	2200-MM
3-3-4 (B)	75	23	Generator Exciter CO2	2200-MM
3-3-5 (T)		77	2HS-3217 Manual Actuation	2200-MM
3-3-6 (B)	85	87	Control Room Expansion Facility	2200-MM
3-3-8 (B)	88	90	AAC Diesel Generator Bldg	
3-4-1 (T)		79	Intake Structure *	Intake Structure
3-4-2 (T)		20		
3-4-2 (B)		19		
3-4-4 (T)	80	23		
3-4-4 (B)	80	23		

***(1) When LBDCR 15-017 is implemented in the TRM, these detector areas annotated with * are TRM required.**
***(2) When LBDCR 15-017 is implemented in the TRM, this detector area will not be TRM required.**

2C234				
2C234 LOCATION PNL-ROW-MOD	PAGE RED	PAGE YELLOW	ALARM AREA	PREFIRE PLAN NUMBER
234-1-1 (T)		20	TG Bearings and Lube Oil	2200-MM
234-1-1 (B)		78	TG Bearings and Lube Oil	2200-MM
234-1-2 (T)	71	73	Zone 1	N/A
234-1-2 (B)	71	73	Zone 2	N/A
234-1-3 (T)	71	73	Zone 3	N/A
234-1-3 (B)	71	73	Zone 4	N/A
234-1-4 (T)	71	73	Zone 5	N/A
234-1-4 (B)	71	73	Zone 6	N/A
234-2-1		78	TG Bearings and Lube Oil	N/A

l-2-4 (T)

No. 2 EDG Room (North)

RED Flame Detector Alarm

1.0 CAUSES

1.1 Flame detector actuation in No. 2 EDG Room.

2.0 ACTION REQUIRED

2.1 Silence alarm in accordance with Section 6.0 of this procedure.

2.2 Dispatch Operator to No. 2 EDG (2K4B) Room to check for fire.

2.3 IF fire confirmed,
THEN perform the following:

2.3.1 Initiate Fire or Explosion (2203.034) in conjunction with this procedure.

2.3.2 Refer to Fire Plan 2094-Q.

2.3.3 Secure Radwaste Supply fans (handswitch to OFF):

- 2HS-8401 (2VSF-7A)
- 2HS-8402 (2VSF-7B)

2.3.4 Verify idle Radwaste Exhaust fan in PULL TO LOCK:

- 2HS-8407 (2VEF-8A)
- 2HS-8408 (2VEF-8B)

2.3.5 Place running Radwaste Exhaust fan in PULL TO LOCK:

- 2HS-8407 (2VEF-8A)
- 2HS-8408 (2VEF-8B)

2.3.6 Locally secure #2 EDG Room Exhaust fans:

A. Perform the following to secure 2VEF-24C at 2B62-C6:

1. Verify Local/Remote HS (2HS-8638-2S) in LOCAL.
2. Verify Local Control HS (2HS-8638-2A) in OFF.

B. Perform the following to secure 2VEF-24D at 2B62-C7:

1. Verify Local/Remote HS (2HS-8640-2S) in LOCAL.
2. Verify Local Control HS (2HS-8640-2A) in OFF.

(No. 2 EDG Room (North) continued on next page)

l-2-4 (T)

RED Flame Detector Alarm (Continued)

2.3.7 IF notified by Fire Brigade Leader that fire is out AND desired to restore ventilation, THEN perform the following:

A. IF desired to restore #2 EDG Room Exhaust fan 2VEF-24C THEN perform the following:

1. Verify 2VEF-24C breaker (2B62-C6) closed.

2. Verify Local/Remote HS (2HS-8638-2S) at 2B62-C6 in REMOTE.

3. Verify 2VEF-24C HS (2HS-8638-2) on 2C33 in AUTO or START.

B. IF desired to restore #2 EDG Room Exhaust fan 2VEF-24D THEN perform the following:

1. Verify 2VEF-24D breaker (2B62-C7) closed.

2. Verify Local/Remote HS (2HS-8640-2S) at 2B62-C7 in REMOTE.

3. Verify 2VEF-24D HS (2HS-8640-2) on 2C33 in AUTO or START.

C. IF desired to restore Radwaste Area ventilation, THEN restore using Ventilation System Operations (2104.035).

2.4 IF requested by Fire Brigade Leader, THEN initiate Fire Water to fusible sprinkler heads by placing Manual Actuation switch (2HS-3230B, left) on module 1-2-2 in OPERATED position.

(No. 2 EDG Room (North) continued on next page)

l-2-4 (T)

RED Flame Detector Alarm (Continued)

3.0 TO CLEAR ALARM

3.1 Reset 2C343 and Fire Indicating Unit (2FIU-02) by momentarily depressing the following:

3.1.1 Fire Detection Reset button (2PB-24030) on 2C22.

3.1.2 Reset/Lamp Test switch on control unit module.

NOTE

- If inoperable detection system is in the same area as an inoperable fire barrier, then Technical Requirement 3.7.5 action requirement may change from an hourly fire patrol to a continuous patrol.
- FIU must reset to allow detector reset.

3.2 IF fire alarm will NOT reset,
THEN perform the following as necessary:

3.2.1 Declare affected fire detector inoperable.

3.2.2 Establish Fire Watch per ANO Fire Impairment Program (1000.120).

3.2.3 Report Fire System Impairment in accordance with Unit 2 Technical Requirements Manual.

3.2.4 Refer to Unit 2 Technical Requirements Manual, Technical Requirements 3.3.6 and 3.7.2.

3.2.5 Review Fire Detection Database to determine if additional firewatch controls required per Technical Requirement 3.7.5.

3.2.6 Initiate WR/WO as applicable.

3.2.7 DO NOT CONTINUE.

3.3 IF the master fire alarm will not reset,
THEN perform the following:

- Push red master reset button located in right side of 2C343-3 (labeled "RESET").
- Verify WR/WO initiated to repair Reset/Lamp Test switch.

3.4 IF Fire Water flow initiated or 2UAV-3230 tripped,
THEN secure Fire Water as follows:

3.4.1 Verify Manual Actuation switch (2HS-3230B, left) on module 1-2-2 in NORMAL position.

3.4.2 Reset 2UAV-3230 using Unit 2 Fire Protection System (2104.032).

JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 004 DATE: ______

SYSTEM/DUTY AREA: A. C. Electrical Distribution

TASK: Perform Synchronized Cross Connect of 480 VAC load-centers 2B1 and 2B2

JTA#: ANO2-RO-480VAC-NORM-15

Alternate Path Yes: X No: ______ Time Critical Yes: ______ No: X

KA VALUE RO: 3.3 SRO: 3.1 KA REFERENCE: 062 A4.01

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 LAB: ______

POSITION EVALUATED: RO: ______ SRO: ______

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

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 12 Minutes

REFERENCE(S): OP 2107.001 Electrical System Operation

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 ______

INITIAL CONDITIONS:

- Unit 2 is in Mode 3.
- Non-Vital 4160VAC busses energized.
- 2B1 and 2B2 are energized.
- Scheduled maintenance must be performed on 2B2 transformer.
- 2B-1 transformer Freon pressure has been verified adequate using 2107.001 Attachment T.
- Turbine Building Cranes are powered from Unit 1 power supply.
- The Operations Manager has given permission to perform Cross Connect of 2B1 and 2B2.

TASK STANDARD:

Cross connected 480VAC non-vital busses 2B1 and 2B2 with 2B2 supplied from 2B1. 2B2 supply breakers opened. Maintained 2B1 amperage less than 138 amps by either uncross tying the busses or direct loads to be reduced.

TASK PERFORMANCE AIDS:

OP 2107.001 Section 12.0.

SIMULATOR SETUP:

Mode 3.
All Non-Vital 4160VAC and 480VAC Busses energized.
REMOTE functions 480CURR2B1 value = 10 and 480CURR2B2 value = 15
REMOTE functions 480CURR2B2 (value = 30) are set for trigger 2.
Conditional triggerT2 should be set for the handswitch to 2B-212 green light (IC4G12CU)

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs you to cross connect 2B1 and 2B2 and separate 2B2 from 2A2 using OP 2107.001 section 12.0.

START TIME:________________

<table>
<tr><th colspan="3">PERFORMANCE CHECKLIST</th><th>STANDARDS</th><th>(Circle One)</th></tr>
<tr><td colspan="5">Procedure Caution:
• Cross-tying buses may cause overload resulting in loss of bus.
• If in Mode 1-4, do not crosstie 2B1, 2B3, 2B7, 2B2, 2B4, and 2B8 except in emergency situations or as otherwise authorized by the Operations Manager. Cross-tying 2B9 and 2B10 is allowed with Ops Manager permission because loss of both buses will not cause a trip.
• Time dependent overcurrent relays exist on all 480V Load Center feeder breakers. They are set at 1600 amps (equates to 185 amps on 4160V AC side). Bus load should not exceed 173 amps (including 7% tolerance).
• Transformer continuous amperage rating at 4160V is 138 amps. Continuous operation > 138 amps will eventually degrade transformer.
• Load Centers should not be cross connected if Loading Transformer Freon pressure is not adequate – Refer to Transformer Temperature vs Pressure (Attachment T).</td></tr>
<tr><td></td><td>1.
(Step 12.1)</td><td><u>IF</u> in Modes 1-4
<u>AND</u> cross connecting for emergency conditions,
<u>THEN</u> proceed with cross-tie operation,
<u>OTHERWISE</u> obtain Operations Manager concurrence.</td><td>Determined that Operations Manager has given approval to cross connect 2B1 and 2B2 at power.</td><td>N/A SAT UNSAT</td></tr>
<tr><td></td><td>2.
(Step 12.2)</td><td><u>IF</u> BOTH buses energized
<u>AND</u> combined load greater than 138 amps,
<u>THEN</u> adjust load as necessary to achieve less than 138 amps combined load.</td><td>On Panel 2C10, summed the current reading of 2B1 and 2B2.

Observed that the summed load is less than 138 amps.

Examiner Note: Amps should be ~122 prior to cross tie.</td><td>N/A SAT UNSAT</td></tr>
<tr><td></td><td>3.
(Step 12.3)</td><td><u>IF</u> desired to cross connect Load Centers 2B1 and 2B2,
<u>THEN</u> perform the following:</td><td>Determined step 12.3 is applicable.</td><td>N/A SAT UNSAT</td></tr>
<tr><td colspan="5">Procedure Note:
The following loads may cycle automatically and should be considered when evaluating loads on bus 2B1 and 2B2. Amperage values are at the 4160V level as indicated on 2C10:
– Electrohydraulic pump 10 amps
– Instrument Air Compressor 10 amps</td></tr>
</table>

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	4. (Step 12.3.1)	Verify Turbine Building Cranes (L-1/2L-1) powered from Unit 1 Power Supply (B-433 and S-06).	Determined from initial conditions that the turbine building cranes are powered from Unit 1.	N/A SAT UNSAT
	5. (Step 12.3.2)	IF cross connecting to energize a de-energized bus, THEN perform the following:	Determined step 12.3.2 is N/A.	N/A SAT UNSAT
(C)	6. (Step 12.3.3)	Place Synchroscope switch for 2B1 - 2B2 Tie 2B132 to ON.	On Panel 2C10, Placed Synchroscope switch into 2B1/2B2 cross-tie slot and rotated clockwise to the ON position.	N/A SAT UNSAT
	7. (Step 12.3.4)	IF cross connecting energized buses, THEN check synchroscope at 12 o'clock position.	On Panel 2C10, Observed that the Synchroscope is at the 12 o'clock position with the Synchroscope switch in the ON position.	N/A SAT UNSAT
(C)	8. (Step 12.3.5)	Close the 2B1/2B2 Cross Tie breaker.	On panel 2C10, rotated the Cross Tie handswitch for 2B1/2B2 clockwise. Observed that the Green light turns OFF and the Red light turns ON above the Cross Tie handswitch.	N/A SAT UNSAT
	9. (Step 12.3.6)	IF desired to separate 480V bus 2B1 from 4160V AC bus 2A1, THEN open the following breakers:	Determined that step 12.3.6 is N/A.	N/A SAT UNSAT
(C)	10. (Step 12.3.7) and (Step 12.3.7.A)	IF desired to separate 480V bus 2B2 from 4160V AC bus 2A2, THEN open the following breakers: LC 2B2 Supply 2B212 (52-212 CS)	On Panel 2C10, rotated the normal feeder supply breaker on 2B2 counter clockwise to the open position. (2B212) Observed that the RED light went OFF and the GREEN light went ON.	N/A SAT UNSAT
(C)	11. (Step 12.3.7.B)	LC 2B2 Feeder 2A202 (152-202 CS)	On Panel 2C10, rotated the transformer feeder breaker on 2A2 to 2B2 counter clockwise to the open position. (2A202) Observed that the RED light went OFF and the GREEN light went ON.	N/A SAT UNSAT

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
Examiners Note: **The following is the Alternate path portion of this JPM**				
(C)	12. (Step 12.3.8)	Verify less than 138 amps on supplying transformer. **EXAMINERS CUE:** **If informed as the CRS that loads are excessive and they should be reduced then report the following: "AO has been directed to secure non-essential loads on 2B1 and 2B2 to reduce loading on 2B1 and 2B2 to less than 138 amps."** **EXAMINERS NOTE:** **Direct operator in simulator instructor's station to reduce loading on 2B1 and 2B2 so that loading is less than 138 amps (use REMOTE malfunctions 480CURR2B1 and 480CURR2B2).**	Observed that the summed load is greater than 138 amps. Directed the AO or informed CRS of need to reduce non-essential loads on 2B1 and 2B2 so that combined loading is less than 130 amps. OR Separated 2B1 and 2B2 using the appropriate section of 2107.001. See Attachment 1 for steps to uncross tie.	N/A SAT UNSAT
	13. (Step 12.3.9)	Place Synchroscope switch for 2B1 - 2B2 Tie 2B132 to OFF.	On Panel 2C10, turned sync switch counter clockwise to the OFF position.	N/A SAT UNSAT
Examiner's Note: **Step 12.3.10 in procedure is not applicable for this JPM as both busses remained energized and the loads removed to reduce amperage on 2B1 will remain deenergized.**				
	14. (Step 12.3.10)	IF EITHER Load Center has been stripped, THEN perform the following:	Determined that step 12.3.10 is N/A.	N/A SAT UNSAT
	15. (Step 12.11)	Maintain supplying transformer temperature less than 220°C Hot Spot temperature and less than 95°C Top temperature while buses cross-connected: **EXAMINER'S CUE:** **"AO has been notified to monitor 2B1 transformer and notify the control room if Hot Spot temperature exceeds 220°C or Top temperature exceeds 95 ^{0}C during cross connected operations."**	Notified AO to monitor 2B1 transformer during cross connected operation and maintain temperature less than 220°C.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

Attachment 1

	PERFORMANCE CHECKLIST		STANDARDS	(Circle One)
Examiner Note: **The following are steps to separate 480V Non-ESF buses**				
	1. (Step 13.1) and (Step 13.1.1)	IF desired to separate Load Centers 2B1 and 2B2 after cross connect, THEN perform the following: Verify 2A1 and 2A2 synchronized by being powered from same electrical source.	Determine that 2A-1 and 2A-2 are both powered from Startup #3.	N/A SAT UNSAT
	2. (Step 13.1.2)	Place Synchroscope switch for 2B1 - 2B2 Tie 2B132 to ON.	On Panel 2C10, Placed Synchroscope switch into 2B1/2B2 cross-tie slot and rotated clockwise to the ON position.	N/A SAT UNSAT
Procedure Note: – A current surge should be expected when closing Bus Supply breaker. Current should return to a proper value.				
	3. (Step 13.1.3)	IF 480V bus 2B1 separated from 4160V AC bus 2A1, THEN perform the following:	Determined step 13.1.3 is N/A.	N/A SAT UNSAT
	4. (Step 13.1.4) and (Step 13.1.4.A)	IF 480V bus 2B2 separated from 4160V AC bus 2A2, THEN perform the following: Close LC 2B2 Feeder 2A202 (152-202 CS).	On panel 2C10, rotated the Cross Tie handswitch for 2A-202 clockwise. OR Checked 2A-202 was still closed. Observed that the Green light OFF and the Red light ON above the 2A-202 handswitch.	N/A SAT UNSAT
(C)	5. (Step 13.1.4.B)	Close LC 2B2 Supply 2B212 (52-212 CS).	On Panel 2C10, rotated the normal feeder supply breaker on 2B2 clockwise to the closed position. (2B212) Observed that the Green light turns OFF and the Red light turns ON above the 2B-212 handswitch.	N/A SAT UNSAT
	6. (Step 13.1.4.B)	Check amperage indication rises.	On Panel 2C10, observed that 2B-2 amperage rose.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	8. (Step 13.1.5)	Open 2B1 - 2B2 Tie 2B132 (52-132 CS)	On panel 2C10, rotated the Cross Tie handswitch for 2B1/2B2 counter clockwise. Observed that the Red light turns OFF and the Geen light turns ON above the Cross Tie handswitch.	N/A SAT UNSAT
Examiner's note: This JPM may be stopped after 2B-1 and 2B-2 are no longer cross tied or load is reduced less than 138 amps.				
	9. (Step 13.1.6)	Place 2B1 - 2B2 Tie 2B132 (52-132 CS) in PTL as desired.	Determined to place 2B132 handswitch is PTL or leave in normal after open.	N/A SAT UNSAT
	10. (Step 13.1.7)	Check normal amp indication on associated buses (less than 138 amps).	On Panel 2C10, observed the current reading of 2B1 and 2B2. Observed each bus load is less than 138 amps.	N/A SAT UNSAT
	11. (Step 13.1.8	Place Synchroscope switch for 2B1 - 2B2 Tie 2B132 to OFF.	On Panel 2C10, turned sync switch counter clockwise to the OFF position.	N/A SAT UNSAT
	12. (Step 13.1.9)	IF any loads remained stripped from bus(es) in cross-tie section, THEN verify those loads restored.	Determined step 13.1.3 is N/A.	N/A SAT UNSAT
END				

STOP TIME:________________

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- Unit 2 is in Mode 3.
- Non-Vital 4160VAC busses energized. 2B1 and 2B2 are energized.
- Scheduled maintenance must be performed on 2B2 transformer.
- 2B-1 transformer Freon pressure has been verified adequate using 2107.001 Attachment T.
- Turbine Building Cranes are powered from Unit 1 power supply.
- The Operations Manager has given permission to perform Cross Connect of 2B1 and 2B2.

INITIATING CUE:

The SM/CRS directs you to cross connect 2B1 and 2B2 and separate 2B2 from 2A2 using OP 2107.001 section 12.0.

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- Unit 2 is in Mode 3.
- Non-Vital 4160VAC busses energized. 2B1 and 2B2 are energized.
- Scheduled maintenance must be performed on 2B2 transformer.
- 2B-1 transformer Freon pressure has been verified adequate using 2107.001 Attachment T.
- Turbine Building Cranes are powered from Unit 1 power supply.
- The Operations Manager has given permission to perform Cross Connect of 2B1 and 2B2.

INITIATING CUE:

The SM/CRS directs you to cross connect 2B1 and 2B2 and separate 2B2 from 2A2 using OP 2107.001 section 12.0.

13.0 SEPARATING 480V NON-ESF BUSES AFTER CROSS CONNECT

13.1 IF desired to separate Load Centers 2B1 and 2B2 after cross connect, THEN perform the following:

13.1.1 Verify 2A1 and 2A2 synchronized by being powered from same electrical source.

13.1.2 Place Synchroscope switch for 2B1 - 2B2 Tie 2B132 to ON.

NOTE

A current surge should be expected when closing Bus Supply breaker. Current should return to a proper value.

13.1.3 IF 480V bus 2B1 separated from 4160V AC bus 2A1, THEN perform the following:

A. Close LC 2B1 Feeder 2A102 (152-102 CS).

B. Close LC 2B1 Supply 2B112 (52-112 CS).

C. Check amperage indication rises.

13.1.4 IF 480V bus 2B2 separated from 4160V AC bus 2A2, THEN perform the following:

A. Close LC 2B2 Feeder 2A202 (152-202 CS).

B. Close LC 2B2 Supply 2B212 (52-212 CS).

C. Check amperage indication rises.

13.1.5 Open 2B1 - 2B2 Tie 2B132 (52-132 CS).

13.1.6 Place 2B1 - 2B2 Tie 2B132 (52-132 CS) in PTL as desired.

13.1.7 Check normal amp indication on associated buses (less than 138 amps).

13.1.8 Place Synchroscope switch for 2B1 - 2B2 Tie 2B132 to OFF.

13.1.9 IF any loads remained stripped from bus(es) in cross-tie section, THEN verify those loads restored.

13.2 IF desired to separate Load Centers 2B3 and 2B4 after cross connect, THEN perform the following:

13.2.1 Verify 2A1 AND 2A2 synchronized by being powered from same electrical source.

13.2.2 Place Synchroscope switch for 2B3 - 2B4 Tie 2B433 to ON.

NOTE

A current surge should be expected when closing Bus Supply breaker. Current should return to a proper value.

13.2.3 IF 480V bus 2B3 separated from 4160V AC bus 2A1, THEN perform the following:

A. Close LC 2B3 Feeder 2A103 (152-103 CS).

B. Close LC 2B3 Supply 2B312 (52-312 CS).

C. Check amperage indication rises.

13.2.4 IF 480V bus 2B4 separated from 4160V AC bus 2A2, THEN perform the following:

A. Close LC 2B4 Feeder 2A203 (152-203 CS).

B. Close LC 2B4 Supply 2B412 (52-412 CS).

C. Check amperage indication rises.

13.2.5 Open 2B3 - 2B4 Tie 2B433 (52-433 CS).

13.2.6 Place 2B3 - 2B4 Tie 2B433 (52-433 CS) in PTL as desired.

13.2.7 Check normal amp indication on associated buses (less than 138 amps).

13.2.8 Place Synchroscope switch for 2B3 - 2B4 Tie 2B433 to OFF.

13.2.9 IF any loads remained stripped from bus(es) in cross-tie section, THEN verify those loads restored.

13.3 IF desired to separate Load Centers 2B7 and 2B8 after cross connect, THEN perform the following:

13.3.1 Verify 2A1 AND 2A2 synchronized by being powered from same electrical source.

13.3.2 Place Synchroscope switch for 2B7 - 2B8 Tie 2B713 to ON.

NOTE

A current surge should be expected when closing Bus Supply breaker. Current should return to a proper value.

13.3.3 IF 480V bus 2B7 separated from 4160V AC bus 2A1, THEN perform the following:

A. Close LC 2B7 Feeder 2A104 (152-104 CS).

B. Close LC 2B7 Supply 2B712 (52-712 CS).

C. Check amperage indication rises.

13.3.4 IF 480V bus 2B8 separated from 4160V AC bus 2A2, THEN perform the following:

A. Close LC 2B8 Feeder 2A204 (152-204 CS).

B. Close LC 2B8 Supply 2B812 (52-812 CS).

C. Check amperage indication rises.

13.3.5 Open 2B7 - 2B8 Tie 2B713 (52-713 CS).

13.3.6 Place 2B7 - 2B8 Tie 2B713 (52-713 CS) in PTL as desired.

13.3.7 Check normal amp indication on associated buses (less than 138 amps).

13.3.8 Place Synchroscope switch for 2B7 - 2B8 Tie 2B713 to OFF.

13.3.9 IF any loads remained stripped from bus(es) in cross-tie section, THEN verify those loads restored.

13.4 IF desired to separate Load Centers 2B9 and 2B10 after cross connect, THEN perform the following:

13.4.1 Verify 2A1 AND 2A2 synchronized by being powered from same electrical source.

13.4.2 Place Synchroscope switch for 2B9 - 2B10 Tie 2B913 to ON.

NOTE

A current surge should be expected when closing Bus Supply breaker. Current should return to a proper value.

13.4.3 IF 480V bus 2B9 separated from 4160V AC bus 2A1, THEN perform the following:

A. Close LC 2B9 Feeder 2A109 (152-109 CS).

B. Close LC 2B9 Supply 2B912 (52-912 CS).

C. Check amperage indication rises.

13.4.4 IF 480V bus 2B10 separated from 4160V AC bus 2A2, THEN perform the following:

A. Close LC 2B10 Feeder 2A209 (152-209 CS).

B. Close LC 2B10 Supply 2B1012 (52-1012 CS).

C. Check amperage indication rises.

13.4.5 Open 2B9 - 2B10 Tie 2B913 (52-913 CS).

13.4.6 Place 2B9 - 2B10 Tie 2B913 (52-913 CS) in PTL as desired.

13.4.7 Check normal amp indication on associated buses (less than 138 amps).

13.4.8 Place Synchroscope switch for 2B9 - 2B10 Tie 2B913 to OFF.

13.4.9 IF any loads remained stripped from bus(es) in cross-tie section, THEN verify those loads restored.

12.0 CROSS CONNECTING 480V NON-ESF BUSES

CAUTION

- Cross-tying buses may cause overload resulting in loss of bus.
- If in Mode 1-4, do not crosstie 2B1, 2B3, 2B7, 2B2, 2B4, and 2B8 except in emergency situations or as otherwise authorized by the Operations Manager. Cross-tying 2B9 and 2B10 is allowed with Ops Manager permission because loss of both buses will not cause a trip.
- Time dependent overcurrent relays exist on all 480V Load Center feeder breakers. They are set at 1600 amps (equates to 185 amps on 4160V AC side). Bus load should not exceed 173 amps (including 7% tolerance).
- Transformer continuous amperage rating at 4160V is 138 amps. Continuous operation > 138 amps will eventually degrade transformer.
- Load Centers should not be cross connected if Loading Transformer Freon pressure is not adequate – Refer to Transformer Temperature vs Pressure (Attachment T).

12.1 IF in Modes 1-4
AND cross connecting for emergency conditions,
THEN proceed with cross-tie operation,
OTHERWISE obtain Operations Manager concurrence.

12.2 IF BOTH buses energized
AND combined load greater than 138 amps,
THEN adjust load as necessary to achieve less than 138 amps combined load.

12.3 IF desired to cross connect Load Centers 2B1 and 2B2,
THEN perform the following:

NOTE

The following loads may cycle automatically and should be considered when evaluating loads on bus 2B1 and 2B2. Amperage values are at the 4160V level as indicated on 2C10:

–	Electrohydraulic pump	10 amps
–	Instrument Air Compressor	10 amps

12.3.1 Verify Turbine Building Cranes (L-1/2L-1) powered from Unit 1 Power Supply (B-433 and S-06).

12.3.2 IF cross connecting to energize a de-energized bus,
THEN perform the following:

A. Strip all loads from de-energized Load Center.

(Step 12.3 continued on next page)

B. Verify de-energized Load Center Supply bkrs open:

- LC 2B1 Supply 2B112 (52-112 CS)
- LC 2B1 Feeder 2A102 (152-102 CS)

OR

- LC 2B2 Supply 2B212 (52-212 CS)
- LC 2B2 Feeder 2A202 (152-202 CS)

C. Complete Configuration Control module entry for any repositioned breakers.

12.3.3 Place Synchroscope switch for 2B1 - 2B2 Tie 2B132 to ON.

12.3.4 IF cross connecting energized buses,
THEN check synchroscope at 12 o'clock position.

12.3.5 Close 2B1 - 2B2 Tie 2B132 (52-132 CS).

12.3.6 IF desired to separate 480V bus 2B1 from 4160V AC bus 2A1,
THEN open the following breakers:

A. LC 2B1 Supply 2B112 (52-112 CS)

B. LC 2B1 Feeder 2A102 (152-102 CS)

12.3.7 IF desired to separate 480V bus 2B2 from 4160V AC bus 2A2,
THEN open the following breakers:

A. LC 2B2 Supply 2B212 (52-212 CS)

B. LC 2B2 Feeder 2A202 (152-202 CS)

12.3.8 Verify less than 138 amps on supplying transformer.

12.3.9 Place Synchroscope switch for 2B1 - 2B2 Tie 2B132 to OFF.

12.3.10 IF EITHER Load Center has been stripped,
THEN perform the following:

A. Energize loads as directed by SM.

B. Update Configuration Control module as necessary.

* 12.3.11 Maintain supplying transformer temperature less than 220°C Hot Spot temperature and less than 95°C Top temperature while buses cross-connected:

- 2TIS-6710/2TIS-6710A (2B1)
- 2TIS-6711/2TIS-6711A (2B2)

* 12.3.12 Maintain less than 138 amps on supplying transformer while buses cross-connected.

12.4 IF desired to cross connect Load Centers 2B3 and 2B4, THEN perform the following:

NOTE

The following loads may cycle automatically and should be considered when evaluating loads on bus 2B3 and 2B4. Amperage values are at the 4160V level as indicated on 2C10:

– Condenser Vacuum pump 9 amps

12.4.1 IF cross connecting to energize a de-energized bus, THEN perform the following:

A. Strip all loads from de-energized Load Center.

B. Verify de-energized Load Center Supply bkrs open:

- LC 2B3 Supply 2B312 (52-312 CS)
- LC 2B3 Feeder 2A103 (152-103 CS)

OR

- LC 2B4 Supply 2B412 (52-412 CS)
- LC 2B4 Feeder 2A203 (152-203 CS)

C. Complete Configuration Control module entry for any repositioned breakers.

12.4.2 Place Synchroscope switch for 2B3 - 2B4 Tie 2B433 to ON.

12.4.3 IF cross connecting energized buses, THEN check synchroscope at 12 o'clock position.

12.4.4 Close 2B3 - 2B4 Tie 2B433 (52-433 CS).

12.4.5 IF desired to separate 480V bus 2B3 from 4160V AC bus 2A1, THEN open the following breakers:

A. LC 2B3 Supply 2B312 (52-312 CS)

B. LC 2B3 Feeder 2A103 (152-103 CS)

12.4.6 IF desired to separate 480V bus 2B4 from 4160V AC bus 2A2, THEN open the following breakers:

A. LC 2B4 Supply 2B412 (52-412 CS)

B. LC 2B4 Feeder 2A203 (152-203 CS)

12.4.7 Verify less than 138 amps on supplying transformer.

12.4.8 Place Synchroscope switch for 2B3 - 2B4 Tie 2B433 to OFF.

(Step 12.4 continued on next page)

12.4.9 IF EITHER Load center has been stripped, THEN perform the following:

A. Energize loads as directed by SM.

B. Update Configuration Control module as necessary.

* 12.4.10 Maintain supplying transformer temperature less than 220°C Hot Spot temperature and less than 95°C Top temperature while buses cross-connected:

- 2TIS-6712/2TIS-6712A (2B3)
- 2TIS-6713/2TIS-6713A (2B4)

* 12.4.11 Maintain less than 138 amps on supplying transformer while buses cross-connected.

12.5 IF desired to cross connect Load Centers 2B7 and 2B8, THEN perform the following:

NOTE

MG set loads may cycle during CEA movement. Amperage values are at the 4160V level are indicated on 2C10. Minimize CEA movement while 2B7 and 2B8 are cross connected.

12.5.1 IF cross connecting to energize a de-energized bus, THEN perform the following:

A. Strip all loads from de-energized Load Center.

B. Verify de-energized Load Center Supply bkrs open:

- LC 2B7 Supply 2B712 (52-712 CS)
- LC 2B7 Feeder 2A104 (152-104 CS)

OR

- LC 2B8 Supply 2B812 (52-812 CS)
- LC 2B8 Feeder 2A204 (152-204 CS)

C. Complete Configuration Control module entry for any repositioned breakers.

12.5.2 Place Synchroscope switch for 2B7 - 2B8 Tie 2B713 to ON.

12.5.3 IF cross connecting energized buses, THEN check synchroscope at 12 o'clock position.

12.5.4 Close 2B7 - 2B8 Tie 2B713 (52-713 CS).

(Step 12.5 continued on next page)

12.5.5 IF desired to separate 480V bus 2B7 from 4160V AC bus 2A1, THEN open the following breakers:

A. LC 2B7 Supply 2B712 (52-712 CS)

B. LC 2B7 Feeder 2A104 (152-104 CS)

12.5.6 IF desired to separate 480V bus 2B8 from 4160V AC bus 2A2, THEN open the following breakers:

A. LC 2B8 Supply 2B812 (52-812 CS)

B. LC 2B8 Feeder 2A204 (152-204 CS)

12.5.7 Verify less than 138 amps on supplying transformer.

12.5.8 Place Synchroscope switch for 2B7 - 2B8 Tie 2B713 to OFF.

12.5.9 IF EITHER Load center has been stripped, THEN perform the following:

A. Energize loads as directed by SM.

B. Update Configuration Control module as necessary.

* 12.5.10 Maintain supplying transformer temperature less than 220°C Hot Spot temperature and less than 95°C Top temperature while buses cross-connected:

- 2TIS-6716/2TIS-6716A (2B7)
- 2TIS-6717/2TIS-6717A (2B8)

* 12.5.11 Maintain less than 138 amps on supplying transformer while buses cross-connected.

