Facility: COMANCHE PEAK Task No.: RO1307

Task Title: Perform an RWST Blended Makeup Calculation JPM No.: 2007 NRC RO Admin A.1.a

K/A Reference: Generic 2.1.25 2.8

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 1.
- VCT level is stable at 60%.
- Current RWST Boron concentration is 2500 ppm.
- BAT X-01 is at 96% and BAT X-02 is at 93%. Both BATs have a concentration of 7440 ppm.
- An OPERABLE boration flowpath exists.

Task Standard: Calculate a blended RWST makeup in accordance with SOP-104A.

Required Materials: SOP-104A, Reactor Make-Up And Chemical Control System
TDM-201A, CVCS Calculations/ Blended Flow
TDM-804A, Equipment Data Tank Height vs. Volume
Calculator

Initiating Cue: The Unit Supervisor directs you to perform a blended makeup to the Unit 1 RWST at a total blended flow of 40 gpm to raise RWST level from 97% to 100% in accordance with SOP-104A, Section 5.2.6.

- **Determine** the gallons of makeup required to raise RWST level from 97% to 100%.
- **Determine** the required Boric Acid Flow Rate and Reactor Makeup Water Flow Rate for a makeup concentration of 2500 ppm at a total blended flowrate of 40 gpm.
- **Record** the following information:
  - RWST Makeup Required
    _____ gallons
  - Boric Acid Flowrate
    _____ gpm
  - Reactor Makeup Water Flowrate
    _____ gpm
  - Total Gallons of Boric Acid Required
    _____ gallons

Time Critical Task: N/A

Validation Time: 20 minutes

JPM SETUP

EXAMINER:

PROVIDE examinee with a copy of:

- **SOP-104A, Reactor Make-Up And Chemical Control System**
- **TDM-201A, CVCS Calculations/ Blended Flow**
- **TDM-804A, Equipment Data Tank Height vs. Volume**
- **Calculator**

(Denote Critical Steps with a check mark)

START TIME: _____

√ **Performance Step: 1** Determine the gallons of makeup required to raise RWST level from 97% to 100%.

Standard: (523,479.1 - 508,220.9 = **15,258.2 gallons**) per TDM-804A. Acceptable values are from **14,758 to 15,758 gallons**.

Evaluator's Note: Tank volumes found on page 16 of 56 in TDM-804A.

Comment:

√ **Performance Step: 2** Determine required boric acid flowrate.

Standard: $F_b = C \bullet F_T / C_{bat}$ (2500 ● 40 / 7440 = **13.44 gpm**) per TDM-201A. Acceptable values are from **13.4 to 13.5 gpm**.

Evaluator's Note: Formula found on page 8 of 14 in TDM-201A.

Comment:

Performance Step: 3 Determine required reactor makeup water flowrate.

Standard: $F_M = F_T - F_b$ (40 - 13.44 = **26.56 gpm**) per TDM-201A.

Acceptable values are from **26.5 to 26.6 gpm**.

Evaluator's Note: Formula found on page 8 of 14 in TDM-201A.

Comment:

Performance Step: 4 Determine total gallons of boric acid required.

Standard: 15,258.2 gallons ● 13.44/40 = **5,126.76 gallons**. Acceptable values are from 14,758 gallons ● 13.4/40 = **4943.9 gallons** to 15,758 gallons ● 13.5/40 = **5318.3 gallons**

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC RO JPM A.1.a

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: Given the following conditions:

- Unit 1 is in MODE 1.
- VCT level is stable at 60%.
- Current RWST Boron concentration is 2500 ppm.
- BAT X-01 is at 96% and BAT X-02 is at 93%. Both BATs have a concentration of 7440 ppm.
- An OPERABLE boration flowpath exists.

INITIATING CUE: The Unit Supervisor directs you to perform a blended makeup to the Unit 1 RWST at a total blended flow of 40 gpm to raise RWST level from 97% to 100% in accordance with SOP-104A, Section 5.2.6.