12.6 IF desired to cross connect Load Centers 2B9 and 2B10, THEN perform the following:

NOTE

The following loads may cycle automatically and should be considered when evaluating loads on bus 2B9 and 2B10. Amperage values are at the 4160V level as indicated on 2C10:

– Pressurizer Backup heaters 20 amps

12.6.1 IF cross connecting to energize a de-energized bus, THEN perform the following:

A. Strip all loads from de-energized Load Center.

B. Verify de-energized Load Center Supply bkrs open:

- LC 2B9 Supply 2B912 (52-912 CS)
- LC 2B9 Feeder 2A109 (152-109 CS)

OR

- LC 2B10 Supply 2B1012 (52-1012 CS)
- LC 2B10 Feeder 2A209 (152-209 CS)

C. Complete Configuration Control module entry for any repositioned breakers.

12.6.2 Place Synchroscope switch for 2B9 - 2B10 Tie 2B913 to ON.

12.6.3 IF cross connecting energized buses, THEN check synchroscope at 12 o'clock position.

12.6.4 Close 2B9 - 2B10 Tie 2B913 (52-913 CS).

12.6.5 IF desired to separate 480V bus 2B9 from 4160V AC bus 2A1, THEN perform the following:

A. Verify Pressurizer Backup heater(s) selected for service (Handswitch in ON) are powered from Load Center 2B10.

B. Open LC 2B9 Supply 2B912 (52-912 CS).

C. Open LC 2B9 Feeder 2A109 (152-109 CS).

(Step 12.6 continued on next page)

12.6.6 IF desired to separate 480V bus 2B10 from 4160V AC bus 2A2, THEN perform the following:

A. Verify Pressurizer Backup heater(s) selected for service (Handswitch in ON) are powered from Load Center 2B9.

B. Open LC 2B10 Supply 2B1012 (52-1012 CS).

C. Open LC 2B10 Feeder 2A209 (152-209 CS).

12.6.7 Verify less than 138 amps on supplying transformer.

12.6.8 Place Synchroscope switch for 2B9 - 2B10 Tie 2B913 to OFF.

12.6.9 IF EITHER Load center has been stripped, THEN perform the following:

A. Energize loads as directed by SM.

B. Update Configuration Control module as necessary.

* 12.6.10 Maintain supplying transformer temperature less than 220°C Hot Spot temperature and less than 95°C Top temperature while buses cross-connected:

- 2TIS-6718/2TIS-6718A (2B9)
- 2TIS-6719/2TIS-6719A (2B10)

* 12.6.11 Maintain less than 138 amps on supplying transformer while buses cross-connected.

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 010 **DATE:** ______

SYSTEM/DUTY AREA: Control Element Drive Mechanism Control System

TASK: Test a Reactor Trip Circuit Breaker

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

Alternate Path Yes: ____ No: X **Time Critical** Yes: ____ No: X

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: ____ **SIMULATOR:** Perform **LAB:** ____

POSITION EVALUATED: RO: ____ SRO: ____

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

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): OP 2105.009 CEDM Control System Operation

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** ____

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- TCB-02 has been repaired following a component malfunction
- The plant is in Mode 3
- Supplement 1 Section 1.0 of 2105.009 is completed
- An operator is standing by in the CEDM room

TASK STANDARD:

- TCB-2 closed then the shunt trip tested.
- TCB-2 closed then the undervoltage trip tested.
- TCB-2 and TCB-6 left closed.

TASK PERFORMANCE AIDS:

OP 2105.009 Supplement 1.0 section 2.1 and 2.2. TCB Close Key (Key #15).

SIMULATOR SETUP:

TCB 9 closed. TCB 2 is open.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs you to 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 and TCB-6 closed.

Start Time: _________________

		PERFORMANCE CHECKLIST	STANDARDS	(Circle One)
Procedure Caution: • If TCB Undervoltage Trip Device Armature NOT in contact with Air Gap Adjustment Screw, breaker may not open when required. • If a stuck out CEA exists then TCBs should not be closed since this could result in an inadequate shutdown margin.				
	1. (Step 2.1.1)	Verify Undervoltage Trip Device Armature in contact with Air Gap Adjustment Screw IAW Plant Heatup (2102.002), Exhibit 1, "Undervoltage Trip Device". **Examiner Cue:** **CEDM Room operator reports UV Trip Device armatures for TCB-2 is in contact with air gap adjusting screw IAW Exhibit 1.**	Contacted operator in CEDM room. Requested verification of position of UV trip device armatures for TCB-2 using the local exhibit.	N/A SAT UNSAT
	2. (Step 2.1.2)	Obtain CPC Test/TCB close key (#15) from SM key locker. **Examiner Cue:** **When Examinee request key 15 provide them with the key.**	CPC Test/TCB close key (#15) obtained from SM key locker.	N/A SAT UNSAT
(C)	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 for TCB-2/6.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	4. (Step 2.1.4)	Close TCB-2 using pushbutton on 2C23.	Depress TCB-2 reset push button. **(critical portion)** On panel 2C23 or panel 2C14, verified red light ON for TCB-2.	N/A SAT UNSAT
	5. (Step 2.1.5)	On 2C23, place applicable Reset Actuation Trip Patch keylock in LK.	Placed key in LOCK position.	N/A SAT UNSAT
Perform the following to test Shunt Trip:				
	6. (Step 2.2)	Verify TCB-2 closed per step 2.1	Verified TCB-2 closed per step 2.1	N/A SAT UNSAT
	7. (Step 2.2)	Hold 2HS/TEST switch in UV Bypass position. **<u>Examiner Cue:</u>** **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)	Momentarily depress Reactor Trip pushbutton (2HS-907l-2) on 2C03.	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

JOB PERFORMANCE MEASURE

	PERFORMANCE CHECKLIST		STANDARDS	(Circle One)
	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
EVALUATORS NOTE: The simulator does model 2K426.				
	12. (Step 2.2)	Verify reflash Unit 2K426 in 2C14 reset.	In panel 2C-14, depresses R on 2K426 to reset the reflash unit.	N/A SAT UNSAT
	13. (Step 2.1.1)	Verify Undervoltage Trip Device Armature in contact with Air Gap Adjustment Screw IAW Plant Heatup (2102.002), Exhibit 1, "Undervoltage Trip Device". **Examiner Cue**: **CEDM Room operator reports UV Trip Device armatures for TCB-2 is in contact with air gap adjusting screw IAW Exhibit 1.**	Contacted operator in CEDM room. Requested verification of position of UV trip device armatures for TCB-2.	N/A SAT UNSAT
	14. (Step 2.1.2)	Obtain CPC Test/TCB close key (#15) from SM key locker. **Examiner Note:** **Examinee should have the key from earlier.**	CPC Test/TCB close key (#15) obtained from SM key locker.	N/A SAT UNSAT
(C)	15. (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 for TCB-2/6.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	16. (Step 2.1.4)	Close TCB-2 using pushbutton on 2C23.	Depress TCB-2 reset push button. **(critical portion)** On panel 2C23 or panel 2C14, verified red light ON for TCB-2.	N/A SAT UNSAT
	17. (Step 2.1.5)	On 2C23, place applicable Reset Actuation Trip Patch keylock in LK.	Placed key in LOCK position.	N/A SAT UNSAT
Perform the following to test UV Trip:				
	18. (Step 2.2)	Verify TCB-2 closed per step 2.1	Verified TCB-2 closed per step 2.1	N/A SAT UNSAT
	19. (Step 2.2)	Hold 2HS/TEST switch in Shunt Bypass position. **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)	20. (Step 2.2)	Momentarily depress Reactor Trip pushbutton (2HS-907l-2) on 2C03.	On panel 2C03, depressed push button 2HS-9071-2.	N/A SAT UNSAT
	21. (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
	22. (Step 2.2)	Check 2K12-A10 alarm comes in or reflashes.	On annunciator panel 2K12, acknowledged that 2K12-A10 actuated.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	23. (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.				
	24. (Step 2.2)	Verify reflash Unit 2K426 in 2C14 reset.	In panel 2C-14, depresses R on 2K426 to reset the reflash unit.	N/A SAT UNSAT
	25. (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)	26. (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 for TCB-2/6. 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. **(Not Critical)** Placed key in LOCK position.	N/A SAT UNSAT
END				

Stop Time: _________________

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- TCB-02 has been repaired following a component malfunction
- The plant is in Mode 3
- Supplement 1 Section 1.0 of 2105.009 is completed
- An operator is standing by in the CEDM room

INITIATING CUE:

The CRS directs you to 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 and TCB-6 closed.

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- TCB-02 has been repaired following a component malfunction
- The plant is in Mode 3
- Supplement 1 Section 1.0 of 2105.009 is completed
- An operator is standing by in the CEDM room

INITIATING CUE:

The CRS directs you to 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 and TCB-6 closed.

SUPPLEMENT 1

REACTOR TRIP CIRCUIT BREAKER TEST

This test completed prior to each Reactor Startup unless performed in previous seven days IAW 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.

- 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.

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

2.0 TEST METHOD

CAUTION

- If TCB Undervoltage Trip Device Armature NOT in contact with Air Gap Adjustment Screw, breaker may not open when required.
- If a stuck out CEA exists then TCBs should not be closed since this could result in an inadequate shutdown margin.

* 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 IAW Plant Heatup (2102.002), Exhibit 1, "Undervoltage Trip Device".

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.

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 IAW step 2.1		N/A
Hold XHS/TEST in UV Bypass position. (X is TCB #)		N/A
Momentarily depress Reactor Trip pushbutton (2HS-907l-2) on 2C03.		N/A
Verify TCB opens.		N/A
Check 2K12-A10 alarm comes in or reflashes.		N/A
Release XHS/TEST. (X is TCB #)		N/A
Verify Reflash Unit 2K426 in 2C14 reset.		N/A
Perform the following to test UV Trip:	N/A	N/A
Verify TCB closed IAW step 2.1		N/A
Hold XHS/TEST in Shunt Bypass position. (X is TCB #)		N/A
Momentarily depress Reactor Trip pushbutton (2HS-907l-2) on 2C03.		N/A
Verify TCB opens.		N/A
Check 2K12-A10 alarm comes in or reflashes.		N/A
Release XHS/TEST. (X is TCB #)		N/A
Verify Reflash Unit 2K426 in 2C14 reset.		N/A

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

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 002 **DATE:** ______

SYSTEM/DUTY AREA: Spent Fuel Pool Cooling System

TASK: Line up to fill the spent fuel pool from CVCS

JTA#: ANO2-WCO-SFP-NORM-18

Alternate Path Yes: ______ No: X **Time Critical** Yes: ______ No: X

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:** ______ **LAB:** ______

POSITION EVALUATED: RO: ______ SRO: ______

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

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 20 Minutes

REFERENCE(S): OP 2104.006, Section 10.0

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** ______

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- The Plant is shutdown and in Mode 6 with the core off loaded.
- 2K11-J5, FUEL POOL LEVEL LOW is in alarm.
- The Crew has entered Spent Fuel Pool emergencies.
- SFP level is 401' 0" due to a leak on a SFP cooling pump packing gland which is being isolated.
- SFP purification is aligned to the RWT.
- RCS Makeup is aligned to the charging pump suction.
- The SFP tilt pit gate is installed.

TASK STANDARD:

Established a flow path to allow make up to the Spent Fuel Pool by closing manual makeup to the charging pump suction and opening manual make up valves to the Spent Fuel Pool:

TASK PERFORMANCE AIDS:

OP 2104.006, Fuel Pool systems, Section 10.0

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs you to align for makeup water addition to the SFP system from CVCS using OP 2104.006, Section 10.0 beginning with step 10.8. Steps 10.1 through 10.7 have been completed.

START TIME:________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
Procedure Note: • SFP volume ~ 470 gal/inch • SFP/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) • Normal SFP level maintained between 401'4" and 401'6"				
(C)	1. (Step 10.8.1)	Fuel Pool Purification pump (2P-66) OFF (2HS-5411). **Examiner Note: 2P-66 should be found running for this JPM.** **<u>Examiner Cue:</u>** **Describe that Fuel Pool Purification pump 2P-66 is off after applicant takes action to place the HS in off (red light off, green light on).**	Examinee locally stopped 2P-66 by placing 2HS-5411 in "OFF". Examinee observed red light OFF; green light ON above 2HS-5411.	N/A SAT UNSAT
<u>TRANSITION NOTE:</u> Go to elevation 354' RAB spent fuel pool valve gallery.				
	2. (Step 10.8.2)	RWT to Fuel Pool Isol (2FP-46) closed. **Examiner Note: 2FP-46 should be found open for this JPM.** **<u>Examiner Cue:</u>** **Describe that RWT to Fuel Pool Isol (2FP-46) is closed (stem inserted, resistance felt when turning clockwise) after operation.**	Examinee closed 2FP-46 by turning handwheel clockwise. Examinee observed stem fully inserted into the valve.	N/A SAT UNSAT
(C)	3. (Step 10.8.3)	Borated MU or RWT to 2P-66 (2FP-32) closed. **Examiner Note: 2FP-32 should be found open for this JPM.** **<u>Examiner Cue:</u>** **Describe that Borated MU or RWT to 2P-66 (2FP-32) is closed (stem inserted, resistance felt when turning**	Examinee closed 2FP-32 by turning handwheel clockwise. Examinee observed stem fully inserted into the valve.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
		clockwise)after operation.		
TRANSITION NOTE: Go to elevation 354' RAB VCT valve gallery.				
(C)	4. (Step 10.9) First bullet	Verify following valves closed: • Manual Makeup to Charging Pump suction (2CVC-83) **Examiner Note: 2CVC-83 should be found open for this JPM.** **Examiner Cue:** **Describe that Manual Makeup to Charging Pump suction (2CVC-83) is closed (stem inserted, resistance felt when turning clockwise) after operation.**	Examinee closed 2CVC-83 by pulling on right-hand side of chain (from the chain operator). Examinee observed valve closed position indication on valve reach rod actuator.	N/A SAT UNSAT
	5. (Step 10.9) Second bullet	Verify following valves closed: • Manual Makeup to VCT (2CVC-68) **Examiner Note: 2CVC-68 should be found closed for this JPM.** **Examiner Cue:** **Describe that Manual Makeup to VCT (2CVC-68) is closed (stem inserted, resistance felt when turning clockwise).**	Examinee attempted to rotate reach rod handwheel clockwise noting resistance to motion. Examinee observed valve closed position indication on valve reach rod actuator.	N/A SAT UNSAT
TRANSITION NOTE: Go to elevation 354' RAB spent fuel pool valve gallery.				
(C)	6. (Step 10.10) First bullet	Verify following valves open: • MU to SF Pool (2CVC-66) **Examiner Note: 2CVC-66 should be found closed for this JPM.** **Examiner Cue:** **Describe that MU to SF Pool (2CVC-66) is open (stem extended, resistance felt in the counter clockwise direction).**	Examinee opened 2CVC-66 by rotating handwheel counter clockwise. Examinee observed valve stem fully withdrawn out of the valve.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	7. (Step 10.10) Second bullet	Verify following valves open: • Borated MU to Fuel Pool (2CVC-67) **Examiner Note: 2CVC-67 should be found closed for this JPM.** **<u>Examiner Cue:</u>** **Describe that Borated MU to Fuel Pool (2CVC-67) is open (stem extended, resistance felt in the counter clockwise direction).**	Examinee opened 2CVC-67 by rotating handwheel counter clockwise. Examinee observed valve stem fully withdrawn out of the valve.	N/A SAT UNSAT
(C)	8. (Step 10.10) Third bullet	Verify following valves open: • Borated MU, RWT, SW to Fuel Pool (2FP-31) **Examiner Note: 2FP-31 should be found closed for this JPM.** **<u>Examiner Cue:</u>** **Describe that Borated MU, RWT, SW to Fuel Pool (2FP-31) is open (stem extended, resistance felt in the counter clockwise direction).**	Examinee opened 2FP-31 by rotating handwheel counter clockwise. Examinee observed valve stem fully withdrawn out of the valve.	N/A SAT UNSAT
	9.	Notify Control Room that Spent Fuel Pool make up alignment is complete. <u>POSITIVE CUE:</u> Understand make up alignment is complete, standby to secure alignment once Spent Fuel Pool level has been restored.	Using the phone or radio, examinee contacted Control Room and reported that Spent Fuel Pool alignment is complete.	N/A SAT UNSAT
END				

STOP TIME:________________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- The Plant is shutdown and in Mode 6 with the core off loaded.
- 2K11-J5, FUEL POOL LEVEL LOW is in alarm.
- The Crew has entered Spent Fuel Pool emergencies.
- SFP level is 401' 0" due to a leak on a SFP cooling pump packing gland which is being isolated.
- SFP purification is aligned to the RWT.
- RCS Makeup is aligned to the charging pump suction.
- The SFP tilt pit gate is installed.

INITIATING CUE:

The SM/CRS directs you to align for makeup water addition to the SFP system from CVCS using OP 2104.006, Section 10.0 beginning with step 10.8. Steps 10.1 through 10.7 have been completed.

JOB PERFORMANCE MEASURE

EXAMINEE'S Copy

INITIAL CONDITIONS:

- The Plant is shutdown and in Mode 6 with the core off loaded.
- 2K11-J5, FUEL POOL LEVEL LOW is in alarm.
- The Crew has entered Spent Fuel Pool emergencies.
- SFP level is 401' 0" due to a leak on a SFP cooling pump packing gland which is being isolated.
- SFP purification is aligned to the RWT.
- RCS Makeup is aligned to the charging pump suction.
- The SFP tilt pit gate is installed.

INITIATING CUE:

The SM/CRS directs you to align for makeup water addition to the SFP system from CVCS using OP 2104.006, Section 10.0 beginning with step 10.8. Steps 10.1 through 10.7 have been completed.

10.0 NORMAL FUEL POOL MAKEUP FROM CVCS

> **CAUTION**
>
> **R A P**
>
> The following section has been determined to have a Reactivity Addition Potential (RAP) and this activity is classified as a Risk Level R4.

N/A 10.1 IF a Reactivity Management Brief has NOT been conducted, THEN perform a Reactivity Management Brief per COPD-030 with an SRO.

> **NOTE**
>
> - SFP volume ~ 470 gal/inch
> - SFP/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)
> - Normal SFP level maintained between 401'4" and 401'6"

N/A {4.3.2} 10.2 **IF Cask Loading Operations are in progress, THEN coordinate with Dry Fuel personnel prior to makeup.**

N/A 10.3 IF makeup is due to loss from normal evaporation ONLY AND NOT desired to raise SFP Boron concentration, THEN calculate amount of water needed to restore level using NOTE above for guidance.

10.4 IF makeup for other than normal evaporation OR desired to adjust SFP Boron concentration during makeup, THEN perform applicable calculation IAW Attachment F OR Boron 2 Program.

10.5 Notify Chemistry that SFP Makeup will be aligned and if currently required the Quarterly Sample of DI water can be obtained from Sample Valve on Fuel Pool Feed Line (2CVC-122).

10.6 Verify Chemical Addition portion of CVCS available.

10.7 Verify VCT Makeup Valve (2CV-4941-2) closed.

10.8 IF Purification NOT in service OR aligned to RWT, THEN verify the following:

10.8.1 Fuel Pool Purification pump (2P-66) OFF (2HS-5411).

10.8.2 RWT to Fuel Pool Isol (2FP-46) closed.

10.8.3 Borated MU or RWT to 2P-66 (2FP-32) closed.

10.9 Verify following valves closed:

- Manual Makeup to Charging Pump suction (2CVC-83)
- Manual Makeup to VCT (2CVC-68)

10.10 Verify following valves open:

- MU to SF Pool (2CVC-66)
- Borated MU to Fuel Pool (2CVC-67)
- Borated MU, RWT, SW to Fuel Pool (2FP-31)

CRITICAL STEP

> **NOTE**
> If CLP (2LI-5400) used as SFP level indication during SFP drain and fill evolutions, SFP and CLP levels will differ slightly until water levels equalize through seal area.

* 10.11 Station Operator in communication with Control Room to continuously monitor Spent Fuel Pool level until evolution complete:

- SFP (2LI-5401)
- CLP (2LI-5400) if gate removed or seal deflated

* 10.12 Monitor Reactor Power during makeup to Fuel Pool to detect seat leakage from the following valves:

- VCT Makeup Valve (2CV-4941-2)
- Manual Makeup to VCT (2CVC-68)
- Manual Makeup to Charging Pump suction (2CVC-83).

CAUTION

- If SFP overfilled, water can spill through SFP Cooling/SFP Purification pipe chase (SFP, ~ 402', SW corner) and contaminate SFP valve gallery (AB 354') and hall near 2F-3A/B (AB 335')
- If flow introduced with level > 401' 7", some overflow can occur due to wave motion of water.

10.13 Align for addition as follows:

NOTE

When blending, setting controllers so boric acid addition secures ~ 50 gallons before water addition secures allows flush of boric acid from blending line.

10.13.1 IF adding water,
THEN perform the following:

A. Verify either RMW pump running:

- 2P-109A
- 2P-109B

B. Set RMW Flow controller (2FIC-4927) to needed flow.

C. IF NOT adding Boric Acid,
THEN verify the following on Boric Acid MU Flow Controller (2FIC-4926):

- Select switch in MANUAL.
- Output Demand < zero.

10.13.2 IF adding Boric Acid,
THEN perform the following:

A. Verify BAM Pump Select switch (2HS-4911-2) aligned to desired BAM pump:

- 2P-39A
- 2P-39B

B. Start selected BAM pump:

- 2P-39A
- 2P-39B

C. Open associated Recirc:

- 2P-39A (2CV-4903-2)
- 2P-39B (2CV-4915-2)

D. Set Boric Acid MU Flow Controller (2FIC-4926) to needed flow.

E. IF NOT adding water,
THEN verify the following on RMW Flow Controller (2FIC-4927):

- Selected to MANUAL.
- Output demand < zero.

10.13.3 Reset Flow totalizers to zero:

- BA MU Flow (2FQI-4926)
- RMW Flow (2FQI-4927)

10.13.4 Verify BAM Pump Select switch (2HS-4911-2) aligned to desired BAM pump:

- 2P-39A
- 2P-39B

10.13.5 Place MU Mode Selector switch (2HS-4928) to MANUAL.

10.13.6 IF selected BAM pump Auto starts,
THEN verify associated Recirc for selected BAM pump open:

- 2P-39A (2CV-4903-2)
- 2P-39B (2CV-4915-2)

10.13.7 Verify BA MU Flow (2FIC-4926) indicates correct flow.

10.13.8 Verify RMW Flow (2FIC-4927) indicates correct flow.

10.14 WHEN calculated amounts of boric acid and/or water added OR Operator monitoring level determines desired level reached, THEN perform the following:

10.14.1 Reposition MU Mode Selector switch (2HS-4928) as desired.

10.14.2 Verify 2CV-4927 closed.

10.14.3 Verify 2CV-4926 closed.

10.14.4 Verify applicable BAM pumps secured:

- 2P-39A
- 2P-39B

10.14.5 Verify applicable BAM Pump Recirc valves closed:

- 2CV-4903-2
- 2CV-4915-2

10.14.6 IF only Boric Acid was added to the SFP, THEN flush blending tee with ~ 50 gallons of water as follows:

A. Verify EITHER 2P-109 pump in service.

B. Set Reactor Makeup Water Flow controller (2FIC-4927) setpoint to desired flow rate.

C. Reset Reactor Makeup Water Flow totalizer (2FQI-4927) to zero so total gallons of makeup can be determined.

D. Verify the following on Boric Acid MU Flow Controller (2FIC-4926):

- Select switch in MANUAL.
- Output Demand < zero.

E. Place Mode selector switch (2HS-4928) to MANUAL.

F. Verify 2FIC-4927 indicates desired flowrate.

G. WHEN ~ 50 gallons of water added, THEN reposition Mode Select switch as desired.

H. Verify 2CV-4927 closed.

10.14.7 Secure Operator from SFP level monitoring station.

10.14.8 Close the following valves:

- Borated MU, RWT, SW to Fuel Pool (2FP-31)
- Borated MU to Fuel Pool (2CVC-67)
- MU to SF Pool (2CVC-66)

10.14.9 Return flow controllers to desired settings:

- RMW Flow Controller (2FIC-4927)
- BA MU Flow Controller (2FIC-4926)

10.15 Open Manual Makeup to Charging Pump Suction (2CVC-83).

10.16 IF makeup was for other than normal evaporation,
THEN request Chemistry to sample SFP.

10.17 Align Purification System as desired using applicable section of this procedure.

10.18 Reset Flow totalizers to zero:

- BA MU Flow (2FQI-4926)
- RMW Flow (2FQI-4927)

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 001 **DATE:** ________

SYSTEM/DUTY AREA: 125VDC Electrical Distribution System

TASK: Swap in-service Battery Chargers

JTA#: ANO2-AO-125DC-NORM-8

Alternate Path Yes: X No: ____ **Time Critical** Yes: ____ No: X

KA VALUE RO: 2.8 SRO: 3.1 **KA REFERENCE:** 063 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:** ____ **LAB:** ____

POSITION EVALUATED: RO: ____ SRO: ____

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

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 10 Minutes

REFERENCE(S): OP-2107.004 Attachment B-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** ____

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- Plant is at 100% power.
- 2D-31A Red Train Battery Charger is in service.
- 2D-31B Red Train Battery Charger is secured.
- Preventative Maintenance is scheduled for 2D-31A
- 2107.004 Attachment B-1 initial conditions have been completed (Section 1)

TASK STANDARD:

Placed 2D-31B battery charging in service by closing the AC input breaker, DC output breaker, and opening 2D-31A DC output breaker and AC input breaker. Recognized that 2D-31B did not pick up load then placed 2D-31A back in service by closing the AC input breaker then the DC output breaker.

TASK PERFORMANCE AIDS:

OP-2107.004 attachment B-1

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs you to place 2D-31B Battery Charger in service using OP-2107.004 Attachment B-1 beginning with step 2.1.

START TIME: _______________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	1. (Step 2.1)	Close 2D-31B AC input breaker (B301). Examiner note: AC input voltage and DC output voltage should rise to normal values when the breaker is closed. **Examiner Cue:** **Describe that 2D-31B AC input breaker B301 indicates closed (up position).**	On 2D-31B, closed B301 AC input breaker.	N/A SAT UNSAT
Procedure Note: FLOAT/EQL switch (2HS-9104) is spring return to mid-position switch.				
	2. (Step 2.2)	Verify Green FLOAT indicating light lit on 2D-31B. **Examiner Cue:** **Describe that the green float light is illuminated.**	On 2D-31B, observed that the green float light was lit.	N/A SAT UNSAT
	3. (Step 2.3)	Check the following: • 2D-31B DC output voltage ~ 130 VDC (V301). • AC input voltage normal ~ 480 VAC (V302). **Examiner Cue:** **Describe that output voltage indicates ~130 volts and AC input voltage indicates ~480 volts by indicating the approximate readings.**	On 2D-31B, observed DC output voltage ~ 130 volts and On 2D-31B, observed AC input voltage ~ 480 volts	N/A SAT UNSAT
(C)	4. (Step 2.4)	Close 2D-31B DC output breaker (B302). **Examiner Cue:** **Describe that DC output breaker B302 indicates closed (up position).**	On 2D-31B, closed B302 DC output breaker.	N/A SAT UNSAT

<u>JOB PERFORMANCE MEASURE</u>

<table>
<tr><th colspan="3">PERFORMANCE CHECKLIST</th><th>STANDARDS</th><th>(Circle One)</th></tr>
<tr><td colspan="5">Procedure Note:
Automatic load sharing should equalize charger load within ≥ 1 minute. However it is not necessary to wait longer if load does not equalize.</td></tr>
<tr><td></td><td>5.
(Step 2.5)</td><td>Wait ≥ 1 minute.
Examiner Note:
The battery chargers will not load share.
<u>Examiner Cue:</u>
If applicant monitors load sharing describe that 2D-31B indicates zero amps and 2D-31A indicates ~115 amps by indicating the approximate readings.</td><td>Monitored time to ensure 1 minute elapsed prior to proceeding.</td><td>N/A SAT UNSAT</td></tr>
<tr><td colspan="5">Procedure Note:
Opening DC output breaker for 2D-31A (B302):
• May cause its DC output voltage to drift to zero and re-flash unit lights to fade. (CR-ANO-2-2003-0423).
• Will cause Bus 2D01 Charger Trouble alarm (2K01-E10).</td></tr>
<tr><td>(C)</td><td>6.
(Step 2.6)</td><td>Open 2D-31A DC output breaker (B302).
<u>Examiner Cue:</u>
Describe that 2D-31A DC output breaker B302 indicates open (down position).</td><td>On 2D-31A, opened B302 DC output breaker.</td><td>N/A SAT UNSAT</td></tr>
<tr><td colspan="5"><u>EXAMINER'S NOTE:</u>
In the following step 2D-31B will not function properly and will required the operator to perform the alternate path to restart 2D-31A.</td></tr>
<tr><td></td><td>7.
(Step 2.7)</td><td>Check 2D-31B picks up load to maintain proper DC bus voltage
of ~ 130 VDC.
<u>Examiner Cue:</u>
Describe that 2D-31B DC output voltage is lowering toward 115 volts and output amps are reading zero by indicating the approximate readings.</td><td>Observes 2D-31B DC output voltage to determine proper operation of 2D-31B.</td><td>N/A SAT UNSAT</td></tr>
</table>

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	8. (Step 2.8)	IF 2D-31A DC output voltage drifted to zero when its DC Output Breaker was opened, THEN perform the following to prove 2D-31A operability: **Examiner Cue:** **Describe that 2D-31A DC output voltage is reading ~ 130 volts by indicating the approximate readings.**	Observes 2D-31A DC output voltage and determines step 2.8 in not applicable.	N/A SAT UNSAT
(C)	9. (Step 2.9)	Open 2D-31A AC Input Breaker (B301). **Examiner Cue:** **Describe that 2D-31A AC input breaker B302 indicates open (down position).**	On 2D-31A, opened B302 DC output breaker.	N/A SAT UNSAT
	10. (Step 2.10)	IF Charger 2D-31B does NOT pick up load, THEN perform the following: **Examiner Cue:** **Describe that 2D-31B DC output voltage is lowering toward 115 volts and output amps are reading zero by indicating the approximate readings.**	Determines that 2D-31B did not pick up load by lowering output voltage and no amps indicated.	N/A SAT UNSAT
	11. (Step 2.10.1)	Refer to Tech Specs 3.8.2.3, 3.8.2.4 and 3.8.3. **Examiner Cue:** **Respond that the SM/CRS will refer to TS 3.8.2.3, 3.8.2.4, and 3.8.3**	Contacts the SM/CRS and reports that 2D-31B did not pick up load and to refer to TS 3.8.2.3, 3.8.2.4, and 3.8.3	N/A SAT UNSAT
(C)	12. (Step 2.10.2)	Open 2D-31B DC output breaker (B302) **Examiner Cue:** **Describe that 2D-31B DC output breaker B302 indicates open (down position).**	On 2D-31B, opened B302 DC output breaker.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	13. (Step 2.10.3)	Open 2D-31B AC input breaker (B301). **Examiner Cue:** **Describe that 2D-31B AC input breaker B301 indicates open (down position).**	On 2D-31B, opened B301 AC input breaker.	N/A SAT UNSAT
	14. (Step 2.10.4)	WHEN ≥ 1 minute elapsed after de-energizing 2D-31A, THEN proceed as follows:	Ensured at least 1 minute has elapsed since 2D-31A AC input breaker was opened.	N/A SAT UNSAT
(C)	15. (Step 2.10.4. A)	Close 2D-31A AC input breaker (B301). **Examiner Cue:** **Describe that 2D-31A AC input breaker B301 indicates closed (up position).**	On 2D-31A, closed B301 AC input breaker.	N/A SAT UNSAT
(C)	16. (Step 2.10.4. B)	Close 2D-31A DC output breaker (B302). **Examiner Cue:** **Describe that 2D-31A DC input breaker B302 indicates closed (up position).**	On 2D-31A, closed B302 DC output breaker.	N/A SAT UNSAT
	17. (Step 2.10.4. C)	Check 2D-31A picks up load to maintain DC bus voltage. **Examiner Cue:** **Describe that 2D-31A DC output voltage is reading ~ 130 volts and output amps are reading ~ 200 by indicating the approximate readings.**	Determined that 2D-31A did pick up load by observing ~ 130V output voltage and 200 amps indicated.	N/A SAT UNSAT
END				

STOP TIME: _______________

EXAMINER'S COPY

INITIAL CONDITIONS:

- Plant is at 100% power.
- 2D-31A Red Train Battery Charger is in service.
- 2D-31B Red Train Battery Charger is secured.
- Preventative Maintenance is scheduled for 2D-31A
- 2107.004 Attachment B-1 initial conditions have been completed (Section 1)

INITIATING CUE:

The SM/CRS directs you to place 2D-31B Battery Charger in service using OP-2107.004 Attachment B-1 beginning with step 2.1.

EXAMINEE'S COPY

INITIAL CONDITIONS:

- Plant is at 100% power.
- 2D-31A Red Train Battery Charger is in service.
- 2D-31B Red Train Battery Charger is secured.
- Preventative Maintenance is scheduled for 2D-31A
- 2107.004 Attachment B-1 initial conditions have been completed (Section 1)

INITIATING CUE:

The SM/CRS directs you to place 2D-31B Battery Charger in service using OP-2107.004 Attachment B-1 beginning with step 2.1.

ATTACHMENT B-1

PARALLEL TRANSFER FROM 2D-31A TO 2D-31B

1.0 INITIAL CONDITIONS

1.1 Verify at least ONE of the following running in 2D-11 Battery Room:

- 2VEF-61
- 2VEF-65
- Temporary Exhaust Fan

CAUTION

Battery Charger cabinets contain both 480 VAC and 125 VDC.

1.2 Refer to 2107.001 Exhibit 9 for applicable Electrical Personal Protection Equipment to access electrical components.

1.3 Verify the following:

- 2D-31B Current Limit Setting Lower/Upper switch (2HS-9110) in UPPER position (located inside 2D-31B cabinet).
- 2D-31B AC input breaker (B301) open.
- 2D-31B DC output breaker (B302) open.
- Auto Transfer switch 2D01-42/2D-31B Battery Charger breaker (2D01-33) closed.
- 2D-31A Battery Charger/Alternate to Auto Transfer Switch 2D01 breaker (2D01-23) closed.
- N/A 2D-31B Disconnect switch (2D01-11) closed. (This is applicable when EC-29145 is installed.)

1.4 <u>IF</u> 2D-31B to be powered from Red Bus,
<u>THEN</u> verify the following:

- 2D-31B Input Transfer switch (2S21) in NORMAL.
- Battery Charger 2D-31B (2B54-G3) closed.

ATTACHMENT B-1

> **NOTE**
>
> This alignment places two battery chargers as loads onto the Emergency Diesel Generator. This is accounted for as shown in ANO-2 DIESEL GENERATOR #1 (2K4A) and #2 (2K4B) LOADING CALC (CALC-85-S-00002-01).

N/A 1.5 IF 2D-31B to be powered from Green Bus,
THEN perform the following:

1.5.1 Verify plant in Mode 5, 6 or defueled.

1.5.2 Declare battery bus 2D01 inoperable.

1.5.3 Refer to Tech Spec 3.8.2.4.

1.5.4 Align 2D-31B to Green Bus IAW “Shifting Battery Charger 2D-31B AC Supply” section of this procedure.

1.6 IF necessary to ensure 2D01 remains energized,
AND Battery 2D-11 available,
THEN verify the following:

- 2D-11 Battery Disconnect (2D-51) closed.
- 2D-41 fuses installed (2K01-D10 “BATTERY 2D11 NOT AVAIL” clear).

1.7 Record on-line charger current load:

- AC amps (A302) 40 amps
- DC amps (A301) 115 amps

2.0 PARALLEL TRANSFER FROM 2D-31A TO 2D-31B

2.1 Close 2D-31B AC input breaker (B301).

> **NOTE**
>
> FLOAT/EQL switch (2HS-9104) is spring return to mid-position switch.

2.2 Verify Green FLOAT indicating light lit on 2D-31B.

2.3 Check the following:

- 2D-31B DC output voltage ~ 130 VDC (V301).
- AC input voltage normal ~ 480 VAC (V302).

2.4 Close 2D-31B DC output breaker (B302).

NOTE

Automatic load sharing should equalize charger load within ≥ 1 minute. However it is not necessary to wait longer if load does not equalize.

2.5 Wait ≥ 1 minute.

NOTE

Opening DC output breaker for 2D-31A (B302):

- May cause its DC output voltage to drift to zero and re-flash unit lights to fade. (CR-ANO-2-2003-0423).
- Will cause Bus 2D01 Charger Trouble alarm (2K01-E10).

CRITICAL STEP

2.6 Open 2D-31A DC output breaker (B302).

2.7 Check 2D-31B picks up load to maintain proper DC bus voltage of ~ 130 VDC.

2.8 IF 2D-31A DC output voltage drifted to zero when its DC Output Breaker was opened, THEN perform the following to prove 2D-31A operability:

2.8.1 Open 2D-31A AC input breaker (B301).

2.8.2 Wait ≥ 1 minute.

2.8.3 Close 2D-31A AC input breaker (B301).

2.8.4 IF 2D-31A DC output voltage did NOT return to ~130 VDC (V301), THEN perform the following:

- Contact Electrical Maintenance for support.
- Initiate WR/WO.
- Initiate Condition Report.

2.9 Open 2D-31A AC Input Breaker (B301).

ATTACHMENT B-1

2.10 IF Charger 2D-31B does NOT pick up load, THEN perform the following:

2.10.1 Refer to Tech Specs 3.8.2.3, 3.8.2.4 and 3.8.3.

2.10.2 Open 2D-31B DC output breaker (B302).

2.10.3 Open 2D-31B AC input breaker (B301).

2.10.4 WHEN ≥ 1 minute elapsed after de-energizing 2D-31A, THEN proceed as follows:

A. Close 2D-31A AC input breaker (B301).

B. Close 2D-31A DC output breaker (B302).

C. Check 2D-31A picks up load to maintain DC bus voltage.

D. Verify all alarms clear.

E. Initiate WR/WO to trouble shoot 2D-31B Charger.

F. Initiate Condition Report.

2.11 Verify all alarms clear on 2K9102 (2D-31B).

2.12 Place Alarm To Control Room Disable/Enable switch on 2D-31B (2HS-9112) in ENABLE.

2.13 Place Alarm To Control Room Disable/Enable switch on 2D-31A (2HS-9113) in DISABLE.

2.14 Verify 2K9102 (2D-31B) lamps operable by performing an annunciator test.

2.15 Verify 2K01-E10 (BATTERY 2D11 NOT AVAIL) clear.

ATTACHMENT B-1

3.0 FINAL CONDITIONS

3.1 WHEN five minutes elapsed,
THEN record the following data:

- 2D-31B AC Amps (A302) ___________
- 2D-31B DC Amps (A301) ___________
- 2D-31B AC Volts (V302) ___________
- 2D-31B DC Volts (V301) ___________

3.2 Check on-coming DC Charger AC amps and DC amps approximately the same as those recorded in Initial Conditions section for off-going DC Charger.

3.3 Notify Control Room to verify EOOS Risk Assessment program and Status Board updated to reflect current DC Charger Power Source Alignment.

Performed by ____ Date ________

Supervisor ____ Date ________

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 003 **DATE:** ______

SYSTEM/DUTY AREA: Condensate and Feedwater System

TASK: Perform Local Actions to start 'D' Condensate pump during a Loss of Feedwater.

JTA#: ANO2-RO-EOPAOP-EMER-28

Alternate Path Yes: ____ No: X **Time Critical** Yes: ____ No: X

KA VALUE RO: 3.0 SRO: 4.2 **KA REFERENCE:** CE E06 EA2.2

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:** ____ **LAB:** ____

POSITION EVALUATED: RO: ____ SRO: ____

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

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 20 Minutes

REFERENCE(S): OP 2202.010, Standard Attachments, Attachment 50 Condensate pump start.

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** ____

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- 2P-7A Outboard Pump Bearing Replacement in-progress.
- The plant has tripped from 100% power due to an inadvertent CSAS.
- Busses 2A1 & 2A3 are locked out due to fire in 2A3 feeder breaker (2A309).

TASK STANDARD:

Established 'D' Condensate pump as a feedwater source to steam generators by performing the following actions:

- Opened DC control power breakers in 2A-106 and 2A-205 to defeat the trip signal.
- Isolated side stream flow path by closing valves 2CS-57 and 2CS-59.
- Opened 'D' condensate pump discharge valve within 3 minutes of pump start.

TASK PERFORMANCE AIDS:

OP 2202.010, Standard Attachments, Attachment 50 Condensate pump start.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs you to perform local actions to start "D" Condensate Pump using OP 2202.010 attachment 50 starting with step 3.

START TIME: ___________________

<table>
<tr><th colspan="3">PERFORMANCE CHECKLIST</th><th>STANDARDS</th><th>(Circle One)</th></tr>
<tr><td colspan="5">TRANSITION NOTE:
Go to elevation 370’ Turbine Building, east of the elevator, to the 2A-1 / 2 Bus area.</td></tr>
<tr><td>(C)</td><td>1.
(Step 3)</td><td>IF MSIS AND CSAS NOT reset, THEN locally open “DC control power” breaker in the following breaker cubicles:
• “CONDENSATE PUMP 2P-2C” 2A106
• “CONDENSATE PUMP 2P-2B” 2A205
Examiner Cue:
When the applicant finds the correct breaker cubicle ask them the general location of the DC control power breaker once they describe it then Show Picture #1. If the applicant wants a closer picture to read the placard Show Picture #2.</td><td>The DC Control Power Breakers located in 2A106 AND 2A205 are positioned down (open).</td><td>N/A SAT UNSAT</td></tr>
<tr><td colspan="5">TRANSITION NOTE:
The applicant may go to elevation 330’ Turbine Building, east of the Main Condenser if checking level locally, use the level gauge above the ‘B’ Condensate pump or contact the control room.</td></tr>
<tr><td></td><td>2.
(Step 4)</td><td>Verify Hotwell level greater than 38%.
Examiner Cue:
Describe that Hotwell level indicates >38% by indicating the approximate reading. (Normal level at power is greater than 38%).</td><td>Hotwell is checked > 38% by contacting a Control Room Operator, checking the local level instrument West of the Main Condenser in the Turbine Building Basement, or the gauge above the ‘B’ Condensate pump.</td><td>N/A SAT UNSAT</td></tr>
</table>

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	3. (Step 5)	Verify the following Recirc valves closed AND Flow Indicating Controllers in MANUAL at 0% demand: • Condensate Pump Recirc 2CV-0662 (2FIC-0662) • Condensate Pump Recirc 2CV-0663 (2FIC-0663) • "A" MFP Recirc 2CV-0741 (2FIC-0735) (R/L then M/A and close) • "B" MFP Recirc 2CV-0749 (2FIC-0742) (R/L then M/A and close) **Examiner Cue:** **Report as a control room operator that all recirc valves listed in the above step are closed with flow indicating controllers in manual at 0% demand.**	2CV-0662, 2CV-0663, 2CV-0741, and 2CV-0749 are checked closed by contacting a Control Room Operator to determine valve position and demand.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

TRANSITION NOTE: Go to elevation 330' Turbine Building, near southwest stairwell to check valve position locally.				
	5. (Step 6 first bullet.)	Locally verify the following valves closed: • "INLET TO 2PCV-4505 ISOL" (2CS-57) **Examiner Cue:** **Describe that 2CS-57 is closed. (stem inserted, resistance felt in the closed direction.)**	Examinee verified closed 2CS-57 by turning handwheel clockwise and noting resistance to motion.	N/A SAT UNSAT
(C)	6. (Step 6 second bullet.)	Locally verify the following valves closed: • "2PCV-4505 BYPASS" (2CS-59) **Examiner Cue:** **Describe that 2CS-59 is closed. (stem inserted, resistance felt in the closed direction.)**	Examinee closed 2CS-59 by turning handwheel clockwise until resistance to motion occurs.	N/A SAT UNSAT
	7. (Step 7)	Locally open selected Condensate Pump Discharge valve 10 turns: • "2P-2D DISCHARGE" (2CS-2D) **Examiner Cue:** **Describe that 2CS-2D is closed. (stem inserted, resistance felt in the closed direction.) Then describe that 2CS-2D is reopened 10 turns. (Normally open valve.)**	Examinee closed 2CS-2D by turning the handwheel clockwise until resistance is felt and then reopened the valve 10 turns by turning the handwheel counter clockwise.	N/A SAT UNSAT
Procedure Caution: Maintaining Condensate pump discharge pressure greater than 753 psig for three minutes or greater will result in pump trip.				
	8. (Step 8)	Start selected Condensate pump. **Examiner Cue:** **Acknowledge communication from the applicant. Then report 2P-2D condensate pump is running and direct the applicant to perform step 9**	Examinee contacted the control room to start 2P-2D condensate pump.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

(C)	9. (Step 9)	Locally open selected Condensate Pump Discharge valve: • "2P-2A DISCHARGE" (2CS-2A) • "2P-2B DISCHARGE" (2CS-2B) • "2P-2C DISCHARGE" (2CS-2C) • "2P-2D DISCHARGE" (2CS-2D) **Examiner Cue:** **Describe that 2CS-2D is open. (stem extended, resistance felt in the open direction.)**	Examinee opened 2CS-2D by turning handwheel counter clockwise	N/A SAT UNSAT
END				

STOP TIME:________________

JOB PERFORMANCE MEASURE

Picture #1

JOB PERFORMANCE MEASURE

Picture #2

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- 2P-7A Outboard Pump Bearing Replacement in-progress.
- The plant has tripped from 100% power due to an inadvertent CSAS.
- Busses 2A1 & 2A3 are locked out due to fire in 2A3 feeder breaker (2A309).

INITIATING CUE:

The SM/CRS directs you to perform local actions to start 2P-2D Condensate Pump using OP 2202.010 attachment 50 starting with step 3.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- 2P-7A Outboard Pump Bearing Replacement in-progress.
- The plant has tripped from 100% power due to an inadvertent CSAS.
- Busses 2A1 & 2A3 are locked out due to fire in 2A3 feeder breaker (2A309).

INITIATING CUE:

The SM/CRS directs you to perform local actions to start 2P-2D Condensate Pump using OP 2202.010 attachment 50 starting with step 3.

ATTACHMENT 50
CONDENSATE PUMP START

N/A 1. IF MSIS NOT reset
AND it is desired,
THEN reset MSIS using 2202.010 Attachment 14, MSIS Reset.

N/A 2. IF CSAS NOT reset
AND it is desired,
THEN reset CSAS by performing the following:

A. Verify CNTMT Spray Termination criteria met:

- CNTMT pressure less than 22.5 psia.
- CNTMT temperature less than 140°F.
- ALL available CNTMT Cooling fans running in Emergency Mode using 2202.010 Exhibit 9, ESFAS Actuation.
- TSC determines CNTMT Spray NOT required for CNTMT Iodine removal.
- CNTMT Spray NOT required for decay heat removal following RAS actuation.

B. Reset CSAS using 2202.010 Attachment 45, CSAS Reset.

3. IF MSIS AND CSAS NOT reset,
THEN locally open "DC CONTROL POWER" breaker in the following breaker cubicles:

- "CONDENSATE PUMP 2P-2C" 2A106
- "CONDENSATE PUMP 2P-2B" 2A205

4. Verify Hotwell level greater than 38%.

5. Verify the following Recirc valves closed
AND Flow Indicating Controllers in MANUAL at 0% demand:

- Condensate Pump Recirc 2CV-0662 (2FIC-0662)
- Condensate Pump Recirc 2CV-0663 (2FIC-0663)
- "A" MFP Recirc 2CV-0741 (2FIC-0735) (R/L then M/A and close)
- "B" MFP Recirc 2CV-0749 (2FIC-0742) (R/L then M/A and close)

ATTACHMENT 50
CONDENSATE PUMP START

6. Locally verify the following valves closed:
   - "INLET TO 2PCV-4505 ISOL" (2CS-57)
   - "2PCV-4505 BYPASS" (2CS-59)
7. Locally open selected Condensate Pump Discharge valve 10 turns:
   - "2P-2A DISCHARGE" (2CS-2A)
   - "2P-2B DISCHARGE" (2CS-2B)
   - "2P-2C DISCHARGE" (2CS-2C)
   - "2P-2D DISCHARGE" (2CS-2D)

CAUTION
Maintaining Condensate pump discharge pressure greater than 753 psig for three minutes or greater will result in pump trip.

8. Start selected Condensate pump.
9. Locally open selected Condensate Pump Discharge valve:
   - "2P-2A DISCHARGE" (2CS-2A)
   - "2P-2B DISCHARGE" (2CS-2B)
   - "2P-2C DISCHARGE" (2CS-2C)
   - "2P-2D DISCHARGE" (2CS-2D)

*10. Throttle Condensate Pump Recirc valves <u>OR</u> MFW Pump Recirc valves to maintain discharge pressure less than 700 psig.

11. Locally position the following valves as desired IAW 2106.016, Condensate and Feedwater Operations.
    - "INLET TO 2PCV-4505 ISOL" (2CS-57)
    - "2PCV-4505 BYPASS" (2CS-59)

Facility: ANO-2 Scenario No.: 1 (New) Op-Test No.: 2015-1

Examiners: ______________ Operators: ______________

Initial Conditions: 100%, 250 EFPD.

Turnover: Red Train Maintenance Week. EOOS indicates 'Minimal Risk'.

Evolution scheduled: Add N2 to 'A' Safety injection tank using 2104.001 section 11. NLO is standing by to align Nitrogen.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP) N (SRO)	Add Nitrogen to 'A' Safety Injection Tank. **OP-2104.001, Safety Injections Tank Operations.**
2	XRCCHAPCNT	I (ATC) I (BOP) I (SRO)	'A' Pressurizer pressure control channel fails low. **OP-2203.028, Pressurizer System Malfunction AOP**
3	K05-H05	C (BOP) C (SRO)	2A-4 Vital 4160 Bus Room cooler belts break. **OP-2203.012E Annunciator 2K05 Corrective Action.**
4	SGATUBE	R (ATC) C (BOP) C (SRO) TS (SRO)	'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min. **OP-2203.038, Primary to Secondary leakage AOP**
5	CEA49STUCK	C (ATC) C (SRO) TS (SRO)	CEA 49 fails to respond to insertion command. **OP-2203.003, CEA Malfunction AOP**
6	SGATUBE	M (All)	'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip **OP-2203.038, Primary to Secondary leakage AOP and OP-2202.001, Standard Post Trip Actions (SPTAs) EOP**
7	FW2PW5AAFT	M (All)	'A' Main Feed water line breaks inside containment. **OP-2202.001, Standard Post Trip Actions (SPTAs) EOP and OP-2202.009, Functional Recovery EOP.**
8	BS2P35AFAL	C (BOP) C (SRO)	Red Train Containment Spray pump fails to auto start. **OP-2202.010 Standard Attachments EOP.**
End point			Post Blowdown RCS temperature and pressure have been controlled and 'A' SG has been isolated.

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

Target Quantitative Attributes (Section D.5.d)	Actual Attributes
Malfunctions after EOP entry (1-2)	1
Abnormal Events (2-4)	4
Major Transients (1-2)	2
EOPs entered requiring substantive actions (1-2)	1
EOP contingencies requiring substantive actions (0-1)	1
Critical Tasks (2-3)	3

Critical Task	Justification	References
Component cooling water to RCPs must be restored within 10 minutes of CIAS or All RCPs must be secured within the next 10 minutes.	Exceeding operating limits has the potential to degrade the RCS pressure boundary. RCPs should be maintained in an available condition for last-resort use if needed. If RCPs are allowed to operate for 10 minutes without CCW flow. OP-1015.050 requires RCPs not meeting operating limits to be secured within 10 minutes.	• 1015.050 Time Critical Operation action program, Attachment C • CE EPGB Simulator CTs: CT-23, Trip any RCP exceeding operating limits (FRG-04) • EOP OP-2202.001 Standard Post Trip Actions. • AOP OP-2203.025 RCP Emergencies.
Stabilize and control RCS temperature after the ESD blowdown terminates. Maintain RCS pressure within the Pressure-Temperature limits of 200°F and 30°F Margin to Saturation throughout implementation of SPTAs and Functional Recovery EOP.	If RCS heatup is allowed after SG blowdown, the RCS could over pressurize and result in lifting PZR and SG safeties. These pressure stresses added to thermal stresses of rapid cooldown could present PTS concerns.	• CE EPGB Simulator CTs: CT-07, Establish RCS temperature Control (SPTA-07, ESDE-05, HR-05)
Isolate 'A' SG (2202.010 Attachment 10 completed) within 1 hour after the Reactor trip. Assumption is that the operator will diagnose within 30 minutes and then isolate within next 30 minutes after entry into 2202.009, Functional Recovery EOP	Isolating the SG will minimize the potential loss of the containment boundary, thus preventing an offsite release and exceeding 10CFR100 exposure limits at the site boundary.	• CE EPGB Simulator CTs: CT-14, Isolate most affected SG (HR-03). • SAR Section 15.1.18 • 1015.050 Time Critical Operation Actions, Attachment C • EOP 2202.009, Functional Recovery Tech Guide

Scenario #1 Objectives

1) Evaluate individual ability to add Nitrogen to Safety Injection Tanks.
2) Evaluate individual response to a failure of the in-service Pressurizer Pressure Channel.
3) Evaluate individual response to a failure of vital electrical room cooler.
4) Evaluate individual response to a Steam Generator Tube leak.
5) Evaluate individual response to a failure of CEAs to respond.
6) Evaluate crew ability to mitigate a Steam Generator Tube Rupture.
7) Evaluate crew ability to mitigate an Excess Steam Demand.
8) Evaluate individual ability to respond to a failure of Green Train Containment Spray to Actuate.
9) Evaluate individual ability to combat events using the Functional Recovery procedure.

SCENARIO #1 NARRATIVE

Simulator session begins with the plant at 100% power steady state.

When the crew has completed their control room walk down and brief, the BOP will add Nitrogen to the ‘A’ Safety Injection Tank.

When the Nitrogen has been added or cued by lead examiner, the ‘A’ pressurizer pressure control channel fails low. This will cause all backup heaters to energize raising RCS pressure and the permissive controller for the SDBCS to calculate the permissive setpoint incorrectly. The RCS pressure rise will cause reactor power to increase. The ATC will report that controlling pressurizer pressure channel has failed low and actual pressure is rising. The SRO will enter the Pressurizer System Malfunction AOP. The SRO will direct the ATC to swap pressurizer pressure control channels and BOP to align the Steam Dump Bypass Control System (SDBCS) for the ‘A’ Pressurizer Pressure control channel failure. [Site OE: CR-ANO-2-2011-1605, Pressurizer pressure failing high, CR-ANO-2-2011-1575, Pressurizer level transmitter failed low due to a reference line failure.]

After the ‘B’ pressurizer pressure control channel has been placed in service and the SDBCS is aligned with one permissive in manual and cued by the lead examiner, 2VUC-2A, 2A-4 Vital 4160V bus room cooler belts will break. This will cause a 2A-4 room cooler trouble alarm in the control room and actual room temperature to rise. The BOP will refer to OP-2203.012E, 2K05 Annunciator Corrective Actions (ACA). The BOP dispatches a NLO to investigate 2VUC-2A. The NLO will report broken belts on 2VUC-2A and the BOP will use the ACA to place 2VUC-2B room cooler in service. [Site OE: CR-ANO-2-2014-1955, Fan belt broken on room cooler]

After the BOP has started the idle vital bus room cooler and cued by lead examiner, a Steam Generator (SG) Tube Leak will occur on ‘A’ Steam Generator. The SRO will enter OP 2203.038, Primary to Secondary Leakage AOP. The SRO will direct the ATC to perform power reduction to take the unit offline. He will also direct the BOP to isolate steam to ‘A’ EFW pump from the ‘A’ steam generator. The SRO should enter TS 3.4.6.2 Action a, RCS leakage, and TS 3.7.1.2 for EFW when steam is isolated to 2P-7A EFW pump. [Industry OE: SOER 83-2, Steam Generator Tube Ruptures.]

During the power reduction CEA 49 will fail to insert. The ATC will notice CEA 49 failed to respond to the insertion command in Manual Group. The crew may attempt to align the CEA in Manual individual but it will not respond. The SRO will enter OP-2203.003, CEA malfunction AOP. The crew will contact I&C to perform CEA traces and the SRO should enter TS 3.1.3.1 b due to immovable but aligned CEA. I&C will report a Control Element Drive System problem that can be fixed. The ATC should use group P CEA to control ASI until CEA 49 is repaired. [Site OE: CR-ANO-2-2007-0128, CEA 49 fails to respond to insertion commands]

SCENARIO #1 NARRATIVE (continued)

After the crew has completed the required reactivity manipulation, entered the appropriate tech specs, and cued by the lead examiner, The Steam Generator Tube leak will get larger. The CRS will perform the continuous action step in Primary to Secondary Leakage AOP to trip the reactor, actuate Safety Injection Actuation Signal (SIAS), actuate Containment Cooling Actuation Signal (CCAS), and go to Standard Post Trip Actions (SPTAs). [Industry OE: SOER 83-2, Steam Generator Tube Ruptures. Steam Generator Tube Rupture response is a time critical operator action per OP-1015.050 Time Critical Operator action program.]

The crew will implement OP-2202.001, Standard Post Trip Actions (SPTA) EOP. The crew will assess safety functions. After the reactor trips a Main Feedwater line break (‘A’ SG due to pressure surge from reactor trip causing the feedwater check valve cap to leak) inside containment will cause an Excess Steam Demand. Main Steam Isolation (MSIS) and Containment Spray (CSAS) will actuate tripping Main Feedwater pumps, Condensate pumps, AFW pump, closing the MSIVs and feedwater block valves. The crew should recognize that red train Containment Spray pump failed to start. The crew should send a NLO to the breaker and to the pump. After, the NLOs report no issues the BOP should start the red train spray pump 2P-35A. Containment Isolation Action Signal (CIAS) will occur causing a loss of Component Cooling Water (CCW) to the Reactor Coolant Pumps (RCPs) the crew will secure RCPs due to the loss of CCW flow causing natural circulation of the RCS. [Industry OE for Excess Steam Demand, SOER 82-7, Reactor Vessel Pressurized Thermal Shock. CR-ANO-2-2009-375, 2P-35A Spray pump failed to respond to handswitch. CR-ANO-2-2006-0848, Component failed to respond to SIAS signal. PRA item # 5 Trip RCPs after loss of CCW in order to avert RCP seal LOCA.]

After completing SPTAs, The SRO will diagnose Excess Steam Demand and Steam Generator Tube Rupture events and enter OP-2202.009, Functional Recovery EOP. The crew will maintain post blowdown temperature and pressure of the RCS to prevent pressurized thermal shock. The BOP will steam ‘B’ SG using the upstream Atmospheric Dump valve when ‘A’ SG blows dry. The ATC should use Auxiliary Spray to maintain RCS pressure. The Crew will isolate the ‘A’ SG using OP-2202.010 Standard Attachment 10.

Simulator Instructions for Scenario 1

Reset Simulator to appropriate IC.

‘A’ channel pressurizer pressure and level controllers are in service.

T1, T2, T3, & T4, set to false.

T4 on Reactor Trip.

Event No.	Malf. No.	Value/ Ramp Time	Event Description
1			Add Nitrogen to ‘A’ Safety Injection Tank. **OP-2104.001, Safety Injections Tank Operations.**
2	XRCCHAPCNT **Trigger 1**	0	‘A’ Pressurizer pressure control channel fails low. **OP-2203.028, Pressurizer System Malfunction AOP**
3	K05-H05 **Trigger 2**	active	Vital Electrical 4160 Bus Room cooler belts break. **OP-2203.012E Annunciator 2K05 Corrective Action.**
4	SGATUBE **Trigger 3**	12 gpm / 5 min.	‘A’ Steam Generator Tube leak ramps up to 12 gpm over 5 min. **OP-2203.038, Primary to Secondary leakage AOP**
5	CEA49STUCK	0	CEA 49 fails to respond to insertion command. **OP-2203.003, CEA Malfunction AOP**
6	SGATUBE	100 / 5 min.	‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip **OP-2203.038, Primary to Secondary leakage AOP and OP-2202.001, Standard Post Trip Actions (SPTAs) EOP**
7	FW2PW5AAFT **Trigger 4**	6000 gpm/ 5 min. Delay = 30 sec.	‘A’ Main Feed water line breaks inside containment. **OP-2202.001, Standard Post Trip Actions (SPTAs) EOP and OP-2202.009, Functional Recovery EOP.**
8	BS2P35AFAL	active	Red Train Containment Spray pump fails to auto start. **OP-2202.010 Standard Attachments EOP.**

Simulator Operator CUEs		
At T=0		Add Nitrogen to 'A' Safety Injection Tank.
Cue: When Contacted as NLO to align N2, then report that high pressure Nitrogen has been aligned IAW Exhibit 7. **Cue: When Contacted as NLO to align N2, then report that high pressure Nitrogen has been secured IAW Exhibit 7.**		
Cued by lead examiner	Trigger T1	'B' Pressurizer pressure control channel fails low.
Cue: If contacted as work management, state that you will contact I&C to investigate the failure.		
Cued by lead examiner	Trigger T2	Vital Electrical 4160 Bus Room cooler belts break.
Cue: When requested to investigate 2VUC-2A, wait one minute and then report that the belts are broken on 2VUC-2A. Fan suction is not obstructed, Fan filters are clean and Drip pan is not clogged. **Cue: If requested as work management, report that a planner will begin planning work to replace the belts.** **Booth Operator Note: When 2VUC-2A is stopped return K05-H05 to normal.**		
Cued by lead examiner	Trigger T3	'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min.
Cue: When contacted as Chemistry, respond that you will implement 2602.001 Primary to Secondary leakage. **Cue: If contacted as the above people, acknowledge the information concerning the power reduction.** **Cue: If contacted as a NLO and/or chemistry, report that you will secure Zinc injection and monitor secondary chemistry.** **Cue: If contacted as chemistry, report that you will obtain an RCS sample for Iodine at the time requested.**		
Cued by lead examiner	Trigger T4	CEA 49 fails to respond to insertion command.
Cue: When contacted as the work management or I&C to troubleshoot, wait 5 minutes and then call and report that you are going to commence troubleshooting. Ask the control room to insert CEA 49 for traces. **Cue: After CEA 49 insertion is attempted, wait one minute then report that CEA 49 is not inserting due to a failed hall effect transducer and it will have to be replaced.**		
Cued by lead examiner		'A' Steam Generator Tube leak ramps up from 2 gpm to 100 gpm over 5 min causes Reactor Trip
Cue: If contacted as the STA to report to the control room, acknowledge the request. **Cue: If contacted as a NLO to perform Attachment 47 Field Operator Post Trip Actions, acknowledge request.** **Cue: When contacted as Chemistry, then report you will sample 'A' S/G for activity and Monitor RDACS for off site dose releases.** **Cue: If contacted to remove the danger tags and close the LTOP breakers, then wait 2 minutes and use the remote function for 2B51-E4 and 2B51-K2 to close the breakers and inform the control room that 2B51-E4 and 2B51-K2 are closed.**		

		Red Train Containment Spray pump fails to auto start.
Cue: If contacted as NLO to investigate 2P-35A spray pump and breaker, then after ~ 1 min. report the breaker is open and looks normal locally. After ~ 2 min. report that 2P-35A motor and pump look normal locally.		

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 1
Event Description: Add Nitrogen to ‘A’ Safety Injection Tank.		

Time	Position	Applicant's Actions or Behavior
Procedure Note: If raising SIT level or pressure prior to/or during plant heatup, then SIT levels should be high and pressures low in operability band to ensure low level, high pressure condition will not be created when SITs heatup.		
	BOP	11.1 Verify HP Nitrogen Supply aligned with N2 regulator set at desired pressure using N2 System Operations (2104.009), Exhibit 7, Nitrogen Manifold Operations.
Cue: When Contacted as NLO to align N2, report that high pressure Nitrogen has been aligned IAW Exhibit 7.		
	BOP	11.2 Open Supply Header to Containment Isolation 2CV-6207-2 (2HS-6207-2).
Procedure Caution: Cross-connecting SITs via nitrogen supply valves in Modes 1, 2 and 3 (with RCS pressure greater than or equal to 700 psia) will cause associated SITs to be inoperable.		
Examiner Note: The TS band for SIT pressure is 600 to 624 psig. The low pressure alarm is 606 psig and the high pressure alarm is 618 psig.		
	BOP	11.3 IF desired to raise pressure in SIT (2T-2A), THEN perform the following: 11.3.1 Open N2 Supply valves 2SV-5005A/B (2HS-5005). 11.3.2 WHEN 2T-2A at desired pressure, THEN close N2 Supply valves 2SV-5005A/B (2HS-5005).
	BOP	11.7 Close Supply Header to Containment Isolation 2CV-6207-2 (2HS-6207-2).
	BOP	11.8 Verify HP N2 from Unit 1 secured IAW N2 System Operations (2104.009), Exhibit 7, Nitrogen Manifold Operations.
Cue: When Contacted as NLO to align N2, report that high pressure Nitrogen has been secured IAW Exhibit 7.		
Termination criteria: When Nitrogen has been added to the SIT or at the discretion of the lead examiner.		

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 2
Event Description: ‘A’ Pressurizer pressure control channel fails low.		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ATC	Announce alarm 2K10-E6, CNTRL CH 1 PRESSURE HI/LO and ‘B’ Channel Pressure is reading low and actual pressure is rising.
	SRO	Implement OP-2203.028 PZR Systems Malfunction AOP.
	SRO	1. Check the following criteria: D. Check "CNTRL CH 1/2 PRESSURE HI/LO" annunciators (2K10-E6/E7) clear. **Examiners Note: Step D is not met, perform contingency**
	SRO	D. GO TO Step 6.
	SRO	6. Check "CNTRL CH 1/2 PRESSURE HI/LO" annunciators (2K10-E6/E7) clear. **Examiners Note: Step 6 is not met, perform contingency**
	ATC	6. Perform the following: A. Compare PZR pressure instruments to determine affected channel.
	SRO	B. <u>IF</u> BOTH PZR Pressure Control channels failed, <u>THEN</u> perform the following: 1) Manually control PZR Heaters and Spray Valves to restore RCS pressure 2025 psia to 2275 psia. 2) Place the SDBCS in required contingency alignment using Attachment A, SDBCS Operations. **Examiners Note: Step 6.B is N/A.**
	ATC	C. IF only the selected control channel affected, THEN perform the following: 1) Place PZR Pressure Channel Select switch (2HS-4626) to the unaffected channel.
Procedure Note: Proportional Heater controller is located on Page 3.		
	ATC	2) Restore PZR Spray valves and Heater control to automatic.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 2
Event Description: 'A' Pressurizer pressure control channel fails low.		