- **Determine** the gallons of makeup required to raise RWST level from 97% to 100%.
- **Determine** the required Boric Acid Flow Rate and Reactor Makeup Water Flow Rate for a makeup concentration of 2500 ppm at a total blended flowrate of 40 gpm.
- **Record** the following information:
  - RWST Makeup Required
    _____ gallons
  - Boric Acid Flowrate
    _____ gpm
  - Reactor Makeup Water Flowrate
    _____ gpm
  - Total Gallons of Boric Acid Required
    _____ gallons

Facility: COMANCHE PEAK Task No.: SO1002

Task Title: Review an RWST Blended Makeup Calculation JPM No.: 2007 NRC SRO Admin A.1.a

K/A Reference: Generic 2.1.25 3.1

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 1.
- VCT level is stable at 60%.
- Current RWST Boron concentration is 2500 ppm.
- BAT X-01 is at 96% and BAT X-02 is at 93%. Both BATs have a concentration of 7440 ppm.
- An OPERABLE boration flowpath exists.

You have directed the RO to perform a blended makeup to the Unit 1 RWST at a total blended flow of 40 gpm to raise RWST level from 97% to 100% in accordance with SOP-104A, Section 5.2.6.

- **Determine** the gallons of makeup required to raise RWST level from 97% to 100%.
- **Determine** the required Boric Acid Flow Rate and Reactor Makeup Water Flow Rate for a makeup concentration of 2500 ppm at a total blended flowrate of 40 gpm.
- **Record** the following information:
  - RWST Makeup Required
  - Boric Acid Flowrate
  - Reactor Makeup Water Flowrate
  - Total Gallons of Boric Acid Required

Task Standard: Review a blended RWST makeup calculation performed in accordance with SOP-104A.

Required Materials: SOP-104A, Reactor Make-Up And Chemical Control System
TDM-201A, CVCS Calculations/ Blended Flow
TDM-804A, Equipment Data Tank Height vs. Volume Calculator

Initiating Cue: Review the following calculations. Determine if calculated value is SAT or UNSAT and enter a corrected value if applicable:

- o RWST Makeup Required
  20,344.3 gallons **SAT** or **UNSAT** (circle one)
  _____ corrected value (if applicable)

- o Boric Acid Flowrate
  13.44 gpm **SAT** or **UNSAT** (circle one)
  _____ corrected value (if applicable)

- o Reactor Makeup Water Flowrate
  27.56 gpm **SAT** or **UNSAT** (circle one)
  _____ corrected value (if applicable)

- o Total Gallons of Boric Acid Required
  6835.68 gallons **SAT** or **UNSAT** (circle one)
  _____ corrected value (if applicable)

Time Critical Task: N/A

Validation Time: 20 minutes

JPM SETUP

EXAMINER:

PROVIDE examinee with a copy of:

- **SOP-104A, Reactor Make-Up And Chemical Control System**
- **TDM-201A, CVCS Calculations/ Blended Flow**
- **TDM-804A, Equipment Data Tank Height vs. Volume**
- **Calculator**

(Denote Critical Steps with a check mark)

START TIME: _____

√	**Performance Step: 1**	Review the gallons of makeup required to raise RWST level from 97% to 100% value.
	Standard:	Documents value is **UNSAT** and enters the following corrected value, (523,479.1 - 508,220.9 = **15,258.2 gallons**) per TDM-804A. Acceptable values are from **14,758 to 15,758 gallons**.
	Evaluator's Note:	Tank volumes found on page 16 of 56 in TDM-804A.
	Comment:	**A value of 20344.3 gallons is entered in the review data. This value is based on raising RWST level from 96 to 100%. (523,479.1 - 503,134.8 = 20344.3 gallons)**

√	**Performance Step: 2**	Review required boric acid flowrate value.
	Standard:	Documents value is **SAT**, corrected value is not applicable. $F_b = C \bullet F_T / C_{bat}$ (2500 ● 40 / 7440 = **13.44 gpm**) per TDM-201A. Acceptable values are from **13.4 to 13.5 gpm**.
	Evaluator's Note:	Formula found on page 8 of 14 in TDM-201A.
	Comment:	**This value is correct in the review data.**

	Performance Step: 3	Review required reactor makeup water flowrate value.
	Standard:	Documents value is **UNSAT** and enters the following corrected value $F_M = F_T - F_b$ (40 - 13.44 = **26.56 gpm**) per TDM-201A. Acceptable values are from **26.5 to 26.6 gpm**.
	Evaluator's Note:	Formula found on page 8 of 14 in TDM-201A.
	Comment:	**A value of 27.56 is entered in the review data. This value is based on a math error while subtracting 13.44 from 40 gpm.**

Performance Step: 4 Review total gallons of boric acid required value.