Time	Position	Applicant's Actions or Behavior
	SRO	SRO directs the BOP to perform Attachment A for the channel 1 failure. D. IF Pressure Control Channel 1 failed, THEN place the SDBCS in required contingency alignment using Attachment A, of this procedure. E. IF Pressure Control Channel 2 failed, THEN place the SDBCS in required contingency alignment using Attachment A, of this procedure. **Examiners Note: Step 6.E is N/A.**
	BOP	Implement Attachment A steps for the channel 2 failure.
Procedure Note: Failure of PZR Pressure Control Channel 1 will result in SDBCS Main calculator producing an incorrect setpoint.		
Att. A	BOP	1. IF PZR Pressure Control Channel 1 failed, THEN perform the following: A. Place SDBCS Master controller (2PIC-0300) in Auto Local. B. Adjust setpoint to 1010 psia.
Cue: If contacted as work management, state that you will contact I&C to investigate the failure.		
Termination Criteria: When the Pressurizer Pressure Channels have been swapped and Attachment A actions are complete or at discretion of lead examiner.		

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 3
Event Description: Vital Electrical 4160V bus room cooler belts break.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Announce annunciator 2K05-H5, 2VUC-2A/B TROUBLE/TEMP HI.
	BOP/SRO	Implement ACA 2203.012E Annunciator 2K05 Corrective Action.
	BOP/SRO	1.0 CAUSES 1.1 Discharge air temperature on EITHER of the following Coolers greater than 130°F: • 2A-4 Room Cooler 2VUC-2A (2TIS-8654-2A) • 2A-4 Room Cooler 2VUC-2B (2TIS-8654-2B) 1.2 Air flow on EITHER of the following Coolers less than 3000 cfm 20 seconds after start: • 2VUC-2A (2FS-8654-2A) • 2VUC-2B (2FS-8654-2B) 1.3 2VUC-2A drip pan level (2LS-8654-2A) greater than 1 inch. 1.4 2VUC-2B drip pan level (2LS-8654-2B) greater than 1 inch.
	BOP	2.0 ACTION REQUIRED 2.1 Determine affected Room cooler: • 2VUC-2A • 2VUC-2B 2.2 Verify Room coolers running as required: • 2VUC-2A (2HS-8652-2) • 2VUC-2B (2HS-8654-2) Examiner Note: Normally on one room cooler is running.
	BOP	2.3 Verify SW Inlet open for running fan(s): • 2VUC-2A SW Inlet 2CV-1486-2 (2HS-1486-2) • 2VUC-2B SW Inlet 2CV-1487-2 (2HS-1487-2)

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 3
Event Description: Vital Electrical 4160V bus room cooler belts break.		

Time	Position	Applicant's Actions or Behavior
	BOP	The BOP should dispatch a NLO to investigate 2VUC-2A including the following items: 2.4 Check the following: • Fan suction unobstructed • Fan filters clean • Drip pan drains unclogged
Cue: When requested to investigate 2VUC-2A, wait one minute and then report that the belts are broken on 2VUC-2A. Fan suction is not obstructed, Fan filters are clean and Drip pan is not clogged. **Cue: If requested as work management, report that a planner will begin planning work to replace the belts.**		
	BOP/SRO	2.5 IF deficiencies noted, THEN verify WR/WO submitted. **Examiner Note: This may be performed later or they may contact work management to perform this action.**
	BOP	2.6 IF necessary to swap fans, THEN perform the following: 2.6.1 IF 2VUC-2A is the affected fan, THEN perform the following: A. Start 2VUC-2B (2HS-8654-2). B. Verify 2VUC-2B SW Inlet (2CV-1487-2) opens.
Booth Operator Note: When 2VUC-2A is stopped return K05-H05 to normal.		
	BOP	C. Stop 2VUC-2A (2HS-8652-2). D. Close 2VUC-2A SW Inlet 2CV-1486-2 (2HS-1486-2).
Termination criteria: When 2VUC-2B has been placed in service or at lead examiner's discretion.		

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: 'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Announce alarm 2K11-A10 SEC SYS RADIATION HI.
	SRO	Enter OP-2203.038, Primary to Secondary leakage AOP.
	SRO	1. Open Placekeeping page. 2. Notify Control Board Operators to monitor floating steps.
Procedure Note: N-16 monitors only calculate SG leak rates with plant power (CV-9000) greater than 20%.		
	ANY	*3. 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.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: 'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
	ANY	4. 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.
	ATC	*5. Control Charging and Letdown to maintain PZR level within 5% of setpoint.
	ANY	■6. Check BOTH of the following are true: • RCS leakage LESS than 44 gpm • PZR level maintained within 10% of setpoint **Examiner Note: The conditions of step 6 will be true when the first time the crew completes the step however they will become not true later in the event and the SRO will transition to the contingency column.**
	ANY	7. Notify Chemistry to implement 2602.001, Primary to Secondary Leakage.
Cue: When contacted as Chemistry, respond that you will implement 2602.001 Primary to Secondary leakage.		

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 4

Event Description: 'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min.

Time	Position	Applicant's Actions or Behavior

Procedure Note:

- Leakage (including leakage spike) is confirmed if TWO independent radiation monitors trending upward.
- The probability of locating a tube leak after plant shutdown with leakrates less than 50 gpd (.035 gpm) is low.

SRO

8. WHEN confirmed primary to secondary leakrate determined, THEN perform the applicable action per the table below:

Parameter	Value	Action
ANY SG OR TOTAL (BOTH SGs)	≥ 44 gpm	**GO TO** Step 6.
ANY SG	> 100 gpd (> 0.069 gpm)	Perform ACTION LEVEL THREE section of Attachment A while continuing with this procedure.
ANY SG	≥ 75 gpd (0.052 gpm)	Perform ACTION LEVEL TWO section of Attachment A while continuing with this procedure.
ANY SG	≥ 30 gpd (.021 gpm)	Perform ACTION LEVEL ONE section of Attachment A while continuing with this procedure.
TOTAL (both SGs)	≥ 5 gpd (.0035 gpm)	Perform RAISED MONITORING section of Attachment A while continuing with this procedure.
TOTAL (both SGs)	< 5 gpd (.0035 gpm)	Perform ACTION PLAN of Attachment A while continuing with this procedure.

Examiner Note: SRO may perform step 9 which is a floating step then transition to Attachment A.

ANY

■9. IF plant shutdown required, THEN isolate EFW pump 2P7A Steam supply as follows:

A. Close Main Steam Supply valve to 2P7A from leaking SG:
- SG "A" TO EMER FW PUMP TURBINE (2CV-1000-1)
- SG "B" TO EMER FW PUMP TURBINE 2CV-1050-2

B. Refer to TS 3.7.1.2, Emergency Feedwater System.

Examiner Note: The SRO must enter TS 3.7.1.2.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: ‘A’ Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
Examiner Note: Several procedures may be performed in parallel the following are the location in the exam. Attachment A of the Primary to Secondary AOP is on this page. The Rapid Power Reduction AOP starts on page 17 and then continues after the boration steps on page 20. The Power Operations procedure starts on page 22. The steps for boration are on pages 17 -20. The continuation of the primary secondary AOP is on page 29.		
	SRO	The SRO will transition to Action Level Three of Attachment A.
Action level three	SRO	1. ACTION LEVEL THREE (> 100 gpd) A. Record current time: ____________ *B. IF ANY SG leakrate rises to ≥44 gpm THEN GO TO Step 6 in the body of this procedure. **Examiner Note: This step is not currently applicable but will become applicable when the leakrate rises.**
	ATC/SRO	C. IF at power, THEN perform the following: 1) Refer to applicable reactivity plan.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: 'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
	SRO	2) Perform the following using 2102.004, Power Operations OR 2203.053, Rapid Power Reduction as necessary to be < 50% power within one hour of time recorded above, AND in Mode 3 in the following two hours: *****a) IF RCS leakage greater than or equal to 10 gpm, THEN perform RCS boration using2104.003, Chemical Addition, Attachment R, RCS Boration From theRWT OR BAMT. b) IF leakage less than 10 gpm, THEN perform EITHER of the following: • RCS boration using 2104.003, Chemical Addition, Attachment R, RCS Boration from the RWT or BAMT. • RCS boration using 2104.003, Chemical Addition, Exhibit 3, Normal RCS Boration at Power. **Examiner Note: The SRO will direct a power reduction using either power operations procedure or Rapid Power Reduction AOP.**
	SRO	The SRO will transition to OP-2203.053 Rapid Power Reduction AOP or OP-2102.004 Power Operations emergent power reduction section. **Examiner Note: Power operations procedure steps start on page 21.**
OP-2203.053Rapid Power Reduction AOP		
Procedure Note: • Use of this procedure may be terminated at any point if a complete shutdown is not required. • Shutdown rate shall be based on plant conditions and safety considerations. Rate may be raised or lowered as plant conditions warrant.		
Rapid Power Reduction AOP	ANY	*1. IF at any time, it is determined that significant manual actions are required to EITHER maintain the plant online, OR maintain the desired maneuvering rate, THEN perform the following: A. Trip the Reactor. B. GO TO 2202.001, Standard Post Trip Actions.
	Procedure Note: If Emergency Boration in progress, changing the number of running Charging pumps will change boration rate.	
	ATC	2. Commence Power reduction using appropriate reactivity plan.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: 'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
	ATC	The ATC will transition to OP-2104.003, Chemical Addition, Attachment R to commence boration.
Procedure Caution: • Do NOT use BAMT and RWT as boration sources at same time. • Additional CCP starts while aligned to RWT or BAMT suction will result in more boration. • With VCT isolated (Outlet closed and divert flow aligned to BMS), CBO flow will result in VCT level rise with no control process in place to limit level rise. (CR-ANO-2-2009-01786)		
Procedure Caution: The following section has been determined to have a Reactivity Addition Potential (RAP) and this activity is classified as a Risk Level R2.		
Procedure Note: For an Unplanned Reactivity Manipulation, the required controls for planned reactivity evolutions are not applicable during AOP (including ACA response) or EOP conditions IAW COPD-030.		
2104.003 Att. R boration steps.	ANY	1.0 <u>IF</u> a Reactivity Management Brief has NOT been conducted, <u>THEN</u> perform a Reactivity Management Brief per COPD-030 with an SRO. **Examiner Note: This step in N/A when an AOP has been entered.**
	ATC	2.0 Determine desired boration rate, dilution flow, and number of required charging pumps from Reactivity Plans located in Plant Data Book or by manual calculation. **Examiner Note: During the first 15 minutes of the power reduction the crew will run 2 charging pumps with suction from the RWT. They will dilute at ~14 gpm and insert group 6 CEA's 6" for ASI control**
	ATC	3.0 Verify Blending Tee aligned to CCP Suction.
Procedure Note: Placing VCT Inlet/Divert valve 2CV-4826 in BMS position will change RCS leakage indications.		
2104.003 Att. R boration steps.	ATC	4.0 <u>IF</u> VCT level greater than 62 percent, <u>THEN</u> place 2HS-4826 (VCT Inlet/Divert valve 2CV-4826) to BMS position. 5.0 <u>IF</u> desired, <u>THEN</u> record initial controller data: 2FIC-4926 Setpoint: ___________ Demand: _____________ 2FIC-4927 Setpoint: ___________ Demand:_____________

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: ‘A’ Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
2104.003 Att. R boration steps.	ATC	6.0 Perform the following to align for dilution: 6.1 Verify the following on Boric Acid MU Flow controller (2FIC-4926): • In MANUAL • Demand set to MINIMUM 6.2 Verify EITHER Reactor Makeup pump running: • 2P-109A (2HS-4965) • 2P-109B (2HS-4966) 6.3 Verify Reactor Makeup Water Flow controller (2FIC-4927) set as follows: 6.3.1 Setpoint set to desired flow rate. 6.3.2 IF in MANUAL,THEN demand set to desired value. 6.4 Open VCT Makeup Isolation (2CV-4941-2) (2HS-4941-2). 7.0 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)
	ATC	8.0 Close VCT Outlet (2CV-4873-1) (2HS-4873-1). **Examiner Note: Step 8 starts the down power.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: ‘A’ Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
2104.003 Att. R boration steps.	ATC	9.0 Verify VCT Inlet/ Divert valve 2CV-4826 (2HS-4826) in BMS position. *10.0 Perform the following to Start/Stop additional Charging pumps: 10.1 <u>IF</u> desired to raise flow, <u>THEN</u> perform the following: A. Start additional charging pumps as necessary. B. Adjust Reactor Makeup Water flow as necessary to maintain desired shutdown rate (2FIC-4927). 10.2 <u>IF</u> desired to lower flow, <u>THEN</u> perform the following: A. Adjust Reactor Makeup Water flow as necessary to maintain desired shutdown rate (2FIC-4927). B. Secure additional Charging Pumps as necessary.
	ATC	11.0 Perform the following to initiate dilution flow: 11.1 Place Mode Select switch (2HS-4928) in MANUAL. 11.2 Verify Boric Acid MU Flow controller (2FIC-4926) indicates zero. *11.3 Verify Reactor Makeup Water Flow controller (2FIC-4927) indicates desired flow rate. 11.4 Verify BAM Tank Recirc valve open for running pump: • 2T-6A recirc (2HS-4903-2) • 2T-6B recirc (2HS-4915-2)
	SRO	The SRO will continue to OP-2203.053, Rapid Power reduction AOP.
Procedure Note: The CBOT is the preferred RO to lower turbine load so that the ATC can focus on primary plant control. However, either individual can operate the turbine as plant conditions dictate.		
	BOP	*3. Lower Turbine load as necessary to hold Tave within ± 3°F of program Tref.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4

Event Description: ‘A’ Steam Generator Tube leak ramps up to 12 gpm over 5 min.

Time	Position	Applicant's Actions or Behavior
		Procedure Note: • CEAs should not be inserted below 80 inches withdrawn when the Reactor is at power and the CPC Aux trip is active. ASI would tend to shift back to the top of the core if CEAs are inserted more than halfway. • At higher power levels, larger (more aggressive) CEA insertions may be required (6 to 8 inches recommended initially). • ASI response to power changes at the end of core life is more severe, at times significantly so. The effects of ASI may not be seen until well into the power change. • Proactively driving ASI more positive than ESI (up to +0.05 deviation) will improve the ability to control ASI at lower power levels. • Exceeding COLR ASI limit will challenge CPC QASI Aux Trip setpoint and may result in automatic trip. CPC QASI Aux Trip occurs at ±0.45 (PID 187).
	ATC	*4. Perform the following for ASI: • Maintain ASI within Core Operating Limits Report (COLR) limits using CEA Group 6 or Group P. • Use ONE of the following to monitor ASI closely: - COLSS (CV9198) - IF COLSS inoperable, THEN use CPC channel ASI (PID 268) that most closely agreed with COLSS when it was operable. • Periodically monitor QASI (PID 187). • Insert Group 6 (preferred at higher power) OR Group P CEAS (preferred at lower power) using Exhibit 3 of 2105.009, CEDM Control System Operation, as necessary.
	BOP	*5 IF desired to transfer unit auxiliaries from Unit Aux transformer to SU #3, THEN perform Attachment A, Transferring Loads to SU #3.
	BOP	*6 Throttle Condensate recircs as necessary to maintain 650-750 psig Condensate Pump Discharge pressure: • 2CV-0662 (2FIC-0662) • 2CV-0663 (2FIC-0663)
	ANY	7. Perform notifications of power reduction using Attachment B, Notifications.

<table>
<tr><td colspan="3">Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 4

Event Description: ‘A’ Steam Generator Tube leak ramps up to 12 gpm over 5 min.</td></tr>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>ANY</td><td>*8. Monitor Secondary chemistry and adjust chemical feed as needed using 2106.028, Secondary System Chemical Addition.</td></tr>
<tr><td></td><td>ANY</td><td>9. WHEN at ~ 80% power,
THEN perform the following:

A. Initiate action to perform channel calibration within 24 hours of last
successful channel check (OPS-B6).

B. IF MSR Stage 2 Hi Load valves (2CV-0404/0464) have NOT closed automatically,
THEN verify the following valves closed (2HS-0404):
• 2CV-0404
• 2CV-0464</td></tr>
<tr><td colspan="3">Examiner Note: OP-22013.038 Primary to Secondary Leakage AOP steps are continued on Page 29.</td></tr>
<tr><td colspan="3">OP-2102.004 Power Operations emergent power reduction section.</td></tr>
<tr><td colspan="3">Procedure Caution:
The following section has been determined to have a Reactivity Addition Potential (RAP) and this activity is classified as a Risk Level R1.
For an Unplanned Reactivity Manipulation, the required controls for planned reactivity evolutions are not applicable during AOP (including ACA response) or EOP conditions IAW COPD-030.</td></tr>
<tr><td>Power Operation power reduction.</td><td>SRO</td><td>12.1 IF time allows
AND Reactivity Management Brief has NOT been conducted,
THEN perform a Reactivity Management Brief per COPD-030 with an SRO.

Examiner Note: Formal Reactivity Brief is not required per COPD-030 due to AOP implementation, however a transient reactivity brief should be conducted IAW transient standards and may take place after the power reduction has started.</td></tr>
<tr><td rowspan="2">Power Operation power reduction.</td><td colspan="2">Procedure Note:
• Plant parameters may be monitored using Exhibit 2, Various Parameters Vs Reactor Power.
• Boron adjustment data for power change may be obtained from Reactivity curves located in Plant Data book.</td></tr>
<tr><td>SRO</td><td>12.2 IF plant must be off-line within one hour,
THEN refer to Attachment H, Rapid Power Reduction.</td></tr>
</table>

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: 'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
	Procedure Note: • Initially, only enough boric acid should be added to reduce power by a few percent (less than 5%). As power lowers, Xenon will start to peak causing power to drop faster. Dilution may be required to slow power reduction rate. • If one BAM Tank is out of service for Acid Reducing Chemistry, depletion of on-line BAMT during power reduction may result in TRM 3.1.8 entry.	
	ATC	12.3 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. • Boration from RWT or BAMT using Chemical Addition (2104.003), Attachment R, RCS Boration From The RWT or BAMT. • CEA insertion using CEDMCS Control System Operation (2105.009), Exhibit 3 CEDMCS Operations (normally for ASI control). **Examiner's Note: The ATC will commence power reduction using 2104.003, Attachment R, due to the SGTR being 12 gpm.**
	ATC	The ATC will transition to OP-2104.003, Chemical Addition, Attachment R to commence boration.
Procedure Caution: • Do NOT use BAMT and RWT as boration sources at same time. • Additional CCP starts while aligned to RWT or BAMT suction will result in more boration. • With VCT isolated (Outlet closed and divert flow aligned to BMS), CBO flow will result in VCT level rise with no control process in place to limit level rise. (CR-ANO-2-2009-01786)		
Procedure Caution: The following section has been determined to have a Reactivity Addition Potential (RAP) and this activity is classified as a Risk Level R2.		
Procedure Note: For an Unplanned Reactivity Manipulation, the required controls for planned reactivity evolutions are not applicable during AOP (including ACA response) or EOP conditions IAW COPD-030.		
2104.003 Att. R boration steps.	ANY	1.0 <u>IF</u> a Reactivity Management Brief has NOT been conducted, <u>THEN</u> perform a Reactivity Management Brief per COPD-030 with an SRO. **Examiner Note: This step in N/A when an AOP has been entered.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: 'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
2104.003 Att. R boration steps.	ATC	2.0 Determine desired boration rate, dilution flow, and number of required charging pumps from Reactivity Plans located in Plant Data Book or by manual calculation. **Examiner Note: During the first 15 minutes of the power reduction the crew will run 2 charging pumps with suction from the RWT. They will dilute at ~14 gpm and insert group 6 CEA's 6" for ASI control**
	ATC	3.0 Verify Blending Tee aligned to CCP Suction.
Procedure Note: Placing VCT Inlet/Divert valve 2CV-4826 in BMS position will change RCS leakage indications.		
2104.003 Att. R boration steps.	ATC	4.0 IF VCT level greater than 62 percent, THEN place 2HS-4826 (VCT Inlet/Divert valve 2CV-4826) to BMS position. 5.0 IF desired, THEN record initial controller data: 2FIC-4926 Setpoint: ___________ Demand: _____________ 2FIC-4927 Setpoint: ___________ Demand:_____________

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: ‘A’ Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
2104.003 Att. R boration steps.	ATC	6.0 Perform the following to align for dilution: 6.1 Verify the following on Boric Acid MU Flow controller (2FIC-4926): • In MANUAL • Demand set to MINIMUM 6.2 Verify EITHER Reactor Makeup pump running: • 2P-109A (2HS-4965) • 2P-109B (2HS-4966) 6.3 Verify Reactor Makeup Water Flow controller (2FIC-4927) set as follows: 6.3.1 Setpoint set to desired flow rate. 6.3.2 IF in MANUAL,THEN demand set to desired value. 6.4 Open VCT Makeup Isolation (2CV-4941-2) (2HS-4941-2). 7.0 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)
	ATC	8.0 Close VCT Outlet (2CV-4873-1) (2HS-4873-1). **Examiner Note: Step 8 starts the down power.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: ‘A’ Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
2104.003 Att. R boration steps.	ATC	9.0 Verify VCT Inlet/ Divert valve 2CV-4826 (2HS-4826) in BMS position. *10.0 Perform the following to Start/Stop additional Charging pumps: 10.1 IF desired to raise flow, THEN perform the following: A. Start additional charging pumps as necessary. B. Adjust Reactor Makeup Water flow as necessary to maintain desired shutdown rate (2FIC-4927). 10.2 IF desired to lower flow, THEN perform the following: A. Adjust Reactor Makeup Water flow as necessary to maintain desired shutdown rate (2FIC-4927). B. Secure additional Charging Pumps as necessary.
	ATC	11.0 Perform the following to initiate dilution flow: 11.1 Place Mode Select switch (2HS-4928) in MANUAL. 11.2 Verify Boric Acid MU Flow controller (2FIC-4926) indicates zero. *11.3 Verify Reactor Makeup Water Flow controller (2FIC-4927) indicates desired flow rate. 11.4 Verify BAM Tank Recirc valve open for running pump: • 2T-6A recirc (2HS-4903-2) • 2T-6B recirc (2HS-4915-2)
	SRO	The SRO will continue to OP-2102.004, Power Operations emergent power reduction.
2102.004 Power Operations	BOP	12.4 Lower Turbine load as necessary to hold Tave within ± 2°F of program Tref using Exhibit 1, TAVE VS TREF. 12.4.1 IF desired to stop Turbine load OR Power reduction, THEN perform the following as necessary: A. Secure RCS Boration using Chemical Addition (2104.003). B. Commence RCS dilution using Chemical Addition (2104.003).

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4

Event Description: 'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td rowspan="2">2102.004
Power
Operations</td><td>ANY</td><td>*12.5 IF any Group 6 or P CEA RSPT inoperable due to spiking, T-Mod, etc.,
THEN refer to CPC/CEAC Operations (2105.001) to perform the following as required:

• IF Group 6 or P must be inserted below 138.58 inches
AND all inoperable RSPTs in group input to same CEAC,
THEN place affected CEAC in INOP in all operable CPCs.
• IF Group 6 or P must be inserted below 138.58 inches
AND inoperable RSPTs in group input to BOTH CEACs,
THEN perform the following:

- Place BOTH CEACs in INOP in ALL operable CPCs
- Restrict usage to Group 6 in accordance with TS 3.1.3.6.

• IF Group 6 or P insertion required due to a transient condition before CEACs can be placed in INOP,
THEN declare affected CEACs inoperable when group inserted below 138.58 inches.</td></tr>
<tr><td>SRO</td><td>12.6 IF plant shutdown/power reduction 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.</td></tr>
<tr><td colspan="3">Procedure Note:
• CEAs should not be inserted below 80 inches withdrawn when the Reactor is at power and the CPC Aux trip is active. ASI would tend to shift back to the top of the core if CEAs are inserted more than halfway.
• ASI response to power changes at the end of core life is more severe, at times significantly so. The effects of ASI may not be seen until well into the power change.
• QASI (PID 187) provides the CPC Aux Trip function (trip setpoint ± 0.45).
• The Reactivity Plan provides information on CEA positioning to minimize the undesired ASI response.</td></tr>
<tr><td></td><td>ATC</td><td>*12.7 Perform the following for ASI:
• Maintain ASI (PID 268) within Core Operating Limits Report (COLR) limits using CEA Group 6 or Group P.
• Periodically monitor QASI (PID 187).</td></tr>
</table>

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: 'A' Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
	SRO	12.9 IF unit auxiliaries powered from Unit Aux transformer AND desired to transfer electrical loads to SU #3, THEN perform the following: 12.9.1 Verify SU #3 available. 12.9.2 WHEN desired to transfer electrical loads, THEN transfer to SU #3 Transformer using Electrical System Operations (2107.001).
	BOP	12.10 Throttle Condensate recircs as necessary to maintain 650-750 psig Condensate Pump Discharge pressure: • 2CV-0662 (2FIC-0662) • 2CV-0663 (2FIC-0663)
Procedure Note: Do not tell Woodlands (SPO/EMO) (Power Marketing Corp.) anything other than the current status of the unit (e.g. we are going off-line). The TOC and SOC are the Entergy Transmission Organization and are responsible for monitoring the Grid System; this includes ensuring the adequacy of the ONLINE monitoring tool. Therefore, they can be given more specific information regarding the reason for the shutdown. Reference ENS-DC-201.		
	ANY	12.11 Notify the following of power reduction: • Chemistry • Reactor Engineering • Radiation Protection • Little Rock Dispatcher (TOC) • Woodlands Dispatcher (SPO/EMO)
Cue: If contacted as the above people, acknowledge the information concerning the power reduction.		
	SRO	12.12 Perform the following for Chemistry Control: • Monitor Secondary chemistry and adjust chemical feed as needed using Secondary System Chemical Addition (2106.028). • IF reducing power less than 90%, THEN verify Primary Zinc Injection secured per ONE of the following: − Request Chemistry secure Zinc Injection per Unit 2 Reactor Coolant System (RCS) Zinc Control (1052.037) − Perform "Securing Zinc Injection" section of Chemical Addition (2104.003).
Cue: If contacted as a NLO and/or chemistry, report that you will secure Zinc injection and monitor secondary chemistry.		

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 4
Event Description: ‘A’ Steam Generator Tube leak ramps up to 12 gpm over 5 min.		

Time	Position	Applicant's Actions or Behavior
	ANY	12.13 Verify FWBSCAL selected for COLSS Secondary Calorimetric at ~ 95% (PID 177).
	SRO	12.14 IF power change exceeds 15% within a one hour period, THEN notify Chemistry to obtain an RCS sample for Iodine between 2 and 6 hours following power change (TS 3.4.8).
Cue: If contacted as chemistry, report that you will obtain an RCS sample for Iodine at the time requested.		
OP-2203.038 Primary to Secondary Leakage AOP.		
	ANY	10. Initiate secondary contamination control using 2202.010 Attachment 19, Control of Secondary Contamination.
Cue: If contacted as a NLO to commences Att. 19, then report you will commence standard att. 19 Control of Secondary Contamination.		
	ANY	*11. Check VCT level 60 to 75%.
	SRO	*12. Notify SM to refer to the following: • Tech Specs: – 3.4.5, SG Tube Integrity – 3.4.6.2, Reactor Coolant System Leakage – 3.7.1.4, Secondary Activity • 1903.010, Emergency Action Level Classification **Examiner Note: SRO must enter TS 3.4.5 and 3.4.6.2 action a**
Termination criteria: When the required reactivity manipulation is complete and the appropriate TS have been entered or at lead examiner’s discretion.		

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 5

Event Description: CEA 49 fails to respond to insertion command.

Time	Position	Applicant's Actions or Behavior
This event will occur during the first CEA insertion.	ATC	ATC will insert CEA for ASI control.
	ATC	Transition to Exhibit 3 of OP-2105.009 CEDM Control System Operation
Procedure Note: • "CEA SELECTED" indicates selected CEA position. • "GROUP SELECTED" indicates average position of selected group. • If > 6 inch deviation occurs in any regulating group, rod motion is inhibited by PMS CEA sequencing program. • CEAC CH1 and CH2 annunciators on 2K04 and CEDMCS annunciators on 2K10 should be checked for applicability prior to moving CEAs.		
Exhibit 3, CEDMCS Operations	ATC	1.0 <u>IF</u> moving CEAs in group, <u>THEN</u> perform the following at 2C03: 1.1 Place Group Select switch to desired group position. 1.2 IF moving Group P CEAs, THEN place P Group Select switch to P. 1.3 Ensure Individual CEA Selection switches aligned to CEA in group selected to move. 1.4 Place Mode Select switch to MANUAL GROUP (MG) or MANUAL SEQUENTIAL (MS). *1.5 Observe CEAC and Pulse Counter CEA position indications to verify CEA motion and alignment as CEAs are moved. RAP 1.6 Position groups as desired using Manual Control lever. 1.7 Place Mode Select switch to OFF. 1.8 Verify Pulse Counter and CEAC indications match.
	ATC	The ATC should recognize that CEA 49 failed to move during the insertion and report to the CRS. Examiner Note: The Crew may elect to try to insert CEA 49 individually to align it with the group.
	ATC	The ATC should continue the power reduction and transition to group P CEAs for ASI control using Exhibit 3.
	SRO	The SRO will transition to OP-2203.003 CEA malfunction AOP.

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 5

Event Description: CEA 49 fails to respond to insertion command.

Procedure Note:

- Attachment D provides trip and shutdown criteria.
- Attachment E provides a list of possible Tech Spec actions to be taken within two hours of procedure entry.
- Steps marked with (*) are continuous action steps.
- Steps marked with (■) are floating steps.

	SRO	1. Open Placekeeping page.
	SRO	2. Stop ALL CEA movement.
	SRO	3. Notify Control Board Operators to monitor floating steps.

Procedure Note:

- CEA misalignment is defined as a CEA misaligned from its associated Group by outward deviation more than 5 inches or inward deviation more than 7 inches.
- For the purpose of defining CEA operability to satisfy TS LCO requirements, a CEA is inoperable under the following conditions:
  1. CEA is known to be untrippable or immovable as a result of excessive friction or mechanical interference (TS 3.1.3.1.a).
  2. CEA is known to be immovable as a result of CEDMCS malfunction (TS 3.1.3.1.b and 3.1.3.1.c).
  3. CEA is misaligned from ANY other CEA in its group by greater than 7 inches and can NOT be aligned (TS 3.1.3.1.d).
  4. CEA can NOT be exercised within the maximum TS surveillance time requirements of TS 4.1.3.1.2.
  5. Shutdown Bank CEA withdrawn to less than its full out position except for surveillance testing (TS 3.1.3.5).

	SRO	4. Refer to the following: • Tech Specs • Attachment E, Tech Spec Two Hour Actions
	SRO	*5. <u>IF</u> ANY CEAs immovable <u>AND</u> aligned, <u>THEN</u> GO TO Step 37. **Examiner Note: This step may be applicable or may not be applicable depending on the deviation from the group see note above. Step 37 is on page 31 of this exam.**
	SRO	*6. <u>IF</u> TWO or MORE CEAs misaligned by greater than 19 inches, <u>THEN</u> perform the following: A. Trip Reactor. B. GO TO 2202.001, Standard Post Trip Actions. **Examiner Note: This step is N/A.**

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 5

Event Description: CEA 49 fails to respond to insertion command.

	SRO	*7. IF TWO or MORE CEAs misaligned by greater than 7 inches, THEN perform the following: A. Commence Plant shutdown at greater than 14 %/hr using 2102.004, Power Operation. B. Refer to TS 3.1.3.1.e., CEA Position. **Examiner Note: This step is N/A.**
Procedure Note: TAVE computer point numbers that may be used include T-AVG and T4617-B.		
	ANY	8. Record the following: • Start time • Pre-misalignment Rx power _________ • TAVE change
	SRO	9. Check Reactor startup in progress. **(Not Met, perform contingency)**
	SRO	9. IF Reactor startup NOT in progress, THEN GO TO Step 17.
	SRO	17. Check inward CEA misalignment exists.
	SRO	17. IF outward CEA misalignment exists, THEN perform the following: A. IF associated group less than 11.42 inches or greater than 138.58 inches withdrawn, THEN perform the following: 1) IF CEA misaligned greater than 7 inches, THEN GO TO Step 18. 2) IF CEA misaligned 7 inches or less, THEN GO TO Step 37. **Examiner Note: The CEA will be withdrawn greater than 138.58 inches. CEA 49 should be misaligned less than 7 inches.**
	SRO	37. IF ANY CEAs withdrawn AND immovable, THEN perform the following: A. Notify I&C to perform CEA traces to determine affected CEAs trippable status. B. Refer to the following TS: • 3.1.3.1.b, CEA Position • 3.1.3.1.c, CEA Position **Examiner Note: The SRO should contact I&C to perform CEA traces and after I&C's report the SRO should enter TS 3.1.3.1b for CEA 49.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 5
Event Description: CEA 49 fails to respond to insertion command.		
Cue: When contacted as the work management or I&C to troubleshoot, wait 3 minutes and then call and report that you are standing by for CEA 49 troubleshooting and ask the control room to insert CEA 49 for traces.		
	ATC	Transition to Exhibit 3 of OP-2105.009 CEDM Control System Operation to insert CEA 49
Exhibit 3, CEDMCS Operations	ATC RAP	2.0 IF moving CEA individually, THEN perform the following: 2.1 Verify Group Select switch selected to group containing individual CEA. 2.2 Place Individual CEA Selection switches to desired CEA. 2.3 Place Mode Select switch to MANUAL INDIVIDUAL (MI). *2.4 Observe CEAC and Pulse Counter CEA position indications to verify CEA motion and alignment as CEAs are moved. 2.5 Position CEA as desired using Manual Control lever. 2.6 WHEN individual CEA movement complete, THEN place Mode Select switch to OFF. 2.7 Verify Pulse Counter and CEAC indications match.
Cue: After CEA 49 insertion is attempted, wait one minute then report that CEA 49 is not inserting due to a failed hall effect transducer and it will have to be replaced. Report that it will take ~ 20 minutes to replace.		
Procedure Note: A CEA is considered untrippable with CEDMCS operable AND CEA immovable.		
	SRO	38. IF ANY CEAs determined to be untrippable, THEN perform the following: **Examiner Note: This step is N/A.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 5

Event Description: CEA 49 fails to respond to insertion command.

Procedure Note:

- For the purpose of defining CEA operability to satisfy TS LCO requirements, a CEA is inoperable under the following conditions:
  1. CEA is known to be untrippable or immovable as a result of excessive friction or mechanical interference (TS 3.1.3.1.a).
  2. CEA is known to be immovable as a result of CEDMCS malfunction (TS 3.1.3.1.b and 3.1.3.1.c).
  3. CEA is misaligned from ANY other CEA in its group by greater than 7 inches and can NOT be aligned (TS 3.1.3.1.d).
  4. CEA can NOT be exercised within the maximum TS surveillance time requirements of TS 4.1.3.1.2.
  5. Shutdown Bank CEA withdrawn to less than its full out position except for surveillance testing (TS 3.1.3.5).

	SRO	39. Check affected CEAs operable as follows: • Known to be trippable. • Known to be movable. • Aligned within 7 inches of associated group. • All surveillance requirements met. • All Shutdown banks at FULL out position. **Examiner Note: CEA 49 is not operable but is trippable and the SRO should perform the contingency.**
	SRO	39. Perform the following: A. IF ANY CEA untrippable, THEN **RETURN TO** step 38. **Examiner Note: This step is N/A.**
	SRO	B. IF ONE CEA remains misaligned greater than 7 inches, THEN perform the following: **Examiner Note: This step is N/A.**
	SRO	C. IF more than ONE CEA remains misaligned greater than 7 inches, THEN perform the following: **Examiner Note: This step is N/A.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 5
Event Description: CEA 49 fails to respond to insertion command.		

	SRO	D. IF ONE or more CEAs immovable but trippable and aligned within 7 inches of associated group, THEN perform the following: 1) Refer to the following TS: • 3.1.3.1.b, CEA Position • 3.1.3.1.c, CEA Position 2) Notify Operations management. **Examiner Note: The SRO should enter TS 3.1.3.1b for CEA 49.**

Termination criteria: When the ATC has inserted group P to control ASI, traces have been performed on CEA 49 and SRO has entered the appropriate TS or at the discretion of the lead examiner.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8
Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	The crew should recognize that steam generator tube leak has degraded.
	SRO	Direct the RCS leak rate to be assessed.
	ATC/BOP	Determine that the RCS leakrate is greater than 44gpm.
	SRO	Direct actions from OP-2203.038 Primary to Secondary leakage. 6. IF EITHER of the following conditions exist: • RCS leakage greater than or equal to 44 gpm • PZR level continues to lower with ALL available Charging pumps running AND Letdown isolated THEN perform the following: A. Verify closed Main Steam Supply valve to 2P7A from leaking SG: • SG "A" TO EMER FW PUMP TURBINE (2CV-1000-1) • SG "B" TO EMER FW PUMP TURBINE 2CV-1050-2 B. Refer to TS 3.7.1.2, Emergency Feedwater System. **Examiner Note: Steam to 2P-7A should already be isolated.**
	ATC	C. IF in Modes 1 or 2, THEN perform the following: 1) Trip Reactor. 2) Actuate SIAS. 3) Actuate CCAS. 4) **GO TO** 2202.001, Standard Post Trip Actions.
	SRO	Enter OP-2202.001, Standard Post Trip Actions EOP.

Examiner Note: After the crew determines that there is an excess steam demand occurring they may actuate Main Steam Isolation Signal (MSIS) and pull forward the steps from the RCS heat removal section of SPTAs to secure feedwater sources to 'A' Steam Generator.

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 6, 7, & 8

Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	SRO	1. Notify Control Board Operators to perform the following: A. Monitor safety functions using Exhibit 7, CBO Reactor Trip Checklist. B. Perform post trip contingencies as required.
	SRO	2. Open Safety Function Tracking page.
Reactivity control Safety Function	ATC	3. Check Reactivity Control established as follows: A. Reactor power lowering. B. Check startup rate is negative. C. ALL CEAs fully inserted by observing ANY of the following:
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.
	BOP	B. Generator Output breakers open.
	BOP	C. Perform EITHER of the following as required: 1) Check the following valves closed: • MSR 2E-12A Steam Supply From SG A (2CV-0400) • MSR 2E-12B Steam Supply From SG B (2CV-0460) 2) No flow indicated on the following MSR second stage flow instruments: • 2FI-0402 • 2FI-0462
	BOP	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. **(Not met, contingency is satisfied.)**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
Vital Auxiliaries Safety Function	ANY	Perform Step 4.G. Contingency Actions. 4. G. IF ANY DG running AND SW NOT aligned, THEN locally stop DG by unlocking and placing "ENGINE CONTROL" handswitch in LOCKOUT: • 2E11 • 2E21 **Examiner Note: Service water will be aligned to EDGs**
	BOP	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. **(May not be met due to SGTR and ESD Event, then perform contingency)** B. RCS MTS 30°F or greater.
	SRO	Perform Step 5 Contingency Actions. 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,	BOP	6. Check RCS Pressure Control: • 1800 to 2250 psia. • Trending to setpoint. **(May not be met due to SGTR and ESD Event, perform contingency)** • Normal PZR Spray and heaters controlling pressure. • Valid CNTMT Spray NOT in progress. **(May not met due to ESD Event, perform contingency)**

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	SRO	Perform Step 6 Contingency Actions. 6. Perform as necessary: C. IF valid CNTMT Spray in progress, THEN verify ALL RCPs tripped. D. IF RCP 2P32A or 2P32B stopped, THEN verify associated PZR Spray valve in MANUAL and closed: • RCP A Spray Valve (2CV-4651) • RCP B Spray Valve (2CV-4652) E. IF ALL RCPs stopped AND RCS pressure control required, THEN initiate Aux spray using Attachment 48, RCS Pressure Control. F. 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. G. Verify PZR Pressure Control system restoring pressure to setpoint. **Critical Task: Component cooling water to RCPs must be restored within 10 minutes of CIAS or All RCPs must be secured within the next 10 minutes.**
	ATC	Implement OP-2202.010, Standard Attachment, Attachment 48.

Attachment 48 Procedure Note:
Once method of pressure control is established, this attachment is not required in hand or continuous use.
A change to the method of pressure control will require in hand or continuous use until the new pressure control method is established.

Time	Position	Applicant's Actions or Behavior
Steps from Attach. 48	ATC	*1. Maintain RCS pressure with heaters and spray using one or more of the following: D. IF desired to use AUXILIARY Spray, THEN perform the following: *1) Verify RCS MTS greater than 30 degrees. 2) Verify at least ONE Charging pump running. 3) Close Regen HX to RCP B/C valves: • 2CV-4827-2 • 2CV-4831-2

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
		Procedure Note: PZR Spray Block valves 2CV-4653 and 2CV-4655 are de-energized due to degraded power supply cables.
Steps from Attach. 48.	ATC	4) Verify PZR Spray (2CV-4651/2CV-4652) or PZR Spray Isolation valves (2HS-4655/2HS-4653) closed. 5) Throttle Aux Spray valve (2CV-4824-2) as necessary. 6) <u>IF</u> Regen HX to RCS temperature (2TI-4825) can NOT be reduced to less than 275°F, <u>THEN</u> perform ONE of the following: a) Isolate Letdown to reduce temperature. b) Complete Table 1 of this attachment.
Steps from Attach. 48.	ATC	7) <u>IF</u> Regen HX to RCS (2TI-4825) AND PZR water phase (2TI-4627) differential temperature greater than 200°F AND PMS is unavailable, <u>THEN</u> complete Table 1 of this attachment.
	SRO	Implement remaining steps from OP-2202.001, Standard Post Trip Actions Steps.
Core Heat Removal Safety Function.	ATC	7. Check Core Heat Removal by forced circulation: A. At least ONE RCP running. **(May not be met, perform contingency)**
	SRO	Perform Step 7 Contingency Actions. A. <u>IF</u> ALL RCPs stopped, <u>THEN</u> perform the following: 1) Verify BOTH PZR Spray valves in MANUAL and closed. • 2CV-4651 • 2CV-4652 2) GO TO Step 8.

TIME		TEMPERATURE		
SPRAY VALVE OPENED	SPRAY VALVE CLOSED	(PZR WATER PHASE) 2TI-4627	2TIS-4607 2TIS-4608 2TI-4825	DIFFERENCE

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
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 **(Not met, perform contingency)**
	ANY	Perform Step 8.A Contingency Actions when applicable. A. Perform the following: 1) <u>IF</u> SG level lowering, <u>THEN</u> verify EFAS actuated.
RCS Heat Removal Safety Function	BOP/ATC	B. Check MFW in RTO **(Not Met, Perform contingency)**
	ANY	Perform Step 8.B Contingency Actions. B. Verify EITHER of the following: • BOTH MFW pumps tripped. **(Both MFW pumps will be tripped)** • SG levels controlling at setpoint
RCS Heat Removal Safety Function	ATC/BOP	C. Check Feedwater line intact by the following: • SG level stable or rising. **(Not Met, Perform contingency)** • NO unexplained step changes or erratic FW flow. • NO unexplained step changes or erratic Condensate flow.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal Safety Function	ANY	Perform Step 8.B Contingency Actions. C. IF indication of FW rupture exists, THEN perform the following as necessary: • For RUPTURE in MFW header: 1) Verify ALL MFW pumps tripped. 2) Verify ALL Condensate pumps tripped. 3) Close MFW Block valves. 4) **GO TO** Step 8.D. • For RUPTURE in EFW header: 1) Verify EFW/AFW pump tripped for ruptured header. 2) Close associated EFW Block valves. **Examiner Note: The applicants may have already performed these steps.**
RCS Heat Removal Safety Function	ATC/BOP	D. Check RCS TC 540°F to 555°F. **(Not Met, perform Contingency)**
	ANY	Perform Step 8.D Contingency Actions. 2) <u>IF</u> TC less than 540°F, <u>THEN</u> perform the following: a) Verify Feedwater flow rate (MFW OR EFW) NOT causing TC to lower. b) Verify SDBCS restoring TC 540°F to 555°F using 2105.008 Exhibit 3, SDBCS Emergency Operation. c) <u>IF</u> MSIS actuated AND the cooldown terminates, <u>THEN</u> stabilize TC and maintain post-cooldown conditions as follows: • Maintain RCS pressure within P-T limits with PZR heaters and spray using Attachment 48, RCS Pressure Control. • Maintain RCS temperature by steaming intact SG using Upstream ADV or Upstream ADV Isolation MOV

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal Safety Function	ATC/BOP	E. Check SG pressure 950 to 1050 psia. **(Not Met, perform Contingency)**
	ANY	Perform Step 8.E Contingency Actions. E. Perform as necessary: 1) IF SG pressure 751 psia or less, THEN perform the following: a) Verify MSIS actuated on PPS inserts. b) Verify feed secured to the affected SG.
	ALL	c) Maintain RCS post-cooldown conditions as follows: • Maintain RCS pressure within P-T limits with PZR heaters and spray using 2202.010 Attachment 48, RCS Pressure Control. • Maintain RCS temperature by steaming intact SG using Upstream ADV or Upstream ADV Isolation MOV. d) **GO TO** Step 9. **Examiner Note: Critical Task, Maintain RCS pressure within the Pressure-Temperature limits of 200°F and 30°F Margin to Saturation throughout implementation of SPTAs and Functional Recovery EOP.**
	BOP	Implement OP-2105.008, SDBCS Emergency Operations.
Steam Dump Exhibit 3	BOP	1.0 IF BOTH MSIV's closed, THEN GO TO step 5.0. **Examiner Note: MSIVs are closed.**
	BOP	5.0 Perform the following to determine availability of SDBCS valves: 5.1 IF the following conditions satisfied: • Instrument air available • Emergency OFF (2K02-A14) clear • Power available to selected controllers/valves THEN Upstream ADV are available: **Examiner Note: Upstream ADVs are available.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
Steam Dump Exhibit 3	BOP	6.0 IF operation of Upstream Atmospheric Dump valve from the Control Room desired, THEN perform the following: 6.1 Verify selected HIC in MANUAL with ZERO output demand: • Hdr #1 UPSTM ADV 2CV-1001 (2HIC-1001) • Hdr #2 UPSTM ADV 2CV-1051 (2HIC-1051) 6.2 Place selected valve(s) permissive handswitch in MANUAL: • 2CV-1001 Permissive (2HS-1001) • 2CV-1051 Permissive (2HS-1051) 6.3 IF MSIS actuated, THEN override "MSIS CLOSE" actuation for selected MOV isolation: • ADV Upstream Isolation valve (2CV-1002) • ADV Upstream Isolation valve (2CV-1052) *6.4 Throttle open selected MOV as desired: • ADV Upstream Isolation valve (2CV-1002) • ADV Upstream Isolation valve (2CV-1052) *6.5 Place selected HIC to desired demand: • Hdr #1 UPSTM ADV 2CV-1001 (2HIC-1001) • Hdr #2 UPSTM ADV 2CV-1051 (2HIC-1051)
	SRO	Implement remaining steps from OP-2202.001, Standard Post Trip Actions Steps.
Containment Safety Function	ANY	9. Check CNTMT parameters: A. Temperature and Pressure: **(Not met due to ESD Event, Perform contingency)** • Temperature less than 140°F. • Pressure less than 16 psia.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	ANY	Perform Step 9.A Contingency Actions. 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.
	ANY	B. Check CNTMT Spray pumps secured. **(May not be Met)**
Containment Safety Function	ANY	Perform Step 9.B Contingency Actions. B. IF CSAS inadvertent, THEN perform the following: 1) Place BOTH CNTMT Spray pumps (2P35A/B) in PTL. Record time: __________ **Examiner Note: Step is not applicable.**
	ANY	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

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
Containment Safety Function	ANY	D. NO secondary system radiation alarms or unexplained rise in activity: **(Not met)** 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. Direct NLOs to perform 2202.010 Attachment 47, Field Operator Post Trip Actions. 12. Verify Reactor trip announced on Plant page. 13. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
Cue: If contacted as the STA to report to the control room, acknowledge the request. Cue: If contacted as a NLO to perform Attachment 47 Field Operator Post Trip Actions, acknowledge request.		
	SRO	14. Direct control board operators to acknowledge ALL annunciators and announce ALL critical alarms.
	SRO	15. Check ALL safety function acceptance criteria satisfied. **(All safety functions are not satisfied, perform contingency)**
	SRO	Perform Step 15 Contingency Actions. 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 OP-2202.009, Functional Recovery EOP.
	SRO	Enter OP-2202.009, Functional Recovery EOP.
	SRO	*1. Notify Shift Technical Advisor to perform Safety Function Status Checks for appropriate success paths at the following times: • Initially after appropriate success paths identified • Every 15 minutes thereafter.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8
Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.		

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: RCS pressure may be less than 1400 psia due to the ESD but it also could have recovered greater than 1400 psia and all contingency action have already been performed.**
	ANY	Step 4 Contingency Actions have already been performed. *4. Perform the following: 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.
	ANY	* 6. IF SIAS or MSIS actuated, THEN perform the following: A. Verify at least ONE SW pump running on EACH loop. B. Check EITHER DG running. C. Verify running DG SW Outlet valve open: • 2CV-1503-1 • 2CV-1504-2 D. Verify SW pump suction aligned to Lake. E. Check 4160v Non-vital bus 2A1 OR 2A2 energized from offsite power. F. Check 4160v Vital buses 2A3 AND 2A4 energized from offsite power. G. Start SW pumps as needed to maintain SW header pressure. H. Check SW to CCW restored. **(Not met, perform contingency)**
	BOP	Perform Step 6.H Contingency Actions. H. IF CCW available, THEN restore SW to CCW, refer to 2202.010 Exhibit 5, CCW/ACW/SW Alignment.
	ANY	I. Check ACW restored. **(Not met, perform contingency)**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	BOP	Perform Step 6.I Contingency Actions. I. Restore SW to ACW, refer to 2202.010 Exhibit 5, CCW/ACW/SW Alignment.
	ANY	J. Maintain SW header pressure greater than 85 psig.
	SRO	7. <u>IF</u> CCW in service to provide SG Sample Cooler cooling, <u>THEN</u> perform the following: B. <u>IF</u> SG "B" has indicated water level, <u>THEN</u> verify the following SG 'B' Sample Valves open: • 2CV-5858 • 2CV-5859-2 C. Notify Chemistry to sample available SGs for activity.
Cue: When contacted as Chemistry, then report you will sample 'B' S/G for activity.		
	SRO	8. Check ALL available Hydrogen Analyzers in service using 2104.044, Containment Hydrogen Control Operations. **(Not met, perform contingency)**
	SRO	Perform Step 8 Contingency Actions. 8. Verify all available Hydrogen Analyzers in service within 70 minutes from start of event. B. Record time from Entry Section step 2: Time_______________
	SRO	9. Open Functional Recovery Success Path Tracking page.
	SRO	10. Notify Control Board Operators to perform the following: A. Monitor floating steps. B. Verify actuated ESFAS components using 2202.010 Exhibit 9, ESFAS Actuation.
	BOP	Implement OP-2202.010, Exhibit 9 ESFAS Actuation.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8
Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.		

Time	Position	Applicant's Actions or Behavior
Exhibit 9 ESFAS actuation.	BOP	*1.0 IF any abnormalities noted for affected ESFAS actuation, THEN notify CRS. 2.0 IF SIAS, THEN verify the following: ☐ Red Train RWT Outlet (2CV-5630-1) open. ☐ Red Train HPSI Pump in service with proper discharge pressure and flow. ☐ Red Train HPSI Injection MOVs open. ☐ Red Train Service Water Pump in service with proper discharge pressure. ☐ Red Train LPSI Pump (2P60A) in service with proper discharge pressure and flow. ☐ Red Train LPSI Injection MOVs open. ☐ Green Train RWT Outlet (2CV-5631-2) open. ☐ Green Train HPSI Pump in service with proper discharge pressure and flow. ☐ Green Train HPSI Injection MOVs open. ☐ Green Train Service Water Pump in service with proper discharge pressure. ☐ Green Train LPSI Pump (2P60B) in service with proper discharge pressure and flow. ☐ Green Train LPSI Injection MOVs open. ☐ Available Charging Pumps in service with proper discharge pressure and flow. ☐ Service Water Outlet Valves open for #1 and #2 EDGs. 3.0 IF CCAS, THEN verify the following: ☐ Red Train CNTMT Coolers in service. ☐ Service Water aligned to Red Train CNTMT Coolers. ☐ Red Train Bypass Dampers open. ☐ Green Train CNTMT Coolers in service. ☐ Service Water aligned to Green Train CNTMT Coolers. ☐ Green Train Bypass Dampers open.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8
Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.		

Time	Position	Applicant's Actions or Behavior
Exhibit 9 ESFAS actuation.	BOP	4.0 IF CSAS, THEN verify the following: ☐ Red Train CSS Pump (2P35A) in service with proper discharge pressure and flow. **(Will not be running and should be started)** ☐ Red Train CSS Header Isolation (2CV-5612-1) open. ☐ Green Train CSS Pump (2P35B) in service with proper discharge pressure and flow. ☐ Green Train CSS Header Isolation (2CV-5613-2) open. ☐ Main Feedwater Block valves closed. ☐ MSIVs closed. ☐ Main Feed pumps tripped. ☐ Condensate pumps secured. ☐ Heater Drain pumps secured. 5.0 IF MSIS, THEN verify the following: ☐ MSIVs closed. ☐ Main Feedwater Block valves closed. ☐ Red Train Service Water Pump in service with proper discharge pressure. ☐ Green Train Service Water Pump in service with proper discharge pressure. ☐ Main Feed pumps tripped. ☐ Condensate pumps secured. ☐ Heater Drain pumps secured.
Cue: If contacted as NLO to investigate 2P-35A spray pump and breaker, then after ~ 1 min. report the breaker is open and looks normal locally. After ~ 2 min. report that 2P-35A motor and pump look normal locally.		
	SRO	Implement remaining Steps of OP-2202.009, Functional Recovery entry section.
Examiner Note: The determination of safety functions may change based on the timing of the scenario, the expected assessment is listed at the bottom of each safety function.		
	ANY	11. Determine safety function status as follows: A. Check Reactivity Control satisfied by EITHER of the following: • Maximum of ONE CEA NOT fully inserted and Reactor power lowering. • Reactor power less than 10-1% and stable or lowering. **Examiners Note: Reactivity will be satisfied.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	ANY	B. Check Vital DC Auxiliaries satisfied: 1) At least ONE 125v Vital DC bus energized: • 2D01-SPDS point E2D01 • 2D02-SPDS point E2D02 2) At least ONE 120v Vital AC bus energized: • 2RS1 - SPDS point E2RS1 or E2RS1RS3 • 2RS2 - SPDS point E2RS2 or E2RS2RS4 • 2RS3 - SPDS point E2RS3 or E2RS1RS3 • 2RS4 - SPDS point E2RS4 or E2RS2RS4 **Examiners Note: Vital DC will be satisfied.**
	ANY	C. Check Vital AC Auxiliaries satisfied: 1) At least ONE 4160v Vital AC bus (2A3/2A4) energized. **Examiners Note: Vital AC will be satisfied.**
	ANY	D. Check RCS Inventory Control satisfied: 1) CVCS maintaining PZR level 10 to 80% [40 to 70%] and level stable or trending to setpoint. 2) RCS MTS 30°F or greater. 3) RVLMS LVL 03 or higher elevation indicates WET. **Examiners Note: Inventory Control may not be satisfied due to PZR level and the ESD event.**
	ANY	E. Check RCS Pressure Control satisfied: 1) RCS pressure maintained within P-T limits, refer to Attachment 1, P-T Limits. **Examiners Note: P-T limits should be satisfied.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	ANY	F. Check RCS and Core Heat Removal satisfied: 1) At least ONE intact SG available for Heat Removal by EITHER of the following: • Level 10 to 90% [20 to 90%] with FW available. • Level being restored with total FW flow of 485 gpm or greater. 2) Uncontrolled SG depressurization NOT in progress. 3) IF ANY RCP operating, THEN RCS ΔT less than 10°F and NOT rising. 4) IF ALL RCPs secured, THEN RCS ΔT less than 50°F and NOT rising. 5) RCS T_C less than 555°F and NOT rising. 6) RCS MTS 30°F or greater. 7) RVLMS LVL 01 indicates WET. **Examiners Note: RCS and Core Heat Removal may not be satisfied due to the ESD.**
	ANY	G. Check CNTMT Isolation satisfied: 1) CNTMT parameters normal: a) "CNTMT RADIATION HI" annunciator (2K10-A6) clear. b) NO unexplained rise in CNTMT radiation. c) CNTMT pressure less than 18.3 psia. **(Not met, perform contingencies)** 2) "SEC SYS RADIATION HI" annunciator (2K11-A10) clear. 3) NO unexplained rise in Secondary Systems Radiation monitor trends: • Main Steam lines • SG Sample • Condenser Off Gas **Examiners Note: CNTMT Isolation will not be satisfied due to ESD event and SGTR event.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	ANY	CNTMT Isolation contingencies: 1) Verify CNTMT isolation as follows: • CIAS actuated components are properly aligned, using 2202.010 Attachment 5, CIAS Verification. • ONE Emergency Penetration Room Vent fan running. • EACH penetration NOT required to be open has at least ONE isolation valve closed. **Examiner Note: The SRO may prioritize the attachment 5 for later in the event due to actions that are a higher priority.**
Standard Attachment 5	ANY	(see table below)

COMPONENT DESCRIPTION	1.0 NUMBER	2.0 LOCATION	3.0 POSITION	√
REGEN HX INLET	2CV-4821-1	2C09	CLOSED	
REGEN HX OUTLET	2CV-4823-2	2C09	CLOSED	
CNTMT PURGE SUPPLY V1 INSIDE	2CV-8289-1	2C17	CLOSED	
CNTMT PURGE SUPPLY V1 OUTSIDE OUTSIDE	2CV-8283-1	2C17	CLOSED	
CNTMT PURGE EXHAUST V2 INSIDE	2CV-8291-1	2C17	CLOSED	
CNTMT PURGE EXHAUST V2 OUTSIDE OUTSIDE	2CV-8285-1	2C17	CLOSED	
SAMPLE ISOLATION VALVE QUENCH TANK LIQ	2SV-5878-1	2C17	CLOSED	
SAMPLE ISOLATION VALVE RCS	2SV-5833-1*	2C17	CLOSED	
RCP CCW SUPPLY	2CV-5236-1*	2C17	CLOSED	
RCP CCW RETURN	2CV-5255-1*	2C17	CLOSED	
CNTMT CHILL WATER SUPPLY	2CV-3852-1	2C17	CLOSED	
CNTMT CHILL WATER RETURN	2CV-3851-1	2C17	CLOSED	
RX DRAIN TANK DISCH ISOL	2CV-2202-1	2C17	CLOSED	
CNTMT VENT HEADER ISOL	2CV-2401-1	2C17	CLOSED (1)	
CNTMT SUMP DRAIN	2CV-2060-1	2C17	CLOSED	
RCP BLEEDOFF TO VCT	2CV-4846-1	2C17	CLOSED	
CNTMT AIR SAMPLE NORTH INSIDE SUPPLY	2SV-8265-1*	2C17	CLOSED	
CNTMT AIR SAMPLE NORTH INSIDE RETURN	2SV-8259-1*	2C17	CLOSED	
CNTMT AIR SAMPLE SOUTH INSIDE SUPPLY	2SV-8273-1*	2C17	CLOSED	
CNTMT AIR SAMPLE SOUTH INSIDE RETURN	2CV-8233-1*	2C17	CLOSED	
PASS SUMP SAMPLE SUPPLY ISOL	2SV-5634-1*	2C17	CLOSED	
PASS SUMP SAMPLE RETURN ISOL	2SV-5633-1*	2C17	CLOSED	

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	ANY	H. Check CNTMT Temperature and Pressure Control satisfied: 1) CNTMT pressure less than 16 psia. 2) CNTMT temperature less than 140°F. **Examiners Note: CNTMT Temperature and Pressure Control may not be satisfied due to excess steam demand.**
	ANY	12. 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”
Cue: If contacted to remove the danger tags and close the LTOP breakers, then wait 2 minutes and use the remote function for 2B51-E4 and 2B51-K2 to close the breakers and inform the control room that 2B51-E4 and 2B51-K2 are closed.		
	SRO	*13. Check ALL Safety Function acceptance criteria satisfied.
	SRO	Perform Step 13 Contingency Actions. *13. Perform the following: A. Determine appropriate success paths using Success Path Decision Trees. B. Initiate success paths for ALL Safety Functions in the following order: 1) Jeopardized. 2) Challenged. 3) Satisfied. C. IF higher priority Safety Function jeopardized AND lower priority safety function success path in progress, THEN **GO TO** appropriate success path for highest priority safety function in jeopardy. D. WHEN success path implemented for EACH Safety Function, THEN RETURN TO Step 14 of Entry procedure.
Examiner Note: The SRO should complete the safety functions in order of hierarchy that are Jeopardized 1st, Challenged 2nd, and then the Satisfied safety functions.		

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
		Examiner Note 1: If Inventory Control is not Satisfied then Diagnose IC-2 as the first Jeopardized Success path and HR-2 as the second success path. **Examiner Note 2: The SRO may determine that the inventory control was satisfied based on timing and complete the actions from HR-2 to control the ESD and isolate the SG with the tube rupture which start on page 58.** **Examiner Note 3: Inventory control and Heat removal may be satisfied based on the timing of the event and the SRO implement containment isolation. If this occurs, the SG isolation steps are the same as the ones in heat removal and start on page 61.**
	SRO	Implement Inventory Control Steps of OP-2202.009, Functional Recovery.
Steps from IC-2	ANY	1. Verify SIAS and CCAS actuated on PPS inserts. *2. Verify Safety Injection flow to RCS as follows: A. Verify at least ONE HPSI pump running. B. Verify running HPSI Injection MOVs open. C. Verify ALL available Charging pumps running. D. Check RCS pressure less than 1390 psia. **(May or May not be but contingencies actions are not required)** E. Check total HPSI flow acceptable using 2202.010 Exhibit 2, HPSI Flow Curve. F. Check total LPSI flow acceptable using 2202.010 Exhibit 3, LPSI Flow Curve.
	ANY	*3. IF CNTMT Spray pumps are running AND ALL of the following are TRUE: • CNTMT pressure less than 73.7 psia (59 psig). • At least two CNTMT Cooling Fans running. • SIAS actuated and flow acceptable per the following: - 2202.010 Exhibit 2, HPSI Flow Curve - 2202.010 Exhibit 3, LPSI Flow Curve THEN perform the following: A. Place EITHER CNTMT Spray pump (2P35A/B) in PTL. B. Verify CNTMT pressure maintained less than 73.7 psia (59 psig).
	ANY	■4. Check CCW flow aligned to RCPs. 5. Check at least ONE 4160v Vital bus energized.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
Steps from IC-2	ANY	■6. Terminate/throttle HPSI flow as follows: A. Check HPSI flow NOT required for Success Path RC-3, Boration Using HPSI. B. Check the following criteria satisfied: 1) RCS MTS 30°F or greater. 2) PZR level greater than 29% [50%] and controlled. 3) RVLMS LVL 03 or higher elevation indicates WET. 4) At least ONE intact SG available for Heat Removal by EITHER of the following: • Level 10% to 90% [20% to 90%] AND FW available. • Level being restored AND total FW flow of 485 gpm or greater. **Examiner Note: HPSI Throttle criteria may not be met due to PZR level and the SRO should go to the next step.**
	ANY	*7. Monitor HPSI termination/throttle criteria satisfied for duration of event.
	ANY	8. Override LPSI as follows: A. Check LPSI termination criteria satisfied as follows: • RCS pressure greater than 200 psia. • RCS pressure controlled. **Examiner Note: RCS pressure may not be controlled at this point and LPSI not terminated, also the priority is to control the ESD and isolate the SG.**
	ANY	*9. Monitor LPSI termination criteria satisfied for duration of event.
	ANY	*10. <u>IF</u> possible, <u>THEN</u> initiate action to refill the RWT by ANY of the following: • Normal makeup per 2104.003, Chemical Addition • Makeup from Holdup tanks per 2104.006, Fuel Pool Systems • Makeup from SFP per 2104.006, Fuel Pool Systems • Instruct TSC to consider RWT Refill strategy per SAMG. **Examiner Note: The SRO may prioritize completing this step later in the event.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8
Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.		