Standard: Documents value is **UNSAT** and enters the following corrected value, 15,258.2 gallons ● 13.44/40 = **5,126.76 gallons**. Acceptable values are from 14,758 gallons ● 13.4/40 = **4,943.9 gallons** to 15,758 gallons ● 13.5/40 = **5,318.3 gallons**

Comment: **A value of 6,835.68 gallons is entered in the review data. This value is based on a total blended makeup of 20,344.3 gallons.**

Terminating Cue: **This JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC SRO JPM A.1.a

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: Given the following conditions:

- Unit 1 is in MODE 1.
- VCT level is stable at 60%.
- Current RWST Boron concentration is 2500 ppm.
- BAT X-01 is at 96% and BAT X-02 is at 93%. Both BATs have a concentration of 7440 ppm.
- An OPERABLE boration flowpath exists.

You have directed the RO to perform a blended makeup to the Unit 1 RWST at a total blended flow of 40 gpm to raise RWST level from 97% to 100% in accordance with SOP-104A, Section 5.2.6.

- **Determine** the gallons of makeup required to raise RWST level from 97% to 100%.
- **Determine** the required Boric Acid Flow Rate and Reactor Makeup Water Flow Rate for a makeup concentration of 2500 ppm at a total blended flowrate of 40 gpm.
- **Record** the following information:
    - RWST Makeup Required
    - Boric Acid Flowrate
    - Reactor Makeup Water Flowrate
    - Total Gallons of Boric Acid Required

INITIATING CUE: Review the following calculations. Determine if calculated value is SAT or UNSAT and enter a corrected value if applicable:

- RWST Makeup Required
  20,344.3 gallons **SAT** or **UNSAT** (circle one)
  _____ corrected value (if applicable)

- Boric Acid Flowrate
  13.44 gpm **SAT** or **UNSAT** (circle one)
  _____ corrected value (if applicable)

- Reactor Makeup Water Flowrate
  27.56 gpm **SAT** or **UNSAT** (circle one)
  _____ corrected value (if applicable)

- Total Gallons of Boric Acid Required
  6835.68 gallons **SAT** or **UNSAT** (circle one)
  _____ corrected value (if applicable)

Facility: COMANCHE PEAK Task No.:

Task Title: Perform Calorimetric Heat Balance JPM No.: 2007 NRC RO/SRO Admin A.1.b

K/A Reference: Generic 2.1.23 3.9 / 4.0

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: Given the following conditions:

- A Unit 1 Calorimetric is required.
- The Plant Computer and the Leading Edge Flow Meter are unavailable for use.
- All Prerequisites have been completed.
- Steam Generator Blowdown is isolated.

Task Standard: Correctly perform Critical Steps of OPT-309.

Required Materials: OPT-309, Unit Calorimetric, Rev 11, PCN-5.

OPT-309-2, Calorimetric Data Reduction Worksheet, Rev 7, PCN-1.

OPT-309-11, Unit 1 Calorimetric Data Sheet, Rev 6.

Initiating Cue: The Shift Manager directs you to:

- **OBTAIN** data from the completed OPT-309-11, Unit 1 Calorimetric Data Sheet.
- **ENTER** required data onto OPT-309-2, Calorimetric Data Reduction Worksheet.
- **PERFORM** OPT-309, Calorimetric Heat Balance, Step 8.2, Manual Calorimetric Calculation using OPT-309-2, Calorimetric Data Reduction Worksheet.

Time Critical Task: N/A

Validation Time: 20 minutes

JPM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **OPT-309, Unit Calorimetric.**
- **OPT-309-2, Calorimetric Data Reduction Worksheet.**
- **A completed OPT-309-11, Unit 1 Calorimetric Data Sheet.**
- **Steam Tables.**
- **Calculator.**

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Enter the Unit and Date to Initiate calorimetric data reduction steps.