Time	Position	Applicant's Actions or Behavior
Steps from IC-2	ANY	*11. Check LOCA in progress. A. Check LOCA limited to CNTMT: • RWT level lowering with corresponding rise in CNTMT Sump level. • CNTMT temperature, pressure, and dewpoint greater than pre-event values. • Aux Building area radiation levels stable. • Aux Building Sump level less than 53%. • Waste Tanks 2T20A/B level stable.
	ANY	■12. <u>WHEN</u> "RWT LEVEL LO LO RAS PRETRIP" annunciator (2K06-A9) in alarm, <u>THEN</u> perform the following: **Examiner Note: The alarm will be clear.**
	ANY	■13. <u>WHEN</u> RWT level less than 6%, <u>THEN</u> perform the following: **Examiner Note: RWT level will be > 6%.**
	ANY	*14. Verify Early HPSI Termination as follows: A. Check indication(s) of CNTMT Sump Blockage as per 2202.010 Attachment 43, ECCS/CSS Pump Monitoring. **(Not met due to no RAS)** A. GO TO Step 15.
	ANY	*15. Instruct TSC to consider Alternate RCS Injection strategy.
	ANY	*16. Monitor Loss of ECCS/CSS pump suction as follows: A. Check ECCS/CSS pump suction acceptable using 2202.010 Attachment 43, ECCS/CSS Pump Monitoring. **(Not applicable due to no RAS)** B. Check total HPSI flow acceptable using 2202.010 Exhibit 2, HPSI Flow Curve.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: 'A' Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, 'A' Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
Steps from IC-2	SRO	17. Check acceptance criteria for Inventory Control satisfied: A. CVCS requirements: • ALL available Charging pumps running. OR • HPSI termination/throttle criteria satisfied. OR • RAS actuated. B. HPSI requirements: • HPSI injection flow acceptable, refer to Exhibit 2, HPSI Flow Curve. OR • HPSI termination/throttle criteria satisfied. C. LPSI requirements: • LPSI injection flow acceptable, refer to Exhibit 3, LPSI Flow Curve. OR • LPSI termination criteria satisfied. OR • RAS actuated. D. RVLMS LVL 06 or higher elevation indicates WET.
	SRO	Implement Heat Removal Steps of OP-2202.009, Functional Recovery.
Procedure Note: **Isolate leaking SG within 30 minutes of procedure entry to limit off-site release.**		
	ANY	1. Check SIAS setpoints exceeded by EITHER of the following: • RCS pressure 1650 psia or less. • CNTMT pressure 18.3 psia or greater.
	ANY	2. Verify SIAS and CCAS actuated on PPS inserts.

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	ANY	*3. Verify Safety Injection flow to RCS as follows: A. Check total HPSI flow acceptable using Exhibit 2, HPSI Flow Curve. B. Check RCS pressure less than 1390 psia. **(May or May not be but contingencies actions are not required)** C. Check total LPSI flow acceptable using Exhibit 3, LPSI Flow Curve.
	ATC	*4. IF EITHER 4160v Vital bus 2A3 OR 2A4 energized, THEN maintain shutdown margin during cooldown by EITHER of the following: • Determine boration requirements using 2202.010 Attachment 28, Boric Acid Required for Shutdown Margin. • Verify Emergency Boration in progress, using 2202.010 Exhibit 1, Emergency Boration. **Examiner’s note: They should just verify emergency boration is in progress which automatically occurs when SIAS actuates.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	ATC	Examiner note: all actions from step 5 should already by complete. ■5. IF EITHER 4160v Vital bus 2A3 OR 2A4 energized, THEN commence RCS cooldown as follows: A. Reset Low SG Pressure setpoints during cooldown and depressurization. B. Verify a maximum of ONE RCP running in EACH loop. C. IF RCP 2P32A or 2P32B stopped, THEN verify associated PZR Spray valve in MANUAL and closed. D. Monitor cooldown rate as follows: • Record RCS T_C and PZR temperature using 2202.010 Attachment 8, RCS Cooldown Table. • Plot RCS pressure versus RCS T_C using 2202.010 Attachment 1, P-T Limits every 15 minutes. E. Initiate RCS cooldown using SDBCS Bypass valves or ADVs. F. IF EFW or AFW available, THEN secure MFW flow as follows: 1) Trip running MFW pump. 2) Close ALL MFW Block valves. 3) Verify maximum of one condensate pump in service. 4) Maintain condensate header pressure less than 700 psig using condensate pump recircs and MFW pump recircs.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	ANY	*6. IF ALL RCPs secured, THEN perform the following: A. Check natural circulation conditions established in at least ONE loop by ALL of the following: • Loop ΔT less than 50°F. • T_H and T_C constant or lowering. • RCS MTS 30°F or greater. • ΔT between T_H and average CETs less than 10°F.
	SRO	7. Check BOTH 4160v Vital buses 2A3 AND 2A4 de-energized. **(Not Met, perform contingency)** Step 7 contingency. 7. GO TO Step 11.
	SRO	11. Check BOTH 4160v Non-vital buses 2A1 AND 2A2 de-energized. **(Not Met, perform contingency)** Step 7 contingency. 11. GO TO Step 13.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	ANY	13. Check for indications of SG tube leakage by the following: A. SG sample results indicate rising activity. B. Secondary system activity rising: 1) Main steam lines • 2RI-1007 • 2RI-1057 2) SG sample lines • 2RITS-5854 • 2RITS-5864 3) Condenser off gas • 2RITS-0645 4) Secondary Systems Radiation Trend recorder • 2RR-1057 C. SG Tube Leak N-16 monitor history trends. D. 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. E. Steam flow and FW flow prior to Reactor trip.

Procedure Note:

- **Goal is to isolate leaking SG within 30 minutes of procedure entry to limit off-site release.**
- **535°F T_H corresponds approximately to SG pressure of 925 psia (forced circ) or 700 psia (natural circ).**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8
Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.		

Time	Position	Applicant's Actions or Behavior
	ATC	■14. Continue controlled cooldown to less than 535°F TH as follows: A. Reset Low SG Pressure setpoint during cooldown and depressurization. B. Check ANY RCP running. • Maintain RCS pressure within 100 psia above minimum RCP NPSH requirements, refer to 2202.010, Attachment 1, P-T Limits. C. Initiate RCS cooldown using SDBCS Bypass valves or ADVs. D. Notify Chemistry to monitor RDACS for offsite dose releases. E. Check SG Blowdown aligned to SU/BD DI.

Procedure Note:

SG with highest leakage or activity is considered the ruptured SG.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	ANY	15. Determine ruptured SG by comparing 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.
	SRO	■16. 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.
Cue: If contacted as the AO then report after 5 min that the local portions of Attachment 10 for ‘B’ S/G are complete. Cue: When contacted as NLO to perform Att. 19, respond as requested.		
	BOP	17. Isolate ruptured SG Steam Supply to EFW pump 2P7A as follows:

Procedure Note:

A rise in SG level when feeding with AFW Pump 2P75 or EFW Pump 2P7B is confirmation of feed capability.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
	BOP	A. Verify EITHER of the following running and capable of feeding SGs: • EFW Pump 2P7B (refer to 2202.010 Attachment 46, Establishing EFW Flow.)
		Procedure Note: If offsite power available, use of AFW to control SG levels is preferred to minimize waste water production.
	BOP	• AFW Pump 2P75 using 2202.010 Attachment 52, Establishing AFW Flow.
	BOP	B. Stop EFW pump 2P7A as follows: 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: • "Main Steam to EFW Turb 2K03” 2CV-1000-1 • "Main Steam to EFW Turb 2K03” 2CV-1050-2
	ANY	18. 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. Check opposite SG does NOT have steam line break. C. WHEN RCS TH less than 535°F, THEN isolate ruptured SG using 2202.010 Attachment 10, SG Isolation. D. Check MSSVs for ruptured SG closed by locally checking individual valve tail pipes for leakage. E. Maintain ruptured SG pressure 1050 psia or less with ONE of the following: • MSIV Bypass valve • Upstream ADV

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 6, 7, & 8

Event Description: ‘A’ Steam Generator Tube leak ramps up from 12 gpm to 100 gpm over 5 min causes Reactor Trip, ‘A’ Main Feed water line breaks inside containment, and Red Train Containment Spray pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
		Examiner Note: The crew may also elect to isolate the SG earlier using floating step 31 from HR-2. ■ 31. Isolate most affected SG using 2202.010 Attachment 10, SG Isolation. • IF affected SG still pressurized, THEN check MSSVs for affected SG closed by locally checking individual valve tail pipes for leakage.
Control Room actions for 2202.010 Standard Attachment 10	BOP	2. Verify each component in the following table in the indicated position:

TABLE 1

COMPONENT DESCRIPTION	NUMBER	LOCATION	POSITION	√
ADV UPSTRM ISOL	2CV-1002*	2C02	CLOSED (1)	
2CV-1001 PERMISSIVE	2CV-1001	2C02	OFF (1)	
MSIV HEADER #1	2SV-1010-1A	2C17	CLOSED	
MSIV HEADER #1	2SV-1010-2A	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.

Critical Task: The crew must isolate ‘A’ SG (2202.010 Attachment 10 completed) within 1 hour after the Reactor trip.

Termination criteria: RCS PT limits maintained or restored and ‘A’ SG isolated or at the discretion of the lead examiner.

11.0 RAISING SAFETY INJECTION TANK PRESSURE

NOTE

If raising SIT level or pressure prior to/or during plant heatup, then SIT levels should be high and pressures low in operability band to ensure low level, high pressure condition will not be created when SITs heatup.

11.1 Verify HP Nitrogen Supply aligned with N_2 regulator set at desired pressure using N2 System Operations (2104.009), Exhibit 7, Nitrogen Manifold Operations.

11.2 Open Supply Header to Containment Isolation 2CV-6207-2 (2HS-6207-2).

{4.3.3}

CAUTION

Cross-connecting SITs via nitrogen supply valves in Modes 1, 2 and 3 (with RCS pressure greater than or equal to 700 psia) will cause associated SITs to be inoperable.

11.3 IF desired to raise pressure in SIT (2T-2A), THEN perform the following:

CRITICAL STEP

11.3.1 Open N_2 Supply valves 2SV-5005A/B (2HS-5005).

11.3.2 WHEN 2T-2A at desired pressure, THEN close N_2 Supply valves 2SV-5005A/B (2HS-5005).

11.4 IF desired to raise pressure in SIT (2T-2B), THEN perform the following:

CRITICAL STEP

11.4.1 Open N_2 Supply valves 2SV-5025A/B (2HS-5025).

11.4.2 WHEN 2T-2B at desired pressure, THEN close N_2 Supply valves 2SV-5025A/B (2HS-5025).

11.5 IF desired to raise pressure in SIT (2T-2C), THEN perform the following:

CRITICAL STEP

11.5.1 Open N_2 Supply valves 2SV-5045A/B (2HS-5045).

11.5.2 WHEN 2T-2C at desired pressure, THEN close N_2 Supply valves 2SV-5045A/B (2HS-5045).

11.6 IF desired to raise pressure in SIT (2T-2D), THEN perform the following:

CRITICAL STEP

11.6.1 Open N_2 Supply valves 2SV-5065A/B (2HS-5065).

11.6.2 WHEN 2T-2D at desired pressure, THEN close N_2 Supply valves 2SV-5065A/B (2HS-5065).

11.7 Close Supply Header to Containment Isolation 2CV-6207-2 (2HS-6207-2).

11.8 Verify HP N_2 from Unit 1 secured IAW N2 System Operations (2104.009), Exhibit 7, Nitrogen Manifold Operations.

ANNUNCIATOR 2K07

B-3

SIT PRESS LO

1.0 CAUSES

1.1 ANY Safety Injection Tank pressure < 606 psig

- SIT 2T-2A (2PIS-5011)
- SIT 2T-2B (2PIS-5031)
- SIT 2T-2C (2PIS-5051)
- SIT 2T-2D (2PIS-5071)

2.0 ACTION REQUIRED

2.1 Determine affected SIT.

2.2 Check affected SIT level.

2.3 Restore SIT pressure by pressurizing with N2 or adding inventory IAW Safety Injection Tank Operations (2104.001).

3.0 TO CLEAR ALARM

3.1 Raise SIT pressure greater than 606 psig.

4.0 REFERENCES

4.1 E-2455-3

Unit 2 Shift Relief Sheet

Computer Generated Form (1015.016)

Date: Today	Shift: Days	Crew: Yours
Plant Power: ~100%	Plant Mode: 1	Days On Line: 250
Protected Train: (per COPD-013 Att. L) **GREEN**	Current Risk: Minimal	Scheduled Risk: Minimal

Reactivity Control Parameters

RCS Dilution Shift Total	60	Gallons	Dilution Batch Volume	20	Gallons	EFPD	250	RCS Boron 873 PPM
RCS Boration Shift Total	0	Gallons	Boration Batch Volume	5	Gallons			PZR Boron 874 PPM
Next Expected Boration/ Dilution	N/A	Approximate Boration for Power Reduction		90% 1 hour 234 gal (4 gpm)	80% 2 hours 395 gal (4 gpm)	70% 1.25 hours 651 gal (11 gpm)	60% 2 hours 751 gal (9 gpm)	20% 2 hours 1387 gal (16 gpm)
1 hour Shutdown			BAMT Gravity Feed with dilution			1 Charging pump 4 gpm	2 Charging pumps 42 gpm	3 Charging Pumps 79 gpm
2 hour Shutdown			RWT Gravity Feed with dilution			1 Charging pump N/A	2 Charging pumps 14 gpm	3 Charging pumps 43 gpm

SPECIFICATIONS IN EFFECT: {include date / time when LCO entered and limiting action}	Entered:	Time clock:	Due date
• None			
•			

INDEFINITE/CONDITIONAL:	Post RX Trip Contingencies
• None	•

CONTROL ROOM ALARM STATUS:

- 2K-07-B3 SIT pressure low

EVOLUTIONS IN PROGRESS (List continuous action steps, parameters being monitored, frequency, and individual responsible as applicable)

- None.

EVOLUTIONS COMPLETED	EVOLUTIONS SCHEDULED
• Pumped RDT • HWMU to 12 GPM • •	• Add N2 to 'A' Safety injection tank using 2104.001 section 11. NLO is standing by to align Nitrogen. •

COMPONENTS AFFECTING EOOS	PROTECTED EQUIPMENT
• None •	• **GREEN** Train IAW COPD-013 Att. L •

EQUIPMENT CONFIGURATION CONTROL CHANGES: (past 12 hours)

Configuration Control	Tagging	Category E	Containment Pen.	Caution Tags
None	None	None	None	None

Unit 2 Shift Relief Sheet

Computer Generated Form (1015.016)

CARRYOVER ITEMS:
•

WMC COMMUNICATIONS:
•

DELAYED SURVEILLANCES / EVOLUTIONS / WORK PLANS:						
Procedure and Work Order Number	Status of procedure	Location	Reason	Due Date	Late date	Owner
•						
•						
•						

NEW INSTRUCTIONS/PROCEDURE CHANGES	(A)(1) System(s) http://www.ano.entergy.com/a1rule/index.HTM
•	AAC, SDC, HPSI, Transformers, FWCS

CHEMISTRY / RADIOLOGICAL PROTECTION:
•

OTHER UNIT IMPACT
•

UNIT TWO Operator Work-Arounds/ OPS Burdens:
Operator Burdens (online): • **Operator Burdens (outage):** •

Use the following list as a place keeping tool for review of items for shift turnover. Check off the items applicable to your watch station.
Review appropriate index on first day back and then use the past 12 hour section.

Standing orders (ALL)		Board Walk down (SM,CRS,STA,RO)	
TS/TRM/ODCM/ Review (ALL)		Review Annunciator OOS Log (SM,CRS,STA,RO)	
Clearance/ Caution Tagout Review (ALL)		Review OPS-B38 (Nightshift only) (RO, CRS)	
Category E Valve Log (ALL)		Maintenance Schedule (SM,CRS)	
Configuration Control (ALL)		Current SWYD/Transformer Yard Impact (SM, CRS)	
Status Board (ALL)		EN-OP-104 section 5.6 review (SM)	
Temporary Modification Log (ALL)		Key Log and Key Cabinet Key (SM)	
Station Log Review (ALL)		Verify Work Request for the prior shift reviewed (SM)	
Review Procedures in progress (ALL)		Pager/VOIP phone turnover(SM,STA)	
Verification of Plateau quals (at beginning of each work week) (ALL)		Watch stander review of OOS logs (RO, NLO)	
Review ODMI's (at beginning of each work week) (ALL)		Key Ring (RO, NLO)	

Facility: ANO-2 Scenario No.: 2 (New) Op-Test No.: 2015-1

Examiners: ______________ Operators: ______________

Initial Conditions: 100%, 250 EFPD. 'B' Pressurizer pressure and level aligned to 'B' channel and 2P-89C aligned to green.

Turnover: Red Train Maintenance Week. EOOS indicates 'Minimal Risk'.

Evolution scheduled: Unload and secure #1 EDG using OP-2104.036, Emergency Diesel Generator Operations.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP) N (SRO) TS (SRO)	Unload and secure #1 EDG. **OP-2104.036, Emergency Diesel Generator Operations.**
2	CVC4817DEM	I (ATC) I (SRO)	Letdown flow controller auto signal drifts high. **OP-2203.012L Annunciator 2K12 Corrective Action (ACA).**
3	FW2P8BSS	C (BOP) C (SRO)	'B' Heater Drain pump shaft shear inside the casing. **OP-2203.012C Annunciator 2K03 Corrective Action.**
4	CVC2P36CFAL	C (ATC) C (SRO)	2P-36C charging pump breaker trip. **OP-2203.036, Loss of Charging AOP**
5	DI_HS_3810_2 K13-C03	C (BOP) C (SRO)	'A' Main chiller trip. **OP-2203.012M Annunciator 2K13 Corrective Action (ACA).**
6	CV0252	C (ATC) C (SRO) TS (SRO)	Turbine Control Valve fails closed. **OP-2203.024 Loss of Turbine Load AOP.**
7	ESFMSIS1I	M (All)	Inadvertent Red train Main Steam Isolation Signal causing a reactor trip. **OP-2202.001, Standard Post Trip Actions (SPTAs) EOP**
8	RCSLOCATHB	M (All)	Loss of Coolant accident. **OP-2202.003, Loss of Coolant Accident EOP.**
9	SIS2P89BDEG ESFK311AAF	C (BOP) C (SRO)	2P-89B Motor overload. 2CV-5035-1 High pressure safety injection and 2CV-5037-1 Low pressure safety injection valves fail to open. **OP-2202.010 Standard Attachments EOP and OP-2203.012E 2K05 ACA.**
10	ESFCCAS2	C (BOP) C (SRO)	Green train Containment Cooling fails to actuate. **OP-2202.010 Standard Attachments EOP**
End point			RCS cooldown in progress and Margin to Saturation > 30 degrees.

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

Target Quantitative Attributes (Section D.5.d)	Actual Attributes
Malfunctions after EOP entry (1-2)	2
Abnormal Events (2-4)	4
Major Transients (1-2)	2
EOPs entered requiring substantive actions (1-2)	1
EOP contingencies requiring substantive actions (0-1)	0
Critical Tasks (2-3)	3

Critical Task	Justification	
Commence an RCS cooldown within 30 minutes of entry into OP-2202.003, LOCA EOP.	Cooling down and depressurizing the RCS removes decay heat and lowers the DP at the break, slowing the leak rate and reducing makeup volume required. SDC entry conditions are also required for long-term cooling.	• CE EPGB Simulator CTs: CT-20, Cool down and depressurize RCS (LOCA-09) • CR-ANO-2-2010-948, Critical task criteria
Perform one or more of the following to maintain OR restore Margin to Saturation (MTS) > 30 degrees F. • Start a Green train HPSI pump 2P-89C • Throttle open red train HPSI valve 2CV-5035-1. If MTS lowers < 30 degrees F, it must be restored >30 degrees F within 10 min.	SI flow keeps the core covered, cooled, and borated. Inadequate SI flow could result in a net loss of RCS inventory, pressure control, and subcooling. Once subcooling is lost, pressurizer level is no longer a valid indication of RCS mass inventory, and a reactor head void can form, both of which complicate the event recovery. RCP operating limits require MTS to be >30^{0}F.	• CE EPGB Simulator CTs: CT-16, Establish required SI flow (LOCA-02) • 1015.050 Time Critical Operation Actions, Attachment C
Establish RCS pressure control to maintain RCS subcooling. After the HPSI failures have been addressed and MTS restored to >30 degrees F then maintain pressure and temperature within the PT limits of <200^0 F and >30^{0}F MTS throughout implementation of OP-2202.003, LOCA EOP.	Once RCS subcooling is lost, PZR level is no longer a valid indication of RCS inventory. A reactor head void can form, and if left uncontrolled, could result in core uncovery and fuel damage.	• CE EPGB Simulator CTs: CT-06, Establish RCS Pressure Control (LOCA-12)

Scenario #2 Objectives

1) Evaluate individual ability to unload and secure #1 Emergency Diesel Generator.
2) Evaluate individual response to a Heater Drain Pump shaft shear.
3) Evaluate individual response to a Charging pump trip.
4) Evaluate individual response to a Loss of a Main Chiller.
5) Evaluate individual response to a failure of a Letdown flow controller.
6) Evaluate a crew's response to turbine control valve failing closed.
7) Evaluate a crew's response to an inadvertent Main Steam Isolation Signal Actuation.
8) Evaluate crew ability to mitigate a LOCA.
9) Evaluate individual response to Safety Injection valve and pump failures.
10) Evaluate individual response to Containment cooling failures.

SCENARIO #2 NARRATIVE

Simulator session begins with the plant at 100% power steady state. The BOP will unload and secure the #1 Emergency Diesel Generator. The SRO will have to enter TS 3.8.1.1 action b and TS 3.4.4 action b.

When the #1 EDG is secured and the SRO has entered the appropriate TS or when cued by the lead examiner, the letdown flow controller signal will drift high. This will cause elevated letdown flow. The ATC should recognize elevated letdown flow. The ATC should take manual control of the letdown flow controller and adjust letdown to restore PZR level near setpoint. The crew should follow up with the Annunciator corrective action. Not credited as an abnormal event since they may take action prior to alarm annunciation.

After the ATC has control of letdown flow and is restoring PZR level to setpoint, and cued by the lead examiner, 2P-8B Heater Drain pump shaft will shear. The BOP will report alarms for low flow and differential pressure on 2P-8B Heater Drain pump. The SRO should refer to the Annunciator Corrective Action and direct the BOP's actions. The BOP should investigate and determine that flow and differential pressure indicate zero. The BOP should secure 2P-8B and reduce turbine load as necessary to reactor power less than 100%. [Site OE: CR-ANO-1-2012-864, Unit 1 Service water pump shaft shear, CR-ANO-1-2013-2745, Heater drain pump degradation and failure.]

When the 'B' Heater Drain Pump has been secured and power is stabilized <100% and cued by the lead examiner, 'C' Charging pump will trip. The SRO will enter the Loss of Charging AOP. The ATC will check for a suction source and discharge flow path. The ATC will then start a backup charging pump by moving the lead charging pump selector switch. [Site OE: CR-ANO-2-2015-0432, 2P-36A charging pump stopped running, CR-ANO-2-2001-0685, 2P-36C tripped.]

When a backup charging pump is in service or cued by the lead examiner, A Main Chiller will trip. This will cause alarms on 2K-13 in the back of the control room. The BOP should assess the alarms using the Annunciator Corrective Action and direct a NLO to investigate. The loss of the Main Chiller will cause a loss of cooling to the control element drives and the Containment building coolers. The BOP should align Service Water to B Main Chiller and direct the NLO to start the 'B' Main Chiller.

After the BOP has aligned the 'B' Main Chiller and directed a NLO to start a Main chiller, or cued by lead examiner, #4 turbine control valve will fail closed. This will lower steam flow, raise steam pressure, raise RCS temperature and lower reactor power. The crew should recognize the signs of load rejection and determine that #4 control valve (#4CV) has failed closed. The SRO will enter OP-2203.024, Loss of Turbine Load AOP. The ATC will commence normal boration to lower Tave to Tref. The crew should contact a NLO to determine the reason control valve #4 CV has failed. The SRO should enter TS 3.2.6 due to Tcold being out band high. The crew should contact I&C to fail #4 CV closed to prevent it from opening. [Site OE: CR-ANO-2-2009-109, Turbine Control Valve failed closed during power ascension.]

SCENARIO #2 NARRATIVE (continued)

After, the ATC has completed the required reactivity manipulation and cued by the lead examiner, an Inadvertent red train Main Steam Isolation Signal (MSIS) will occur. The MSIS will close the MSIVs, trip the Main Feedwater pumps, and Condensate pumps. RCS pressure will rise causing an automatic plant trip if the crew does not manually trip the reactor. [Site OE: CR-ANO-2-2013-005, Inadvertent SIAS, CIAS, and CCAS.]

The crew will implement OP-2202.001, Standard Post Trip Actions (SPTA) EOP. The crew will assess safety functions. The crew should recognize the signs of LOCA and actuate Safety Injection Actuation Signal (SIAS) and Containment Cooling Actuation Signal (CCAS) and the SRO should diagnose and enter OP-2202.003, Loss of Coolant Accident EOP. The BOP should recognize that two Safety Injection valves failed to open and open them. The 'B' High Pressure Safety Injection (HPSI) pump motor will degrade and the BOP should secure the 'B' HPSI pump. They should also start the swing HPSI pump 2P-89C. The BOP should also recognize that green train Containment Cooling did not actuate as designed and place the green train containment coolers in emergency mode. After the crew has entered the LOCA EOP, the crew will commence a cooldown. [Industry OE: SEN-220, SEN-216, & SEN-182, RCS leakage events.]

Simulator Instructions for Scenario 2

'B' channel pressurizer pressure and level controllers are in service. 2P-89C aligned to green.
T1, T2, T3, T4, T5, T6 T7 & T8 set to false.
T7 = Reactor Trip

Event No.	Malf. No.	Value/ Ramp Time	Event Description
1			Unload and secure #1 EDG. **OP-2104.029, Service Water System Operations.**
2	CVC4817DEM **Trigger 1**	100 / 4 min.	Letdown flow controller auto signal drifts high. **OP-2203.012L Annunciator 2K12 Corrective Action (ACA).**
3	FW2P8BSS **Trigger 2**	active	'B' Heater Drain pump Shaft Shear inside the casing. **OP-2203.012C Annunciator 2K03 Corrective Action.**
4	CVC2P36CFAL **Trigger 3**	active	2P-36C charging pump breaker trip. **OP-2203.028, Pressurizer System Malfunction AOP**
5	DI_HS_3810_2 K13-C03 **Trigger 4**	Active On / delete in = 2 sec.	'A' Main chiller trip. **OP-2203.012M Annunciator Corrective Action.**
6	CV0252 **Trigger 5**	0	Turbine Control Valve fails closed. **OP-2203.024 Loss of Turbine Load.**
7	ESFMSIS1I **Trigger 6**	active	Inadvertent Red train Main Steam Isolation Signal causing a reactor trip. **OP-2202.001, Standard Post Trip Actions (SPTAs) EOP**
8	RCSLOCATHB **Trigger 7**	200 gpm/ 10 min. Delay = 1 min.	Loss of Coolant accident. **OP-2202.003, Loss of Coolant Accident.**
9	SIS2P89BDEG **Trigger 8** ESFK311AAF	10 min. active	2P-89B Motor overload. 2CV-5035-1 High pressure safety injection and 2CV-5037-1 Low pressure safety injection valves fail to open. **OP-2202.010 Standard Attachments EOP.**
10	ESFCCAS2	active	Green train Containment Cooling fails to actuate. **OP-2202.010 Standard Attachments EOP**

Simulator Operator CUEs		
At T=0		Unload and secure #1 EDG.
Cue: If contacted as a NLO that the control room is going to secure #1 EDG then acknowledge the communication. **Cue: If contacted as Unit 1 to take action for EDG inoperability, then state you will take the appropriate actions identified in attachment B of Control room emergency air conditioning and ventilation procedure (2104.007).** **Cue: If contacted as NLO to verify the standby lube oil pump and coolant circulation pump are running then report that they have auto started and running sat.** **Cue: When contacted as a NLO to perform air roll, then cause the starting air trouble alarm to come in and clear, then report step 13.9 is complete.**		
Cued by lead examiner	Trigger T1	Letdown flow controller auto signal drifts high.
Cue: if requested to report CCW flow to the letdown heat exchanger, then report flow is ~ 200 gpm. **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 T2	‘B’ Heater Drain pump Shaft Shear inside the casing.
Cue: If contacted as a NLO to investigate 2P-8B, after 2 min. report that the pump looks normal from the outside but has no DP and is much quieter than normal. **Cue: If contacted as a NLO to perform post stop check of 2P-8B then report that post stop checks are Sat.**		
Cued by lead examiner	Trigger T3	2P-36C charging pump breaker trip.
Cue: If requested as a NLO to investigate 2P-36C, then after approximately 1 min report an acrid odor no fire or smoke present. **Cue: If requested as a NLO to investigate 2P-36C breaker, then after approximately 1 min report that 2B-54 A4 breaker is tripped.** **Cue: If requested as a NLO to vent 2P-36C, then after 1 min report solid stream of water from the vent valve.**		
Cued by lead examiner	Trigger T4	‘A’ Main chiller trip.
Cue: If contacted as the NLO to investigate ‘A’ Main Chiller, after ~ 1 min. report that ‘A’ Main Chiller does not have any power. **Cue: If requested as a NLO to check ‘A’ Main Chiller breaker, after ~ 1 min. report that the ‘B’ phase overcurrent relay is tripped and there is an acrid odor also the report the relay glass has black soot on the relay glass.** **Cue: When contacted as the NLO to perform step 1, after 1 min. report that the oil pump hand switch is in AUTO, The SLIDE STOP in AUTO, SEP oil temperature greater than 60^{0}F, SLIDE VALVE in AUTO, SLIDE VALVE position is less than 9% and the Emergency St0p Button is not depressed.** **Cue: When contacted as the NLO to verify the chilled water flow, after 1 min report flow ~1400 gpm.** **Cue: When contacted as the WWM, then report that Electrical will begin troubleshooting ‘A’ Main Chiller.**		
Cued by lead examiner	Trigger T5	Turbine Control Valve fails closed.

Cue: If asked, report that the MTG #4 CV indicates closed by local verification and If ask, report that the wires for the connector to the servo for # 4 CV are broken off and hanging to the side. Cue: If requested as the WWM, then report that I&C will come to the Control Room to assist in failing #4 Main Turbine Generator Control valve closed. Cue: If requested, after 5 minutes have the communicator enter the simulator control room and perform as requested by the crew. Cue: If requested as I&C after ~ 5 min. come to the control room and respond as requested. Cue: If requested as the Shift Manager to authorize the T-Mod to lift leads for the control valve give authorization to perform the T-Mod. Cue: If the crew determines to pull the leads, then have a controller provide them with a cue to pull the leads as follows. When then find the correct cabinet, ask how they are going to perform the task and when they have described it properly then cue them that the leads are lifted for #4 turbine control valve.		
	Trigger T6	Inadvertent Red train Main Steam Isolation Signal causing a reactor trip.
Cue: If contacted as the STA to report to the control room, acknowledge the request. Cue: If contacted as a NLO to perform Attachment 47 Field Operator Post Trip Actions, acknowledge request.		
	Trigger T7	Loss of Coolant accident.
Tigger when loca is entered.		2P-89B Motor overload.
Cue: If requested as a NLO to check 2A-406 current draw, then after ~ 1min. report that amps on one of the following phases. If requested all phases report all phases. Phase A: 108 amps, Phase B: 103 amps, Phase C: 109 amps and rising. After 2 min. call back and report amps are ~ 152 amps and rising. If requested for all three phases report the following. Phase A: 152 amps, Phase B: 148 amps, Phase C: 155 amps and all phases are still rising.		
		2CV-5035-1 High pressure safety injection and 2CV-5037-1 Low pressure safety injection valves fail to open.
		Green train Containment Cooling fails to actuate.

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 1
Event Description: Unload and secure #1 EDG.		

Time	Position	Applicant's Actions or Behavior
Procedure caution: EDG may trip due to anti-motoring if opening 2A-308 is delayed at 100 KW load.		
	BOP	B. WHEN 5 minutes time has elapsed at 1400 KW, THEN perform the following: 1. Reduce load to approximately 100 KW. 2. Open 2DG1 Output breaker 2A-308 (152-308 CS).
Cue: If contacted as a NLO that the control room is going to secure #1 EDG then acknowledge the communication.		
	BOP	13.3.2 IF 2DG1 post maintenance testing run in progress, THEN unload as follows using Governor Control Switch (CS 4): **Examiner Note: Step 13.3.2 is N/A.**
	BOP	13.4 Verify the following 2DG1 parameters: • Frequency approximately 60 Hz, using Governor Control switch (CS 4). • Voltage approximately 4160 volts, using Voltage Control switch (CS 3).
	SRO	13.5 Perform the following administrative actions: 13.5.1 Verify Unit 1 has taken appropriate actions as identified in Attachment B of Control Room Emergency Air Conditioning and Ventilation (2104.007). 13.5.2 Verify entry into TS 3.8.1.1, 3.8.1.2, and 3.4.4 as applicable. **Examiner Note: The SRO must enter TS 3.8.1.1 action b and TS 3.4.4**
Cue: If contacted as Unit 1 to take action for EDG inoperability, then state you will take the appropriate actions identified in attachment B of Control room emergency air conditioning and ventilation procedure (2104.007).		
	SRO	13.5.3 Declare Diesel Engine inoperable due to START handswitch in STOP (energizes Shutdown 5 relay for 60 seconds which blocks Engine auto start).
Procedure Note: Expect annunciator 2DG1 NOT AVAIL (2K08-F1) when stopping 2DG1.		
	BOP	13.6 Secure 2DG1 by placing Engine Start switch (2HS-2809-1) in STOP.

Op-Test No.: 2015-1 Scenario No.: 2 Event No.: 1

Event Description: Unload and secure #1 EDG.

Time	Position	Applicant's Actions or Behavior
	BOP	13.7 WHEN 2DG1 NOT AVAIL (2K08-F1) alarm clear, THEN EDG may be declared OPERABLE.
	BOP	13.8 Check the following pumps auto start: • Standby Lube Oil Circulating pump (2P-171A) • Standby Coolant System Circulating pump (2P-167A)
Cue: If contacted as NLO to verify the standby lube oil pump and coolant circulation pump are running then report that they have auto started and running sat.		
Examiner Note: Do not wait until the air roll is complete to move to the next event. Proceed with the next event and the crew may or may not continue with the air roll later in the scenario.		
Procedure Caution: If DC control power to Engine Governor NOT available, the engine will start when air rolled unless overspeed trip mechanism is tripped with Emergency Stop pushbutton.		
Procedure Note: The air roll of the EDG may be N/A'ed or delayed with the concurrence of System Engineering and the OPS Manager.		
	BOP	13.9 Perform the following to air roll 2DG1: 13.9.1 Verify engine shutdown greater than 15 minutes.
	SRO	13.9.2 Perform the following for EDG inoperability: A. Verify Unit 1 has taken appropriate actions as identified in Attachment B of Control Room Emergency Air Conditioning and Ventilation (2104.007). B. Verify entry into TS 3.8.1.1, 3.8.1.2, and 3.4.4 as applicable. C. Declare Diesel Engine inoperable due to Local Engine Control switch in LOCKOUT. **Examiner Note: SRO must enter TS 3.8.1.1 action b and TS 3.4.4**
	BOP	Direct a NLO to perform an Air roll IAW with step 13.9.
Cue: When contacted as a NLO to perform air roll, then cause the starting air trouble alarm to come in and clear, then report step 13.9 is complete.		

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 1

Event Description: Unload and secure #1 EDG.

Time	Position	Applicant's Actions or Behavior
	SRO	13.10 WHEN ALL of the following are complete: • Engine Control switch in AUTO. • Engine Control switch key removed. • 2DG1 NOT AVAIL (2K08-F1) alarm clear. • All alarms concerning 2DG1 cleared OR any concern raised by alarms is resolved. • IF Engine Air roll will be performed, THEN verify Engine Air roll completed. THEN 2DG1 may be declared OPERABLE.

Termination criteria: When the #1 EDG is secured and the SRO has entered the appropriate TS or at lead examiner's discretion.

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 2
Event Description: Letdown flow controller auto signal drifts high.		

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.**		
	ATC	Implement Annunciator corrective actions as necessary for 2K-12.
2K-12 B1	ANY	2.1 Check the following indications: • Regen HX Temp To LD (2TI-4820) • Computer Point C&VCS LD LINE ISOLATION VLV (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 Letdown Flow controller (2HIC-4817) in MANUAL. 2.2.2 Stabilize flow.
2K-12 C1	ANY	2.1 Check the following indications: • Regen HX Temp To LD (2TI-4820) • Computer Point C&VCS LD LINE ISOLATION VLV (T4820)
	ATC	2.2 Verify letdown flow (2FIS-4801) within 10 gpm of charging flow (2FIS-4863). Refer to Chemical and Volume Control (2104.002). 2.3 Locally verify CCW flow through Letdown Heat Exchanger (2FIS-526l). **Examiner Note: The ATC will be required to control letdown in manual for until completion of the drill.**
Cue: if requested to report CCW flow to the letdown heat exchanger, then report flow is ~ 200 gpm.		
2K-12 F1	ANY	2.1 Check the following indications: • Letdown HX Outlet Flow (2FIS-4801) • Computer Point C&VCS LD HX LETDOWN FLOW (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 Letdown Flow controller (2HIC-4817) in MANUAL. 2.2.2 Reduce flow to less than 128 gpm.

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 2
Event Description: Letdown flow controller auto signal drifts high.		

Time	Position	Applicant's Actions or Behavior
	SRO	Contact Work Week Manager to repair 2HIC-4817.
	ATC	Implement Annunciator corrective actions 2K-12 J1.
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 level instrument.		
Termination Criteria: Letdown being controlled in manual or at lead examiner's discretion.		

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 3
Event Description: 'B' Heater Drain pump Shaft Shear inside the casing.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Announce annunciators: 2K03-D7 2P-8B ΔP HI/LO. 2K03 F7 2P-8B ΔP DISCH FLOW LO
	BOP	BOP should recognize that 2P-8B has zero flow and zero ΔP.
	SRO/BOP	Implement 2203.012C Annunciator 2K-03 D7 Corrective Action.
Cue: If contacted as a NLO to investigate 2P-8B, after 2 min. report that the pump looks normal from the outside but has no DP and is much quieter than normal.		
2K03 D7 actions	BOP	2.1 Check HDP 2P-8B Differential pressure (2PDIS-0723).
	BOP	2.2 Check HDP 2P-8B Discharge flow (2FIS-0723).
	SRO/BOP	2.3 IF 2P-8B Differential pressure and Discharge flow normal for plant conditions, THEN no further action required.
Procedure Note: At full power operation, securing a Heater Drain pump will result in a Reactor power rise (~ 0.15%) and a lowered megawatt output (~ 30 MW). Depending on time in core life, Reactor power change may be slightly higher (end of life) or slightly lower (beginning of life) than 0.15%.		
2K03 D7 actions	BOP/ATC	Maintain power less than 100%
	BOP	2.4 IF High ΔP alarm in for greater than seven seconds, THEN perform the following: **Examiner Note: High ΔP alarm will not be in.**
	BOP	2.5 Check proper operation of 2P-8B Recirc (2CV-0719) IAW Attachment A.3 of Conduct of Operations (1015.001).
	BOP	3.0 TO CLEAR ALARM 3.2 Secure Heater Drain Pump 2P-8B (2HS-0720).
	SRO/BOP	Implement 2203.012C Annunciator 2K-03 F7 Corrective Action.
Procedure Note: Heater Drain pump flow indication does not account for pump recirc flow. If recirc valve open and pump ΔP normal, then pump has adequate flow.		

Op-Test No.: 2015-1 Scenario No.: 2 Event No.: 3

Event Description: ‘B’ Heater Drain pump Shaft Shear inside the casing.

Time	Position	Applicant's Actions or Behavior
	BOP	2.1 IF BOTH of the following conditions apply: • 2P-8B Recirc (2CV-0719) open • Pump ∆P NOT in alarm (2K03-D7) THEN no further action required.
	BOP	2.2 Check proper operation of 2P-8B Recirc (2CV-0719) IAW Attachment A.3 of Conduct of Operations (1015.001).
Procedure Note: At full power operation, securing a Heater Drain pump will result in a Reactor power rise (~ 0.15%) and a lowered megawatt output (~ 30 MW). Depending on time in core life, Reactor power change may be slightly higher (end of life) or slightly lower (beginning of life) than 0.15%.		
	BOP	2.3 IF actual flow can not be raised greater than 1200 gpm, THEN perform the following: 2.3.1 Secure 2P-8B using Condensate and Feedwater Operations (2106.016).
	BOP/ATC	2.3.2 Verify Reactor power less than 100%.
	ANY	2.3.3 IF necessary to maintain MFP suction pressure greater than 450 psig, THEN start standby Condensate pump. Refer to Condensate and Feedwater Operations (2106.016).
	BOP	3.0 TO CLEAR ALARM 3.1 Stop Heater Drain Pump 2P-8B (2HS-0720).
Cue: If contacted as a NLO to perform post stop check of 2P-8B then report that post stop checks are Sat.		
Termination criteria: 2P-8B has been secured and reactor power has been restored/maintained less than 100% or at lead examiner's discretion.		

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 4
Event Description: 2P-36C charging pump breaker trip.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Announce annunciator 2K12-B3 HEADER FLOW LO is due to 'C' Charging pump trip.
	SRO	Enter OP-2203.036, Loss of Charging AOP.
	ATC	1. Check Charging flow path as follows: • Suction source aligned to ANY of the following: - VCT - RWT - BAMT • Charging Header Isolation valve (2CV-4840-2) open.
Cue: If requested as a NLO to investigate 2P-36C, then after approximately 1 min report an acrid odor no fire or smoke present. **Cue: If requested as a NLO to investigate 2P-36C breaker, then after approximately 1 min report that 2B-54 A4 breaker is tripped.**		
	ANY	2. Check BOTH of the following conditions exist: • Lead Charging pump STOPPED **(2P-36C)** • Green indicating light ON
	ATC	2. IF lead Charging pump STOPPED AND green indicating light OFF, THEN restore charging by performing the following: A. Start backup charging pump by selecting a new lead pump using Charging Pumps Select Switch (2HS-4868). B. IF Letdown isolated, THEN restore Letdown using Attachment A, Letdown Restoration.
	ANY	Direct NLO to vent 2P-36C. C. Locally check AFFECTED Charging pump for gas binding using Attachment B, Charging Pump Venting.
Cue: If requested as a NLO to vent 2P-36C, then after 1 min report solid stream of water from the vent valve.		
	ATC	B. IF desired, THEN place AFFECTED Charging pump handswitch in STOP.

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 4
Event Description: 2P-36C charging pump breaker trip.		

Time	Position	Applicant's Actions or Behavior
	BOP	E. IF AFFECTED Charging pump was NOT gas bound, THEN perform the following: 1) Complete actions required for shifting lead charging pumps using Attachment C, Follow Up Actions. 2) Exit this procedure.
Examiner Note: The following steps are actions to align the plant to a normal configuration and are not required to be completed prior to moving to the next event.		
Attachment C actions	BOP/ATC	1. IF CCP Select switch (2HS-4868) NOT selected to lead Charging pump THEN perform the following: **Examiner Note: Step 1 is N/A**

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 4
Event Description: 2P-36C charging pump breaker trip.		

Time	Position	Applicant's Actions or Behavior
Attachment C actions	BOP	2. Perform the following for proper room cooler alignment: A. Stop off-going pump Room cooler: • 2P-36A Room cooler 2VUC-7A (2HS-8461-1) • 2P-36B Room cooler 2VUC-7B (2HS-8462-2) • 2P-36C Room cooler 2VUC-7C (2HS-8463-1) <u>OR</u> (2HS-8464-2) B. Close off-going pump Room cooler Service Water Inlet valve: • 2VUC-7A SW Inlet 2CV-1500-1 (2HS-1500-1) • 2VUC-7B SW Inlet 2CV-1502-2 (2HS-1502-2) • 2VUC-7C SW Inlet 2CV-1501-5 (2HS-1501-1) <u>OR</u> (2HS-1501-2) C. Verify on-coming pump Room cooler in Normal-After-Start: • 2P-36A Rm Cooler 2VUC-7A (2HS-8461-1) • 2P-36B Rm Cooler 2VUC-7B (2HS-8462-2) • 2P-36C Rm Cooler 2VUC-7C (2HS-8463-1) <u>OR</u> (2HS-8464-2) D. Verify on-coming pump Room cooler Service Water Inlet valve open: • 2VUC-7A SW Inlet 2CV-1500-1 (2HS-1500-1) • 2VUC-7B SW Inlet 2CV-1502-2 (2HS-1502-2) • 2VUC-7C SW Inlet 2CV-1501-5 (2HS-1501-1) <u>OR</u> (2HS-1501-2)

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 4
Event Description: 2P-36C charging pump breaker trip.		

Time	Position	Applicant's Actions or Behavior
Attachment C actions		3. Record current RCS boron concentration on Plant Status Board for Charging pump that was secured. 4. WHEN CCP secured greater than 10 minutes, THEN perform the following: A. IF desired to secure Seal Water Pump, THEN place applicable Seal Water Pump handswitch in AUTO: • 2P-36A Seal Water pump 2P-64A (2HS-4862) • 2P-36B Seal Water pump 2P-64B (2HS-4872) • 2P-36C Seal Water pump 2P-64C (2HS-4882) B. IF desired to keep associated Seal Water pump in service, THEN place applicable handswitch in HAND: • 2P-36A Seal Water pump 2P-64A (2HS-4862) • 2P-36B Seal Water pump 2P-64B (2HS-4872) • 2P-36C Seal Water pump 2P-64C (2HS-4882) C. IF Seal Water Pump is placed in HAND, THEN refer to Configuration Control Program (OP-1015.049).
Termination Criteria: A backup charging pump in service or at lead examiner's discretion.		

Op-Test No.: 2015-1 Scenario No.: 2 Event No.: 5

Event Description: 'A' Main chiller trip.

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Announce annunciators: 2K13-A3 Main Chiller 2VCH-1A Trouble. (In and clear) 2K13-C3 Main Chiller 2VCH-1A Overload.
	SRO/BOP	Implement 2K13-A3 Annunciator Corrective Action.
2K13 A3 actions	BOP	Dispatch NLO to investigate the follow items. 2.1 To determine cause of alarm check the following: • RIS 2K1564 (Local) • Alarm Display on 2VCH-1A Control panel (2C121) • 2VCH-1A Remote Starter panel (IQ-1000 Module) 2.2 IF 2VCH-1A tripped OR desired to secure, THEN start 2VCH-1B using Main Chilled Water System (2104.026). 2.3 IF Supply breaker (2A-108) tripped, THEN check 2A-108 breaker cubicle for dropped flag indications.
Cue: If contacted as the NLO to investigate 'A' Main Chiller, after ~ 1 min. report that 'A' Main Chiller does not have any power. **Cue: If requested as a NLO to check 'A' Main Chiller breaker, after ~ 1 min. report that the 'B' phase overcurrent relay is tripped and there is an acrid odor also the report the relay glass has black soot on the relay glass.**		
	BOP	Implement 2K13-C3 Annunciator Corrective Action.
2K13 C3 actions	BOP	2.1 Check current draw for each phase at 2A-108. 2.2 Check breaker 2A-108 for dropped relay flags. 2.3 IF breaker 2A-108 has tripped, THEN perform the following using Main Chilled Water System (2104.026): 2.3.1 Verify Main chiller 2VCH-1A secured. 2.3.2 Start Main chiller 2VCH-1B.
	BOP	Transition to OP-2104.026 Main Chilled Water System to start 'B' Main chiller.

Op-Test No.: 2015-1 Scenario No.: 2 Event No.: 5

Event Description: ‘A’ Main chiller trip.

Time	Position	Applicant's Actions or Behavior
Procedure Note: • Steps 1.0 and 2.0 may be performed concurrently. • Under emergency conditions, cycling the local Main Chiller disconnect open then closed will reset the 10 minute Recycle Delay. Since this defeats an interlock it should not be done without SM permission		
Exhibit 2 Main Chiller trip response	BOP	Direct a NLO to perform the following locally. 1.0 LOCALLY perform the following for Chiller to be STARTED: 1.1 Verify the following at Microcomputer Control Center: • Oil pump hand switch in AUTO • SLIDE STOP in AUTO • SEP oil temperature greater than 60ºF • SLIDE VALVE in AUTO • SLIDE VALVE position less than or equal to 9% 1.2 Verify Emergency Stop Button NOT depressed.
Cue: When contacted as the NLO to perform step 1, after 1 min. report that the oil pump hand switch is in AUTO, The SLIDE STOP in AUTO, SEP oil temperature greater than 60^{0}F, SLIDE VALVE in AUTO, SLIDE VALVE position is less than 9% and the Emergency St0p Button is not depressed.		
	BOP	2.0 IF desired to start a STANDBY chiller, THEN perform the following from the CONTROL ROOM: 2.1 IF desired to start 2VCH-1A, THEN perform the following: **Examiner Note: step 2.1 is N/A due to the chiller tripping.**
	BOP	2.2 IF desired to start 2VCH-1B, THEN perform the following: 2.2.1 Open the following valves • 2VCH-1B Evaporator Inlet 2CV-3807 (2HS-3807) • 2VCH-1B Condenser Inlet 2CV-3808 (2HS-3808) 2.2.2 Close the following valves: • 2VCH-1A Evaporator Inlet 2CV-3805 (2HS-3805) • 2VCH-1A Condenser Inlet 2CV-3806 (2HS-3806)

Op-Test No.: 2015-1 Scenario No.: 2 Event No.: 5

Event Description: ‘A’ Main chiller trip.

Time	Position	Applicant's Actions or Behavior
	BOP	Direct the NLO: 2.3 Verify Chilled Water Flow greater than 500 gpm.
Cue: When contacted as the NLO to verify the chilled water flow, after 1 min report flow ~1400 gpm.		
	BOP	Direct the NLO to perform step 3 to locally start the Main Chiller. 3.0 LOCALLY perform the following for Main Chiller to be STARTED: 3.1 Depress RUN key. 3.2 WHEN Slide Valve position reaches ~15%, THEN depress MANUAL UNLOAD key to place slide valve in manual. **NOTE** Compressor Discharge and Suction Pressure should be monitored closely to prevent High Discharge Pressure Cutout (greater than or equal to 270 psig) or Low Suction Pressure Cutout (less than or equal to 52.7 psig). 3.3 Raise Slide Valve position by increments of ~ 10 % until Chill Water Temperature is ~ 46º F. 3.4 IF auto operation desired, THEN depress Slide Valve AUTO key. 3.5 Verify Power source Selection hand switch on RIS 2K1564 panel selected to the operating chiller (2VCH-1A or 2VCH-1B).
Cue: When contacted as the WWM, then report that Electrical will begin troubleshooting ‘A’ Main Chiller.		
Termination Criteria: When ‘B’ Main Chiller is in service or at lead examiner's discretion.		

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 6
Event Description: Turbine Control Valve fails closed.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Report #4 MTG CV is failed Closed.
	SRO	Enter and direct actions of AOP 2203.024, Loss of Turbine Load.
	SRO	1. Open Placekeeping page. 2. Notify Control Board Operators to monitor floating steps. ■3. Check “Generator Protection Circuit Energized” annunciator (2K02-A4) NOT in alarm. **Examiner Note: Generator Protection Circuit Energized alarm will not be in alarm.**
	ATC	*4. Reduce Reactor power to match TAVE within 2°F of TREF using 2104.003 Exhibit 3, normal boration. **Examiner Note: Loss of Turbine Load AOP is continued on the next page.**
	ATC	Transition to OP-2104.003 Chemical Addition, Exhibit 3, normal boration
Procedure Caution: The following section has been determined to have a Reactivity Addition Potential (RAP) and this activity is classified as a Risk Level R3.		
	ATC	1.0 IF a Reactivity Management Brief has NOT been conducted, THEN perform a Reactivity Management Brief per COPD-030 with an SRO. Examiner Note: This step is N/A due to being in transient standards.
	ATC	2.0 IF this is the first Boration of the shift, THEN verify BAM Flow totalizer (2FQI-4926) reset. 3.0 IF desired, THEN record initial controller data: 2FIC-4926 Setpoint: ____________ Demand: ______________ 4.0 Verify Boric Acid Makeup Flow controller (2FIC-4926) set as follows: • Setpoint set to desired flow rate. • IF in MANUAL, THEN demand set to desired value. 5.0 Verify desired BAM pump (2P-39A OR 2P-39B) selected for automatic operation using BAM pump Select switch (2HS-4911-2). 6.0 Place Mode Select switch (2HS-4928) to BORATE. 7.0 Verify Charging Pump Suction From Boric Acid (2CV-4930) opens (2HS-4930).

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 6
Event Description: Turbine Control Valve fails closed.		

	ATC	8.0 Verify selected BAM pump running: • 2P-39A (2HS-4919-2) • 2P-39B (2HS-4910-2) *9.0 Verify BAM Tank Recirc open for running pumps: • 2T-6A recirc (2HS-4903-2) • 2T-6B recirc (2HS-4915-2)
	ATC	*10.0 <u>IF</u> additional boric acid flow required, <u>THEN</u> manually start additional BAM pump: • 2P-39A (2HS-4919-2) • 2P-39B (2HS-4910-2) **Examiner Note: An additional Boric Acid Makeup pump should not be required.**
	ATC	11.0 Operate Boric Acid Makeup Flow Batch controller (2FQIS-4926) as follows: 11.1 Depress AND hold red pushbutton. 11.2 Verify Boric Acid Makeup Flow Batch controller (2FQIS-4926) set for desired quantity. 11.3 Release Red pushbutton. 12.0 Verify Boric Acid Makeup Flow controller (2FIC-4926) indicates desired flow rate. 13.0 Monitor the following parameters: • RCS T_{AVE} • Axial Shape Index • Reactor power
	SRO	Continue with OP-2203.024 Loss of Turbine Load.
	ANY	*5. Check RCS pressure 2025 to 2275 psia.
Cue: If asked, report that the MTG #4 CV indicates closed by local verification and If ask, report that the wires for the connector to the servo for # 4 CV are broken off and hanging to the side.		
	ANY	*6. Verify SDBCS maintaining SG pressure at setpoint.
	ANY	7. <u>IF</u> Main Turbine has NOT tripped, <u>THEN</u> perform the following: • Re-establish Turbine control on Load Limit Pot. • Refer to TRM 3.3.4, Turbine Overspeed Protection. **Examiner note: Turbine control will be on the load limit Pot.**

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 6
Event Description: Turbine Control Valve fails closed.		
	ANY	■8. IF desired to fail a Turbine Control Valve closed, THEN perform the following: A. IF necessary to maintain valve closed, THEN depress AND maintain depressed the selected Control Valve Test Switch on 2C01. B. Refer to 2106.009, Turbine Generator Operations.
Cue: If requested as the WWM, then report that I&C will come to the Control Room to assist in failing #4 Main Turbine Generator Control valve closed. **Cue: If requested, after 5 minutes have the communicator enter the simulator control room and perform as requested by the crew.** **Cue: If requested as I&C after ~ 5 min. come to the control room and respond as requested.** **Cue: If requested as the Shift Manager to authorize the T-Mod to lift leads for the control valve give authorization to perform the T-Mod.** **Cue: If the crew determines to pull the leads, then have a controller provide them with a cue to pull the leads as follows. When then find the correct cabinet, ask how they are going to perform the task and when they have described it properly then cue them that the leads are lifted for #4 turbine control valve.**		
	ANY	■9. IF ADVs are open, THEN maintain Hotwell level 30% to 90% by performing one of the following: **Examiner Note: Atmospheric Dump valves will not be open and step is N/A**
	ANY	*10. Check RCS T_C 542°F to 554.7°F using CPC PID 5, 6, 160, or 161. **(Not met, perform contingency)**
	SRO	*10. 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.**
Examiner note: The following steps may or may not be completed based on examiner discretion of when the required reactivity manipulation is complete.		
	ANY	*11. Check ASI within limits as specified in Core Operating Limits Report (COLR).
	ANY	*12. 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	*13. Check Reactor NOT tripped.
Procedure Note: PZR level shall not exceed 82% in modes 1, 2 or 3 [less than 67% with instrument uncertainty – (910 ft3) per LI-0099 /2CAN100101]		
	ANY	*15. Check PZR level within 5% of setpoint.

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 6
Event Description: Turbine Control Valve fails closed.		

	SRO	■16. IF Main Turbine tripped, THEN perform the following: **Examiner Note: This step is N/A.**
	ANY	17. Check Condenser pressure less than 5.3 inches Hg Abs. **Examiner Note: This step is N/A.**

Termination criteria: When the ATC has started boration and TS 3.2.6 has been entered or at lead examiner's discretion.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	The crew will recognize the reactor has tripped and commence SPTAs.
	SRO	Enter OP-2202.001, Standard Post Trip Actions EOP.
Examiner Note: After the crew determines that there is a Loss of Coolant Accident occurring they may actuate Safety Injection Actuation Signal (SIAS) and Containment Cooling Actuation Signal (CCAS).		
	SRO	1. Notify Control Board Operators to perform the following: A. Monitor safety functions using Exhibit 7, CBO Reactor Trip Checklist. B. Perform post trip contingencies as required.
	SRO	2. Open Safety Function Tracking page.
Reactivity control Safety Function	ATC	3. Check Reactivity Control established as follows: A. Reactor power lowering. B. Check startup rate is negative. C. ALL CEAs fully inserted by observing ANY of the following:
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.
	BOP	B. Generator Output breakers open.

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 7, & 8

Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.

Time	Position	Applicant's Actions or Behavior
Vital Auxiliaries Safety Function	BOP	C. Perform EITHER of the following as required: 1) Check the following valves closed: • MSR 2E-12A Steam Supply From SG A (2CV-0400) • MSR 2E-12B Steam Supply From SG B (2CV-0460) 2) No flow indicated on the following MSR second stage flow instruments: • 2FI-0402 • 2FI-0462
	BOP	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.
	BOP	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. **(May not be met due to LOCA, perform contingency)** B. RCS MTS 30°F or greater.
RCS Inventory Control Safety Function	SRO	Perform Step 5 Contingency Actions. 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.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

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. **(May not be met due to LOCA Event, perform contingency)** • Normal PZR Spray and heaters controlling pressure. • Valid CNTMT Spray NOT in progress.
	SRO	Perform Step 6 Contingency Actions. 6. Perform as necessary: A. <u>IF</u> RCS pressure lowers to less than 1400 psia, <u>THEN</u> trip ONE RCP in EACH loop. D. <u>IF</u> RCP 2P32A or 2P32B stopped, <u>THEN</u> verify associated PZR Spray valve in MANUAL and closed: • RCP A Spray Valve (2CV-4651) • RCP B Spray Valve (2CV-4652) F. <u>IF</u> RCS pressure lowers to 1650 psia or less, <u>THEN</u> perform the following: 1) Verify SIAS actuated on PPS inserts. 2) **GO TO** Step 7. G. 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. **(If SIAS actuated then, Not Met, Perform Contingency)** F. IF SIAS or MSIS actuated, THEN maintain SW header pressure greater than 85 psig.
Core Heat Removal Safety Function.	SRO	Perform Step 7 Contingency Action. E. <u>IF</u> CCW available, <u>THEN</u> restore SW to CCW, refer to Exhibit 5, CCW/ACW/SW Alignment.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
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 **(Not met, perform contingency)**
	ANY	Perform Step 8.A Contingency Actions when applicable. A. Perform the following: 1) IF SG level lowering, THEN verify EFAS actuated.
	BOP/ATC	B. Check MFW in RTO **(Not Met, Perform contingency)**
	ANY	Perform Step 8.B Contingency Actions. B. Verify EITHER of the following: • BOTH MFW pumps tripped. **(Both MFW pumps will be tripped due to MSIS)** • SG levels controlling at setpoint
	ATC/BOP	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. **Examiner Note: The crew will not have any indication for the feedline due to MSIS tripping all the feedwater pumps.**
	ATC/BOP	D. Check RCS TC 540°F to 555°F **(May not be Met due to MSIS, perform contingencies)**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal Safety Function	ATC/BOP	Perform Step 8.D Contingency Actions. D. Perform as necessary: ___ 1) IF T_C greater than 555º F, THEN perform the following: a) Verify level being restored to at least one SG. b) Verify SDBCS restoring T_C 540°F to 555°F using 2105.008 Exhibit 3, SDBCS Emergency Operation. c) IF SDBCS NOT restoring T_C, THEN check MSSVs operating to control SG pressure 1050 psia to 1100 psia.
	ATC/BOP	E. Check SG pressure 950 to 1050 psia. **(Not Met, perform contingencies)**
	ATC/BOP	Perform Step 8.E Contingency Actions. E. Perform as necessary: 2) Verify SDBCS restoring SG pressure 950 psia to 1050 psia using 2105.008 Exhibit 3, SDBCS Emergency Operation. 4) IF SG pressure greater than 1050 psia, THEN check MSSVs operating to control SG pressure 1050 psia to1100 psia.
	BOP	Implement OP-2105.008, SDBCS Emergency Operations.
Steam Dump Exhibit 3	BOP	1.0 IF BOTH MSIV's closed, THEN GO TO step 5.0. **Examiner Note: MSIVs are closed.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
	BOP	5.0 Perform the following to determine availability of UPSTREAM SDBCS valves: 5.1 IF the following conditions satisfied: • Instrument air available • EMERGENCY OFF (2K02-A14) annunciator clear • Power available to selected controllers/valves, THEN Upstream ADVs are available. 5.2 IF the following conditions satisfied: • EMERGENCY OFF (2K02-A14) clear or Upstream ADV locally failed open • Power available, THEN ADV Upstream Isolation valve(s) are available. **Examiner Note: Upstream ADVs are available.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
Steam Dump Exhibit 3	BOP	6.0 IF operation of Upstream Atmospheric Dump valve from the Control Room desired, THEN perform the following: 6.1 Verify selected HIC in MANUAL with ZERO output demand: • Hdr #1 UPSTM ADV 2CV-1001 (2HIC-1001) • Hdr #2 UPSTM ADV 2CV-1051 (2HIC-1051) 6.2 Place selected valve(s) permissive handswitch in MANUAL: • 2CV-1001 Permissive (2HS-1001) • 2CV-1051 Permissive (2HS-1051) 6.3 IF MSIS actuated, THEN override “MSIS CLOSE” actuation for selected MOV isolation: • ADV Upstream Isolation valve (2CV-1002) • ADV Upstream Isolation valve (2CV-1052) *6.4 Throttle open selected MOV as desired: • ADV Upstream Isolation valve (2CV-1002) • ADV Upstream Isolation valve (2CV-1052) *6.5 Place selected HIC to desired demand: • Hdr #1 UPSTM ADV 2CV-1001 (2HIC-1001) • Hdr #2 UPSTM ADV 2CV-1051 (2HIC-1051)
	SRO	Implement remaining steps from OP-2202.001, Standard Post Trip Actions Steps.
RCS Heat Removal Safety Function	ATC/BOP	F. IF MSIVs open, AND desired, THEN place SDBCS Master Controller in Auto/Local with setpoint of 960 psia using 2105.008 Exhibit 3, SDBCS Emergency Operation. **Examiner Note: MSIVs are not open step is N/A.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
	ANY	9. Check CNTMT parameters: A. Temperature and Pressure: **(May not be met due to LOCA Event. Perform contingency)** • Temperature less than 140°F. • Pressure less than 16 psia.
	ANY	Perform Step 9.A Contingency Actions. A. Perform the following: 1) <u>IF</u> CNTMT pressure less than 18.3 psia, <u>THEN</u> verify ALL available CNTMT Cooling fans running with cooling water aligned.
Containment Safety Function	ANY	B. Check CNTMT Spray pumps secured.
	ANY	C. NO CNTMT radiation alarms or unexplained rise in activity: 1) CAMS alarms: • "CNTMT PART/GAS RAD HI/LO" annunciator (2K10-B6) clear. **(May not be Met)** 2) RCS leakage alarms: • "AREA RADIATION HI/LO" annunciator (2K11-B10) clear. **(Not Met)** • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. 3) Check the following radiation monitors trend stable: • CNTMT Area **(Not Met)** • CAMS • Process Liquid
Containment Safety Function	ANY	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.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
	SRO	10. Notify STA to report to control room. 11. Direct NLOs to perform 2202.010 Attachment 47, Field Operator Post Trip Actions. 12. Verify Reactor trip announced on Plant page. 13. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
Cue: If contacted as the STA to report to the control room, acknowledge the request. **Cue: If contacted as a NLO to perform Attachment 47 Field Operator Post Trip Actions, acknowledge request.**		
	SRO	14. Direct control board operators to acknowledge ALL annunciators and announce ALL critical alarms.
	SRO	15. Check ALL safety function acceptance criteria satisfied. **(All safety functions are not satisfied, perform contingency)**
	SRO	Perform Step 15 Contingency Actions. 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 OP-2202.003, Loss of Coolant Accident EOP.
	SRO	Enter OP-2202.003, Loss of Coolant Accident EOP.

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 7, & 8

Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.

Time	Position	Applicant's Actions or Behavior
	SRO	*1. Confirm diagnosis of LOCA as follows: A. Check SFSC acceptance criteria satisfied every 15 minutes. B. IF CCW in service to provide SG Sample Cooler cooling, THEN perform the following: 1) Verify SG Sample valves open. • 2CV-5852-2 • 2CV-5859-2 • 2CV-5850 • 2CV-5858 2) Notify Chemistry to sample SGs for activity. C. IF SGs indicate primary to secondary leakage within TS limits, THEN continue with this procedure using SG with lowest leak rate for cooldown.
	SRO	*2. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification. 3. Open Placekeeping page. 4. Record present time: Time ____________________
	ANY	5. Verify SIAS and CCAS actuated on PPS inserts.
	ANY	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.
	BOP	Implement OP-2202.010, Exhibit 9 ESFAS Actuation. See events 9 and 10.
	ANY	*7. Verify the following for any operating RCP: A. CSAS NOT actuated. B. Proper seal staging.
	ANY	■8. Check CCW flow aligned to RCPs.
	ANY	■9. Check RCS pressure greater than 1400 psia. **(Not met, but contingencies are already done)**
	ANY	■10. Restore ESF/Non-ESF systems post-SIAS using 2202.010 Attachment 51, Post ESFAS Actuation System Restoration.

Op-Test No.: 2015-1 Scenario No.: 1 Event No.: 7, & 8

Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.