Standard: RECORD the Unit and Date on OPT-309-2, Calorimetric Data Reduction Worksheet.

Comment:

Performance Step: 2 Calculate the Feedwater Average Temperature as follows:

- Average all Feedwater temperature data sets, given in Step 8.2.1D of the "Calorimetric Data Sheet" for each Steam Generator AND enter results in column 2.
- Average the values calculated in Step 8.2.2.2A above AND enter the result in column 3.

Standard: CALCULATE Feedwater Temperature Average Value of Data Sets (ºF) and Overall Average (ºF) and ENTER data on OPT-309-2, Calorimetric Data Reduction Worksheet, Step 8.2.2.2.

Comment:

Performance Step: 3 Calculate the Feedwater Average Pressure as follows:

- Average all Feedwater pressure data sets, given in Step 8.2.1E of the "Calorimetric Data Sheet" for each Steam Generator AND enter results in column 2.
- Add 14.7 to each entry in column 2 AND enter results in column 3.
- Average the values calculated in Step 8.2.2.3B above AND enter result in column 4.

Standard: CALCULATE Feedwater Pressure Average Value of Pressure Data Sets (PSIG) then CONVERT values by ADDING 14.7 then CALCULATE Overall Average (PSIA) and ENTER data on OPT-309-2, Calorimetric Data Reduction Worksheet, Step 8.2.2.3.

Comment:

Performance Step: 4 Calculate the Feedwater Flow Averages in LB/HR for each Steam Generator, using the feedwater data given in Step 8.2.1B OR 8.2.1C of the "Calorimetric Data Sheet", as follows:

- IF Computer or Main Control Board indications were used to obtain Feedwater Flow data, THEN average all data sets for each Steam Generator AND enter results in column 2.
- Enter the Correction Factor from Attachment 10.1 in column 3 using the feedwater temperature for each associated SG from Step 8.2.2.2, column 2.
- Calculate the corrected flow value by multiplying flow from column 2 by correction factor in column 3 and enter result in column 4.

Standard: CALCULATE Feedwater Flow Average Value of Flow Data Sets (LB/HR) then APPLY Correction Factor values using feedwater temperature then CALCULATE Corrected Flow Value (LB/HR) and ENTER data on OPT-309-2, Calorimetric Data Reduction Worksheet, Step 8.2.2.4.

Comment:

Performance Step: 5 Calculate the Corrected Steam Generator Steam Pressure Averages as follows:

- Average all Main Steam line steam pressure data sets, given in Step 8.2.1F of the "Calorimetric Data Sheet" for each Steam Generator AND enter results in column 2.
- Add 14.7 to each entry in column 2 AND enter results in column 3.
- Add each entry made in column 3 to column 4 AND enter results in column 5.
- Average the values calculated in Step 8.2.2.5C above AND enter result in column 6.

Standard: CALCULATE Corrected Steam Generator Steam Pressure using Average Value of Pressure Data Sets (PSIG) then CONVERT values by ADDING 14.7 then ADD the Pressure Drop Due to Line Loss, CALCULATE Corrected Pressure (PSIA) then CALCULATE Overall Average (PSIA) and ENTER data on OPT-309-2, Calorimetric Data Reduction Worksheet, Step 8.2.2.5.

Comment:

Performance Step: 6 Calculate the Steam Generator Blowdown Average Values as follows:

- IF Steam Generator Blowdown was isolated during this test, THEN enter zero in column 2 of this step, in column 3 of Step 8.2.2.7, in column 3 of Step 8.2.2.8 and in column 2 of 8.2.2.11, AND proceed to Step 8.2.2.9.

Standard: ENTER zero (0) in column 2 of Step 8.22.6, in column 3 of Step 8.2.2.7, in column 3 of Step 8.2.2.8 and in column 2 of 8.2.2.11, and PROCEED to Step 8.2.2.9.

Comment:

Performance Step: 7 Perform Steam Generator Enthalpy Rise Calculation as follows:

- Enter corrected steam pressures given in column 5 of Step 8.2.2.5, in column 2.
- Using Steam Tables obtain the steam enthalpies AND enter results in column 3.