Time	Position	Applicant's Actions or Behavior
	BOP	Perform OP 2202.010, Standard Attachments, Attachment 51 and Exhibit 5. **Examiner Note: The LOCA steps are continued on page 38.**
Attach. 51	BOP	1. Verify at least ONE SW pump running on EACH loop.
Procedure Caution: **Operation of loaded DG without Service Water for greater than three minutes may cause engine damage.**		
Attach. 51	BOP	2. IF ANY EDG in operation, THEN perform the following: A. Check running EDG SW Outlet valve open: • 2DG-1 SW Outlet (2CV-1503-1) • 2DG-2 SW Outlet (2CV-1504-2) B. IF running EDG Service Water valve did NOT open automatically, THEN open valve with Control Room handswitch. C. IF SW Outlet valve can NOT be opened from Control Room, THEN locally perform the following for the affected DG: **Examiner Note: Both EDGs will be running and the SW outlet valves will be open.**
	BOP	3. Verify SW pump suction aligned to Lake.
	BOP	4. IF SW pump suction can NOT be aligned to Lake, THEN perform the following: **Examiner Note: This step is N/A**
Attach. 51	BOP	5. IF NEITHER 2A1 OR 2A2 energized from offsite power, THEN perform the following: **Examiner Note: This step is N/A**
	BOP	6. IF BOTH 4160v Vital buses 2A3 AND 2A4 energized from offsite power, THEN start SW pumps as needed to maintain SW header pressure.
	BOP	7. IF NO 4160V busses energized, THEN return to procedure in effect. **Examiner Note: This step is N/A**
	BOP	*8. IF only ONE 4160v Vital bus energized from offsite power AND additional SW pump start desired to maintain SW header pressure, THEN perform the following: **Examiner Note: This step is N/A**
	BOP	9. IF EITHER 4160v Vital Bus supplied by EDG, THEN verify only one SW pump running on train supplied by EDG. **Examiner Note: This step is N/A**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
	BOP	*10. Maintain Service Water header pressure greater than 85 psig while performing the following using 2202.010 Exhibit 5, CCW/ACW/SW Alignment: A. IF Loop 2 CCW available, THEN restore Service Water to Component Cooling Water. B. Restore Service Water to Auxiliary Cooling Water.
	BOP	11. IF SW header pressure can NOT be maintained greater than 85 psig, THEN perform the following: **Examiner Note: This step is N/A**
	BOP	Perform OP 2202.010, Standard Attachments, Exhibit 5.
Exhibit 5	BOP	1. IF SW suction NOT aligned to lake, THEN RETURN TO procedure in effect.
	BOP	2. IF SW NOT aligned to CCW AND CCW available, THEN perform the following:
	BOP	A. IF RCP seal temperatures less than 180°F, THEN restore SW to CCW by performing the following: 1). Override and open at least ONE SW to CCW/ACW Return valve: • 2CV-1543-1 • 2CV-1542-2
Procedure Caution: **Supplying ACW flow and CCW cooling from a single SW pump may result in low SW header pressure.**		
Exhibit 5	BOP	2). Override and throttle open at least ONE SW to CCW /Main Chillers Supply valve: • 2CV-1530-1 • 2CV-1531-2 3). Maintain SW header pressure greater than 85 psig.
	BOP	3. IF CCW flow NOT aligned to RCPs AND offsite power available, THEN perform the following: **Examiner Note: CCW flow should still be aligned to RCPs.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
Exhibit 5	BOP	4. IF SW NOT aligned to ACW, THEN perform the following: A. Verify at least ONE SW to CCW/ACW Return valve open: • 2CV-1543-1 • 2CV-1542-2 B. Override and throttle open ACW Supply valves: • 2CV-1425-1 • 2CV-1427-2 C. Maintain SW header pressure greater than 85 psig.
	SRO	Perform OP 2202.003, Loss of Coolant Accident.
	ANY	■11. IF Circ Water flow lost to the Main Condenser, THEN perform the following:
	BOP	*12. 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.
	ANY	■13. Check SG levels greater than 22.2%.
	BOP	14. Align feedwater as follows: A. Verify EFW pump 2P7B capable of feeding intact SG using 2202.010 Attachment 46, Establishing EFW Flow.
	BOP	Perform OP 2202.010, Standard Attachments, Attachment 46, Establishing EFW flow. **Examiner Note: LOCA procedure continued on the next page.**
Att. 46	BOP	* 1. IF EFW pump running OR will be started AND pump suction aligned to “Q” CST, THEN monitor level to ensure Tech Spec requirements satisfied. 2. IF EFAS or MSIS is actuated THEN GO TO step 5. **Examiner Note: MSIS and EFAS are actuated go to step 5.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
Att. 46	BOP	5. IF desired to manually control EFW using 2P7B AND EFAS or MSIS actuated, THEN perform the following: A. Verify 2P7B running. B. IF desired to feed SG A, THEN perform the following: 1) Override 2P7B Discharge to SG A (2CV-1038-2) by placing handswitch to MSIS override AND then to EFAS override. 2) Override 2P7B Feed to SG A (2CV-1025-1) by placing 2HS-1025B-1 to MSIS override AND then to EFAS override. 3) Throttle 2CV-1025-1 to control SG A level. C. IF desired to feed SG B, THEN perform the following: 1) Override 2P7B Discharge to SG B (2CV-1036-2) by placing handswitch to MSIS override AND then to EFAS override. 2) Override 2P7B Feed to SG B (2CV-1075-1) by placing 2HS-1075B-1 to MSIS override AND then to EFAS override. 3) Throttle 2CV-1075-1 to control SG B level. D. IF 2P7A is running AND will not be used to feed the SGs, THEN secure 2P7A by overriding and closing Steam to EFW Pump Turbine Valve (2CV-0340-2).
	SRO	Perform OP 2202.003, Loss of Coolant Accident.
	BOP	B. IF running, THEN stop EFW pump 2P7A by overriding and closing (2CV-0340-2). C. Verify running MFW pump secured. D. Verify ALL MFW Block valves closed.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
	ANY	15. Isolate LOCA as follows: A. Verify letdown isolated. B. Verify RCS Sample Isolation valves closed: • 2SV-5833-1 • 2SV-5843-2 C. Check for intact CCW system: • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. • CCW Surge Tanks level stable. D. Verify non-actuated valve positions using 2202.010 Attachment 17, LOCA Isolation. **Examiner Note: The SRO may elect to prioritize this attachment to be performed later in the event.**
	ANY	16. Check LOCA limited to CNTMT: • CNTMT Sump level rising. • CNTMT temperature, dewpoint, and pressure greater than pre-LOCA values. • Aux Building area radiation levels stable. • Aux Building Sump level less than 53%. • Waste Tanks 2T20A and 2T20B levels stable.
	ANY	■17. Check CNTMT isolation parameters: A. CNTMT pressure trend has NOT exceeded 18.3 psia. B. "CNTMT RADIATION HI" annunciator (2K10-A6) clear.
	ANY	■18. Check CNTMT pressure trend has NOT exceeded 23.3 psia.
	ANY	*19. IF CNTMT Spray operating, THEN terminate CNTMT Spray as follows: **Examiner Note: CNTMT Spray should not be operating.**
	BOP	20. Verify ALL available miscellaneous CNTMT Building ventilation operating using 2202.010 Exhibit 13, Miscellaneous Containment Building Ventilation.
	BOP	Perform OP 2202.010, Standard Attachments, Exhibit 13.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
Exhibit 13	BOP	1.0 Verify ALL available CNTMT Building Recirculation Fans in operation: • 2VSF-31A • 2VSF-31B • 2VSF-31C • 2VSF-31D 2.0 Verify ALL available Reactor Cavity Cooling Fans in operation: • 2VSF-34A • 2VSF-34B 3.0 Verify a maximum of three CEDM Shroud Cooling Units in operation: • 2VSF-35A • 2VSF-35B • 2VSF-35C • 2VSF-35D
	SRO	Continue to perform OP 2202.003, Loss of Coolant Accident.
	ANY	■21. Check ALL AC and Vital DC buses energized.
	ANY	■22. Check IA pressure greater than 65 psig.
	ANY	23. Check for isolated LOCA: • RCS pressure controlled. • RCS leakage less than available Charging pump capacity. **Examiner Note: LOCA is not considered isolated.**
	SRO	■1. Perform controlled cooldown to 275°F TC as follows: A. Check RCS TC greater than 275°F.
	ATC	B. Reset Low PZR Pressure and Low SG Pressure setpoints during cooldown and depressurization. C. Verify maximum of ONE RCP running in EACH loop. D. <u>IF</u> RCP 2P32A or 2P32B stopped, <u>THEN</u> verify associated PZR Spray valve in MANUAL and closed.

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
CRITICAL TASK **The crew must commence a cooldown within 30 minutes of entry into the LOCA EOP.**	ATC	E. Monitor cooldown rate as follows: • Record RCS T_C and PZR temperature using 2202.010 Attachment 8, RCS Cooldown Table. • Plot RCS pressure versus RCS T_C using 2202.010 Attachment 1, P-T Limits every 15 minutes. F. Initiate RCS cooldown using SDBCS bypass valves or ADVs.
	BOP	G. Control S/G levels with EITHER of the following: • EFW using 2202.010 Attachment 46, Establishing EFW Flow • AFW using 2202.010 Attachment 52, Establishing AFW Flow H. Secure running MFW pump. I. Close ALL MFW Block valves. J. Verify maximum of one condensate pump in service. K. Maintain condensate header pressure less than 700 psig using condensate pump recircs and MFW pump recircs.
	BOP	*2. Maintain SG levels 45% to 90% [55% to 90%] throughout cooldown using the following as desired: • 2202.010 Attachment 46, Establishing EFW Flow. • 2202.010 Attachment 52, Establishing AFW Flow.
	ANY	*3. Check EFW pump CST level as follows: • IF aligned to Q CST, THEN check level greater than 17.5 feet. • IF aligned to A or B CST, THEN check level greater than 82%
	ANY	4. <u>IF</u> Condensate pump start desired for performance of cooldown, <u>THEN</u> perform the following: **Examiner Note: Condensate pump should already be running and step should be N/A.**

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
	ATC	■5. Restore PZR level as follows: A. Check PZR level greater than or recovering to 29% [50%]. B. Maintain PZR level 29% to 80% [50% to 70%]. **Examiner Note: May not be met, Perform Contingencies if required.**
	SRO	Perform Step 5 contingencies if required. A. Perform the following: 1) Perform the following as necessary to restore PZR level greater than 29% [50%]: • Operate Charging and HPSI pumps • Control RCS pressure using Attachment 48, RCS Pressure Control 2) GO TO Step 6.
	SRO	6. Check ALL available Hydrogen Analyzers in service using 2104.044, Containment Hydrogen Control Operations. **Examiner Note: Not be met, Perform Contingencies as time allows.**
	BOP	Perform Step 6 contingencies as time allows. 6. Verify all available Hydrogen Analyzers in service within 70 minutes from start of event. • Record time from Entry Section step 4: Time_______________
	SRO	*7. <u>IF</u> ALL RCPs secured, <u>THEN</u> perform the following: **Examiner Note: RCPs should be running.**
	SRO	8. <u>IF</u> ANY RCP running, <u>THEN</u> GO TO Step 12.
	ANY	*12. Check RCS void-free during cooldown as follows: A. PZR level stable while using PZR spray. B. RVLMS LVL 01 indicates WET. C. Upper head thermocouple temperature indicates subcooled conditions: • SPDS point CV2DOMEA • SPDS point CV2DOMEB

Op-Test No.: 2015-1	Scenario No.: 1	Event No.: 7, & 8
Event Description: Inadvertent Red MSIS causing a reactor trip. And Loss of Coolant accident.		

Time	Position	Applicant's Actions or Behavior
	ANY	*13. Maintain RCS P-T limits and RCP NPSH requirements, refer to 2202.010 Attachment 1, P-T Limits. **Critical Task:** Establish RCS pressure control to maintain RCS subcooling. After the HPSI failures have been addressed and MTS restored to >30 degrees F then maintain pressure and temperature within the PT limits of <200^0 F and >30^{0}F MTS throughout implementation of OP-2202.003, LOCA EOP.
Termination criteria: RCS cooldown commenced or at the discretion of the lead examiner.		

Op-Test No.: 2015-1 Scenario No.: 2 Event No.: 9 & 10

Event Description: 2P-89B Motor overload. 2CV-5035-1 High pressure safety injection and 2CV-5037-1 Low pressure safety injection valves fail to open. Green train Containment Cooling fails to actuate.

Time	Position	Applicant's Actions or Behavior
	BOP	Implement OP-2202.010, Exhibit 9 ESFAS Actuation SIAS failures.
Exhibit 9 ESFAS actuation.	BOP	*1.0 <u>IF</u> any abnormalities noted for affected ESFAS actuation, <u>THEN</u> notify CRS. 2.0 <u>IF</u> SIAS, <u>THEN</u> verify the following: ☐ Red Train RWT Outlet (2CV-5630-1) open. ☐ Red Train HPSI Pump in service with proper discharge pressure and flow. ☐ Red Train HPSI Injection MOVs open. **(BOP should open 2CV-5035-1)** ☐ Red Train Service Water Pump in service with proper discharge pressure. ☐ Red Train LPSI Pump (2P60A) in service with proper discharge pressure and flow. ☐ Red Train LPSI Injection MOVs open. **(BOP should open 2CV-5037-1)** ☐ Green Train RWT Outlet (2CV-5631-2) open. ☐ Green Train HPSI Pump in service with proper discharge pressure and flow. ☐ Green Train HPSI Injection MOVs open. ☐ Green Train Service Water Pump in service with proper discharge pressure. ☐ Green Train LPSI Pump (2P60B) in service with proper discharge pressure and flow. ☐ Green Train LPSI Injection MOVs open. ☐ Available Charging Pumps in service with proper discharge pressure and flow. ☐ Service Water Outlet Valves open for #1 and #2 EDGs. 3.0 <u>IF</u> CCAS, <u>THEN</u> verify the following: ☐ Red Train CNTMT Coolers in service. ☐ Service Water aligned to Red Train CNTMT Coolers. ☐ Red Train Bypass Dampers open. ☐ Green Train CNTMT Coolers in service. **(BOP should start 2VSF-1C)** ☐ Service Water aligned to Green Train CNTMT Coolers. **(BOP should service water to the green train CNTMT coolers)** ☐ Green Train Bypass Dampers open. **(BOP should open the bypass dampers)** Critical Task: Perform one or more of the following to maintain OR restore Margin to Saturation (MTS) > 30 degrees F. • Start a Green train HPSI pump 2P-89C • Throttle open red train HPSI valve 2CV-5035-1. If MTS lowers < 30 degrees F, it must be restored >30 degrees F within 10 min.
	BOP	Implement OP-2203.012E, 2K-05 ACA.

Op-Test No.: 2015-1	Scenario No.: 2	Event No.: 9 & 10

Event Description: 2P-89B Motor overload. 2CV-5035-1 High pressure safety injection and 2CV-5037-1 Low pressure safety injection valves fail to open. Green train Containment Cooling fails to actuate.

Time	Position	Applicant's Actions or Behavior
		Procedure Note: The following are 2P-89B Motor data and Overcurrent relays settings: • Motor Full Load Current (FLC) per phase: 75.5 amps (Expected current at full load, not a trip setpoint) • Phase B Time Delay Overcurrent relay (TOC, 151) setpoint: 90 amps (Phase B is used to alarm an Overload condition.) • Phase A & C Time Delay Overcurrent relay (TOC, 151) setpoint: 100 amps (Actuation of these relays do not cause a bkr trip until IOC-B picks up.) • Instantaneous Overcurrent relay (IOC-B, 150) trip setpoint: 160 amps (Actuation of IOC-B combined with A or C TOC relays will trip the bkr.) • Instantaneous Overcurrent relay (IOC-A, 150) trip setpoint: 1000 amps (Actuation of this relay will trip the bkr instantaneously.)
	BOP	2.1 Check current draw for each phase at 2A-406.
		Cue: If requested as a NLO to check 2A-406 current draw, then after ~ 1min. report that amps on one of the following phases. If requested all phases report all phases. Phase A: 108 amps, Phase B: 103 amps, Phase C: 109 amps and rising. After 2 min. call back and report amps are ~ 152 amps and rising. If requested for all three phases report the following. Phase A: 152 amps, Phase B: 148 amps, Phase C: 155 amps and all phases are still rising.
	BOP	2.2 IF current greater than or equal to 90 amps, THEN perform the following: 2.2.1 IF during SIAS, THEN verify ONE HPSI Pump running on Red train: • 2P-89**A** (2HS-5078-1) • 2P-89**C** (2HS-5080-1)
	BOP	2.2.2 IF 2P-89**C** available, THEN perform the following using HPSI System Operation (2104.039): A. Verify 2P-89**C** aligned to Green train (2HS-5080-2).
	BOP	2.2.3 IF NOT required for SIAS OR current approaches 160 amps, THEN secure 2P-89**B** (2HS-5079-2).
		Termination criteria: When 2CV-5035-1 is open, 2P-89C is in service and Green train CNTMT coolers aligned or at examiner's discretion.

13.0 MANUAL SHUTDOWN OF 2DG1

> **~~NOTE~~**
> If 2DG1 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.

N/A ~~13.1~~ IF SIAS is actuated,
THEN reset SIAS per Attachment 13 of Standard Attachments (2202.010).

N/A ~~13.2~~ IF 2A3 Supply breaker (2A-309) open
AND necessary to supply 2A3 from offsite power,
THEN perform the following:

13.2.1 Verify 2A1 available to supply 2A3.

> **NOTE**
> Neutral Overvolt (2K127-3) alarm clears when ENGINE/GEN TROUBLE (2K08-J1) is cleared.

13.2.2 Verify Neutral Overvolt (2K127-3) alarm clear.

13.2.3 Place 2A-309 Synchronize switch (152-309/SS) to ON.

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

- Generator voltage (Incoming) approximately 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).

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

> **CAUTION**
> 2DG1 load will lower when 2A-309 is closed because the governor control circuit shifts to DROOP.

13.2.6 Perform the following to close 2A-309:

A. WHEN synchroscope approaches the 12 o'clock position, THEN close 2A-309 (152-309 CS).

B. Immediately raise 2DG1 load to approximately 1400 KW to prevent a reverse power trip using Governor Control switch (CS 4).

13.2.7 Adjust Generator KVARs between 600 KVARs IN and 1800 KVARs OUT using Voltage Regulator switch (CS 3).
(Preferred range is 0 to 100 OUT)

13.2.8 Place 2A-309 Synchronize switch (152-309/SS) in OFF.

13.3 Perform ONE of the following to unload 2DG1:

13.3.1 IF 2DG1 fully loaded for normal run,

THEN unload as follows using governor Control switch (CS 4):

~~A.~~ In approximately 700 KW increments with approximately 5 minute wait at each increment until loaded to approximately 1400 KW.

CAUTION

EDG may trip due to anti-motoring if opening 2A-308 is delayed at 100 KW load.

CRITICAL STEP

B. WHEN 5 minutes time has elapsed at 1400 KW,

THEN perform the following:

1. Reduce load to approximately 100 KW.
2. Open 2DG1 Output breaker 2A-308 (152-308 CS).

13.3.2 IF 2DG1 post maintenance testing run in progress, THEN unload as follows using Governor Control Switch (CS 4):

A. Unload 2DG1 as directed by System Engineering.

CAUTION

EDG may trip due to anti-motoring if opening 2A-308 is delayed at 100 KW load.

CRITICAL STEP

B. WHEN 2DG1 load reduced to approximately 100 KW, THEN open 2DG1 Output breaker 2A-308 (152-308 CS).

13.4 Verify the following 2DG1 parameters:

- Frequency approximately 60 Hz, using Governor Control switch (CS 4).
- Voltage approximately 4160 volts, using Voltage Control switch (CS 3).

13.5 Perform the following administrative actions:

13.5.1 Verify Unit 1 has taken appropriate actions as identified in Attachment B of Control Room Emergency Air Conditioning and Ventilation (2104.007).

13.5.2 Verify entry into TS 3.8.1.1, 3.8.1.2, and 3.4.4 as applicable.

13.5.3 Declare Diesel Engine inoperable due to START handswitch in STOP (energizes Shutdown 5 relay for 60 seconds which blocks Engine auto start).

NOTE

Expect annunciator 2DG1 NOT AVAIL (2K08-F1) when stopping 2DG1.

13.6 Secure 2DG1 by placing Engine Start switch (2HS-2809-1) in STOP.

13.7 WHEN 2DG1 NOT AVAIL (2K08-F1) alarm clear, THEN EDG may be declared OPERABLE.

13.8 Check the following pumps auto start:

- Standby Lube Oil Circulating pump (2P-171A)
- {4.3.2} Standby Coolant System Circulating pump (2P-167A)

CAUTION

If DC control power to Engine Governor NOT available, the engine will start when air rolled unless overspeed trip mechanism is tripped with Emergency Stop pushbutton.

NOTE

The air roll of the EDG may be N/A'ed or delayed with the concurrence of System Engineering and the OPS Manager.

13.9 Perform the following to air roll 2DG1:

13.9.1 Verify engine shutdown greater than 15 minutes.

13.9.2 Perform the following for EDG inoperability:

A. Verify Unit 1 has taken appropriate actions as identified in Attachment B of Control Room Emergency Air Conditioning and Ventilation (2104.007).

B. Verify entry into TS 3.8.1.1, 3.8.1.2, and 3.4.4 as applicable.

C. Declare Diesel Engine inoperable due to Local Engine Control switch in LOCKOUT.

NOTE

Expect annunciator 2DG1 NOT AVAIL (2K08-F1), ENGINE/EXCITER SHUTDOWN (2K08-C2), and ESF ELECT SYS INOP (2K07-J2) when placing 2HS-2815-1 to LOCKOUT.

13.9.3 Unlock and place local Engine Control switch (2HS-2815-1) to LOCKOUT.

13.9.4 Close Bearing Oil Booster Isol (2ED-1049A).

NOTE

Expect annunciator START AIR TROUBLE (2K08-H1) when air rolling EDG.

13.9.5 Perform the following to manually operate EITHER Air Start Solenoid (2SV-2809-1 or 2SV-2810-1):

A. Slowly rotate Manual Operator stem clockwise until engine starts to rotate.

B. WHEN engine has rotated at least two revolutions, THEN rotate Manual Operator counter-clockwise.

13.9.6 Open Bearing Oil Booster Isol (2ED-1049A).

13.9.7 Place Engine Control switch (2HS-2815-1) to AUTO.

13.9.8 Remove key from Engine Control switch (2HS-2815-1).

13.10 WHEN ALL of the following are complete:

- Engine Control switch in AUTO.
- Engine Control switch key removed.
- 2DG1 NOT AVAIL (2K08-F1) alarm clear.
- All alarms concerning 2DG1 cleared OR any concern raised by alarms is resolved.
- IF Engine Air roll will be performed,
  THEN verify Engine Air roll completed.

THEN 2DG1 may be declared OPERABLE.

13.11 IF 2VSF-8A/B Outside Air Intake damper (2HVD-72) was closed,
THEN restore 2VSF-8A/B Outside Air Intake damper (2HVD-72).

13.12 WHEN 2DG1 has been shutdown for 30 minutes,
THEN close 2DG1 SW Outlet valve 2CV-1503-1 (2HS-1503-1).

13.13 Complete EDG Start/Load/Run Information sheet (Form 2104.036A).

13.14 Inform Unit 1 to verify placard removed from MTG Voltage regulator.

Unit 2 Shift Relief Sheet

Computer Generated Form (1015.016)

Date: Today	Shift: Days	Crew: Yours
Plant Power: ~100%	Plant Mode: 1	Days On Line: 250
Protected Train: (per COPD-013 Att. L) **GREEN**	Current Risk: Minimal	Scheduled Risk: Minimal

Reactivity Control Parameters

RCS Dilution Shift Total	60	Gallons	Dilution Batch Volume	20	Gallons	EFPD	250	RCS Boron 873 PPM
RCS Boration Shift Total	0	Gallons	Boration Batch Volume	5	Gallons			PZR Boron 874 PPM
Next Expected Boration/ Dilution	N/A	Approximate Boration for Power Reduction		90% 1 hour 234 gal (4 gpm)	80% 2 hours 395 gal (4 gpm)	70% 1.25 hours 651 gal (11 gpm)	60% 2 hours 751 gal (9 gpm)	20% 2 hours 1387 gal (16 gpm)
1 hour Shutdown			BAMT Gravity Feed with dilution			1 Charging pump 4 gpm	2 Charging pumps 42 gpm	3 Charging Pumps 79 gpm
2 hour Shutdown			RWT Gravity Feed with dilution			1 Charging pump N/A	2 Charging pumps 14 gpm	3 Charging pumps 43 gpm

SPECIFICATIONS IN EFFECT: {include date / time when LCO entered and limiting action}	Entered:	Time clock:	Due date
• None			
•			

INDEFINITE/CONDITIONAL:	Post RX Trip Contingencies
• None	•

CONTROL ROOM ALARM STATUS:

- 2K07 J2 ESF Electrical System Inop due to #1 EDG running.

EVOLUTIONS IN PROGRESS (List continuous action steps, parameters being monitored, frequency, and individual responsible as applicable)

- Running #1 EDG @ 1400kw, Unload and secure #1 EDG starting with OP-2104.036 Step 13.3.1.

EVOLUTIONS COMPLETED	EVOLUTIONS SCHEDULED
• Pumped RDT • HWMU to 12 GPM • •	• •

COMPONENTS AFFECTING EOOS	PROTECTED EQUIPMENT
• None •	• **GREEN** Train IAW COPD-013 Att. L •

EQUIPMENT CONFIGURATION CONTROL CHANGES: (past 12 hours)

Configuration Control	Tagging	Category E	Containment Pen.	Caution Tags
None	None	None	None	None

Unit 2 Shift Relief Sheet

Computer Generated Form (1015.016)

CARRYOVER ITEMS:
•

WMC COMMUNICATIONS:
•

DELAYED SURVEILLANCES / EVOLUTIONS / WORK PLANS:

Procedure and Work Order Number	Status of procedure	Location	Reason	Due Date	Late date	Owner
•						
•						
•						

NEW INSTRUCTIONS/PROCEDURE CHANGES	(A)(1) System(s) http://www.ano.entergy.com/a1rule/index.HTM
•	AAC, SDC, HPSI, Transformers, FWCS

CHEMISTRY / RADIOLOGICAL PROTECTION:
•

OTHER UNIT IMPACT
•

UNIT TWO Operator Work-Arounds/ OPS Burdens:
Operator Burdens (online): • **Operator Burdens (outage):** •

Use the following list as a place keeping tool for review of items for shift turnover. Check off the items applicable to your watch station.
Review appropriate index on first day back and then use the past 12 hour section.

Standing orders (ALL)		Board Walk down (SM,CRS,STA,RO)	
TS/TRM/ODCM/ Review (ALL)		Review Annunciator OOS Log (SM,CRS,STA,RO)	
Clearance/ Caution Tagout Review (ALL)		Review OPS-B38 (Nightshift only) (RO, CRS)	
Category E Valve Log (ALL)		Maintenance Schedule (SM,CRS)	
Configuration Control (ALL)		Current SWYD/Transformer Yard Impact (SM, CRS)	
Status Board (ALL)		EN-OP-104 section 5.6 review (SM)	
Temporary Modification Log (ALL)		Key Log and Key Cabinet Key (SM)	
Station Log Review (ALL)		Verify Work Request for the prior shift reviewed (SM)	
Review Procedures in progress (ALL)		Pager/VOIP phone turnover(SM,STA)	
Verification of Plateau quals (at beginning of each work week) (ALL)		Watch stander review of OOS logs (RO, NLO)	
Review ODMI's (at beginning of each work week) (ALL)		Key Ring (RO, NLO)	

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APPLICANT	EVENT TYPE	Scenarios															
		1			2			3 (spare)			4			TOTAL	MINIMUM(*)		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO **X** SRO-I ☐ SRO-U ☐	RX		4						2					1	1	1	0
	NOR						1							1	1	1	1
	I/C		2,5				3,5,9, 10		3,5					6	4	4	2
	MAJ		6,7				7,8		6,7					4	2	2	1
	TS													0	0	2	2
RO **X** SRO-I ☐ SRO-U ☐	RX													0**	1	1	0
	NOR			1						1				1	1	1	1
	I/C			2,3,4, 8		2,4, 6				4,5,8, 9				7	4	4	2
	MAJ			6,7		7,8				6,7				4	2	2	1
	TS													0	0	2	2
RO ☐ SRO-I ☐ SRO-U **X**	RX													0	1	1	0
	NOR	1			1			1,2						2	1	1	1
	I/C	2,3,4, 5,8			2,3,4, 5,6,9, 10			3,4,5, 8,9						12	4	4	2
	MAJ	6,7			7,8			6,7						4	2	2	1
	TS	4,5			1,6			3,5						4	0	2	2
RO ☐ SRO-I ☐ SRO-U **X**	RX													0	1	1	0
	NOR	1					1*			1				1	1	1	1
	I/C	2,3,4, 5,8					3,5,9, 10*			4,5,8, 9				5	4	4	2
	MAJ	6,7					7,8*			6,7				2	2	2	1
	TS	4,5												2	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls" (ATC) and "balance-of-plant" (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a one-for-one basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

4. For licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

* BOP events not credited for SROU in total column.
** Reactivity substituted IAW note 2 of the instructions.

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APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3 (spare)			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I **X** SRO-U ☐	RX		4						2					1	1	1	0
	NOR				1			1,2						1	1	1	1
	I/C		2,5		2,3,4, 5,6,9, 10			3,4,5, 8,9	3,5					9	4	4	2
	MAJ		6,7		7,8			6,7	6,7					4	2	2	1
	TS				1,6			3,5						2	0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls" (ATC) and "balance-of-plant" (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a one-for-one basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

4. For licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

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Competencies	APPLICANTS															
	RO X SRO-I ☐ SRO-U ☐				RO X SRO-I ☐ SRO-U ☐				RO ☐ SRO-I ☐ SRO-U X				RO ☐ SRO-I ☐ SRO-U X			
	SCENARIO				SCENARIO				SCENARIO				SCENARIO			
	1 ATC	2 BOP	3 ATC	4	1 BOP	2 ATC	3 BOP	4	1 SRO	2 SRO	3 SRO	4	1 SRO	2 BOP	3 BOP	4
Interpret/Diagnose Events and Conditions	2,4,5,6,7	3,5,7,8,9	3,5,6,7,9		3,4,6,7,8	2,4,6,7,8	4,5,6,7,8,9		2,3,4,5,6,7,8	2,3,4,6,7,8,9,10	3,4,5,6,7,8,9		2,3,4,5,6,7,8	3,5,7,8,9	4,5,6,7,8,9	
Comply With and Use Procedures (1)	4,5,6,7	1,3,5,7,8,9	2,3,7,9		1,2,3,6,7,8	6,8	1,4,6,7,9		2,4,5,6,7,8	1,4,6,7,8,9	2,3,4,5,6,7,8,9		2,4,5,6,7,8	1,3,5,7,8,9	1,4,6,7,9	
Operate Control Boards (2)	2,4,5,6,7	1,3,5,7,8,9	2,3,5,6,7,9		1,2,3,4,6,7,8	2,4,6,7,8	1,4,5,6,7,8,9		N/A	N/A	N/A		N/A	1,3,5,7,8,9	1,4,5,6,7,8,9	
Communicate and Interact	2,4,5,6,7	1,3,5,7,8,9	2,3,5,6,7,9		1,2,3,4,6,7,8	2,4,6,7,8	1,4,5,6,7,8,9		1,2,3,4,5,6,7,8	1,2,3,4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9		1,2,3,4,5,6,7,8	1,3,5,7,8,9	1,4,5,6,7,8,9	
Demonstrate Supervisory Ability (3)	N/A	N/A	N/A		N/A	N/A	N/A		1,2,3,4,5,6,7,8	1,2,3,4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9		1,2,3,4,5,6,7,8	N/A	N/A	
Comply With and Use Tech. Specs. (3)	N/A	N/A	N/A		N/A	N/A	N/A		4,5	1,6	3,5		4,5	N/A	N/A	

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Competency Rating factors as described on forms ES-303-1 and ES-303-3.)

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Competencies	APPLICANTS															
	RO ☐ SRO-I X SRO-U ☐				RO ☐ SRO-I ☐ SRO-U ☐				RO ☐ SRO-I ☐ SRO-U ☐				RO ☐ SRO-I ☐ SRO-U ☐			
	SCENARIO				SCENARIO				SCENARIO				SCENARIO			
	1 ATC	2 SRO	3 ATC	4	1	2	3	4	1	2	3	4	1	2	3	4
Interpret/Diagnose Events and Conditions	2,4,5,6,7	2,3,4,6,7,8,9,10	3,5,6,7,9													
Comply With and Use Procedures (1)	4,5,6,7	1,4,6,7,8,9	2,3,7,9													
Operate Control Boards (2)	2,4,5,6,7	N/A	2,3,5,6,7,9													
Communicate and Interact	2,4,5,6,7	1,2,3,4,5,6,7,8,9,10	2,3,5,6,7,9													
Demonstrate Supervisory Ability (3)	N/A	1,2,3,4,5,6,7,8,9,10	N/A													
Comply With and Use Tech. Specs. (3)	N/A	1,6	N/A													

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Competency Rating factors as described on forms ES-303-1 and ES-303-3.)