Standard: CALCULATE Steam Generator Enthalpy Rise using corrected steam pressures (PSIA) then CALCULATE associated steam enthalpy values using Steam Tables and ENTER data on OPT-309-2, Calorimetric Data Reduction Worksheet, Step 8.2.2.9.

Comment:

Performance Step: 8 Enter feedwater enthalpy from one of the following sources:

- Using Steam Tables obtain the enthalpy of the feedwater liquid AND enter result in column 4.
- Subtract the value in column 4 from values in column 3 AND enter the results in column 5.

Standard: CALCULATE Feedwater Enthalpy using Steam Tables then SUBTRACT value in column 4 from values in column 3 and ENTER data on OPT-309-2, Calorimetric Data Reduction Worksheet, Step 8.2.2.9.

Comment:

Performance Step: 9 Perform Steam Generator Heat Gain Calculation as follows:

- Enter the enthalpy rise for each Steam Generator given in column 5 of Step 8.2.2.9, into column 2.
- Calculate steam flow for each Steam Generator by using the formula given in the heading of column 3. Use data for Feedwater flow given in column 4 of Step 8.2.2.4 AND blowdown flow given in column 3 of Step 8.2.2.7. Enter results in column 3
- Multiply the entries in column 2 by entries in column 3, AND enter results in column 4.
- Total the entries of column 4 and enter result at the base of this column.

Standard: CALCULATE Steam Generator Heat Gain; RECORD enthalpy rise for each Steam Generator then RECORD steam flow for each Steam Generator then MULTIPLY the entries in column 2 by entries in column 3, and ENTER results in column 4 then TOTAL the entries and ENTER data on OPT-309-2, Calorimetric Data Reduction Worksheet, Step 8.2.2.10.

Comment:

√ **Performance Step: 10** Perform Percent Rated Thermal Power Calculation as follows:

- Enter the Steam Generator Heat Gain given in space at the base of column 4 from Step 8.2.2.10, in column 1.
- Calculate Net Reactor Power by using the formula given in the heading of column 4 AND the data given in columns 1, 2 and 3. Enter results in column 4.
- Substitute values from column 4 and column 5 into the formula in the heading of column 6 AND calculate Percent Rated Thermal Power. Enter the result in column 6.

Standard: CALCULATE Percent Rated Thermal Power using Steam Generator Heat Gain then CALCULATE Net Reactor Power value then SUBSTITUTE values and CALCULATE Percent Rated Thermal Power and ENTER data on OPT-309-2, Calorimetric Data Reduction Worksheet, Step 8.2.2.11. **CALCULATE a Percent Rated Thermal Power of 93.85% ±0.5%.**

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM A.1.b

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: Given the following conditions:

- A Unit 1 Calorimetric is required.
- The Plant Computer and the Leading Edge Flow Meter are unavailable for use.
- All Prerequisites have been completed.
- Steam Generator Blowdown is isolated.

INITIATING CUE: The Shift Manager directs you to:

- **OBTAIN** data from the completed OPT-309-11, Unit 1 Calorimetric Data Sheet.
- **ENTER** required data onto OPT-309-2, Calorimetric Data Reduction Worksheet.
- **PERFORM** OPT-309, Calorimetric Heat Balance, Step 8.2, Manual Calorimetric Calculation using OPT-309-2, Calorimetric Data Reduction Worksheet.

SG 1 FW FLO - 1-FI-510A	3.6	3.6	3.6
SG 1 FW FLO - 1-FI-511A	3.5	3.7	3.6
SG 2 FW FLO - 1-FI-520A	3.5	3.7	3.5
SG 2 FW FLO - 1-FI-521A	3.6	3.6	3.7
SG 3 FW FLO - 1-FI-530A	3.6	3.7	3.7
SG 3 FW FLO - 1-FI-531A	3.5	3.5	3.6
SG 4 FW FLO - 1-FI-540A	3.6	3.7	3.6
SG 4 FW FLO - 1-FI-541A	3.5	3.6	3.6
SG 1 FW NZL TEMP - 1-TI-2177B	435	445	440
SG 2 FW NZL TEMP - 1-TI-2178B	435	440	445
SG 3 FW NZL TEMP - 1-TI-2179B	440	435	445
SG 4 FW NZL TEMP - 1-TI-2180B	435	445	440
SG 1 FW PRESS - 1-PI-2138	1040	1050	1045
SG 2 FW PRESS - 1-PI-2139	1050	1045	1055
SG 3 FW PRESS - 1-PI-2140	1050	1040	1045
SG 4 FW PRESS - 1-PI-2141	1060	1050	1055
MSL 1 PRESS CHAN II - 1-PI-515A	1005	1000	1010
MSL 1 PRESS CHAN IV - 1-PI-516A	1000	1005	1005
MSL 1 PRESS CHAN I - 1-PI-514A	1010	1010	1000
MSL 2 PRESS CHAN I - 1-PI-524A	1005	1000	1010
MSL 2 PRESS CHAN III - 1-PI-526A	1005	1010	1005
MSL 2 PRESS CHAN II - 1-PI-525A	1005	1000	1005
MSL 3 PRESS CHAN II - 1-PI-535A	1010	1010	1000
MSL 3 PRESS CHAN I - 1-PI-534A	1005	1000	1010
MSL 3 PRESS CHAN III - 1-PI-536A	1000	1005	1005
MSL 4 PRESS CHAN I - 1-PI-544A	1005	1010	1000
MSL 4 PRESS CHAN II - 1-PI-545A	1005	1005	1005
MSL 4 PRESS CHAN IV - 1-PI-546A	1010	1000	1005
PR CHAN I - N-41A	94.4	94.5	94.3
PR CHAN II - N-42A	94.5	94.5	94.5
PR CHAN III - N-43A	94.3	94.3	94.2
PR CHAN IV - N-44A	94.1	94.2	94.1
RC LOOP 1 N16 PWR CHAN I - 1-JI-411A	93.5	93.9	93.8
RC LOOP 2 N16 PWR CHAN II - 1-JI-421A	93.5	93.9	94.1
RC LOOP 3 N16 PWR CHAN III - 1-JI-431A	94.1	93.7	93.8
RC LOOP 4 N16 PWR CHAN IV - 1-JI-441A	93.6	93.7	93.8

UNIT 1 CALORIMETRIC DATA SHEET

Unit 1 Date TODAY

DATA SOURCE (Circle One): High Accuracy Computer | Normal Accuracy Computer | Normal Accuracy MCB

STEP 8.2.1	PARAMETER	HIGH ACCURACY (COMPUTER POINT)	NORMAL ACCURACY (COMPUTER POINT)	NORMAL ACCURACY (MCB INDICATOR)	DATA SETS 1 TIME:	2 TIME:	3 TIME:
NOTE: When performing calorimetric using Main Control Board indication and the LEFM is not available, both Feedwater Flow indicators on all loops are required operable to satisfy assumed accuracy requirements.							
B	IF LEFM is being used for FW flow, THEN perform the folllowing: • Verify LEFM Main display - "✔" icon displayed in green (TRS 13.3.34.1) • IF LEFM "wrench" displayed in yellow, THEN notify System Engineering.				Initials / Date / Time N/A , TODAY , NOW		
	Total FW Flow	LEFM Display or F5447A	LEFM Display or F5447A	LEFM Display or F5447A	UNITS = 10^6 LB/HR N/A	N/A	N/A
C					UNITS = MLB/HR		
	SG 1 FW FLO	F5992A	F6414A	1-FI-510A	3.6	3.6	3.6
	SG 1 FW FLO	F5993A	F6404A	1-FI-511A	3.5	3.7	3.6
	SG 2 FW FLO	F5994A	F6434A	1-FI-520A	3.5	3.7	3.5
	SG 2 FW FLO	F5995A	F6424A	1-FI-521A	3.6	3.6	3.7
	SG 3 FW FLO	F5996A	F6454A	1-FI-530A	3.6	3.7	3.7
	SG 3 FW FLO	F5997A	F6444A	1-FI-531A	3.5	3.5	3.6
	SG 4 FW FLO	F5998A	F6474A	1-FI-540A	3.6	3.7	3.6
	SG 4 FW FLO	F5999A	F6464A	1-FI-541A	3.5	3.6	3.6
D					UNITS = DEG F		
	SG 1 FW NZL TEMP	T5272A	T5268A*	1-TI-2177B*	435	445	440
	SG 2 FW NZL TEMP	T5273A	T5269A*	1-TI-2178B*	435	440	445
	SG 3 FW NZL TEMP	T5274A	T5270A*	1-TI-2179B*	440	435	445
	SG 4 FW NZL TEMP	T5275A	T5271A*	1-TI-2180B*	435	445	440
E					UNITS = PSIG		
	SG 1 FW PRESS (FW HDR PRESS)	P5449A	P5264A	1-PI-2138	1040	1050	1045
	SG 2 FW PRESS	N/A	P5265A	1-PI-2139	1050	1045	1055
	SG 3 FW PRESS	N/A	P5266A	1-PI-2140	1050	1040	1045
	SG 4 FW PRESS	N/A	P5267A	1-PI-2141	1060	1050	1055

* IF Main Feedwater flow through Feedwater Isolation Valves has NOT been initiated, THEN the following indication should be substituted for feedwater temperature: T8001A (1-TI-2158), T8002A (1-TI-2159), T8003A (1-TI-2160), T8004A (1-TI-2161)

COMMENTS: _____

CANDIDATE COPY

UNIT 1 CALORIMETRIC DATA SHEET

Unit 1 Date TODAY

DATA SOURCE (Circle One): High Accuracy Computer / Normal Accuracy Computer / Normal Accuracy MCB

STEP 8.2.1	PARAMETER	HIGH ACCURACY (COMPUTER POINT)	NORMAL ACCURACY (COMPUTER POINT)	NORMAL ACCURACY (MCB INDICATOR)	DATA SETS 1 TIME:	2 TIME:	3 TIME:
F					UNITS = PSIG		
	MSL 1 PRESS CHAN II	N/A	P6401A	1-PI-515A	1005	1000	1010
	MSL 1 PRESS CHAN IV	N/A	P6402A	1-PI-516A	1000	1005	1005
	MSL 1 PRESS CHAN I	P5464A	P6400A	1-PI-514A	1010	1010	1010
	MSL 2 PRESS CHAN I	P5465A	P6420A	1-PI-524A	1005	1000	1010
	MSL 2 PRESS CHAN III	N/A	P6422A	1-PI-526A	1005	1010	1005
	MSL 2 PRESS CHAN II	N/A	P6421A	1-PI-525A	1005	1010	1005
	MSL 3 PRESS CHAN II	N/A	P6441A	1-PI-535A	1010	1010	1000
	MSL 3 PRESS CHAN I	P5466A	P6440A	1-PI-534A	1005	1000	1010
	MSL 3 PRESS CHAN III	N/A	P6442A	1-PI-536A	1000	1005	1005
	MSL 4 PRESS CHAN I	P5467A	P6460A	1-PI-544A	1005	1010	1000
	MSL 4 PRESS CHAN II	N/A	P6461A	1-PI-545A	1005	1005	1005
	MSL 4 PRESS CHAN IV	N/A	P6462A	1-PI-546A	1010	1000	1005
G					UNITS = GPM, DEG F		
	SG BLDN HX OUT FLO	F2650A	F2650A	1-FI-5219A	0	0	0
	SG BLDN HX OUT TEMP	T2650A	T2650A	1-TI-5182A	0	0	0
H					UNITS = %		
	PR CHAN I	N6049A01	N6049A01	N-41A	94.4	94.5	94.3
	PR CHAN II	N6050A01	N6050A01	N-42A	94.5	94.5	94.5
	PR CHAN III	N6051A01	N6051A01	N-43A	94.3	94.3	94.2
	PR CHAN IV	N6052A01	N6052A01	N-44A	94.1	94.2	94.1
I					UNITS = %		
	RC LOOP 1 N16 PWR CHAN I	T6503A01	T6503A01	1-JI-411A	93.5	93.9	93.8
	RC LOOP 2 N16 PWR CHAN II	T6523A01	T6523A01	1-JI-421A	93.5	93.9	94.1
	RC LOOP 3 N16 PWR CHAN III	T6543A01	T6543A01	1-JI-431A	94.1	93.7	93.8
	RC LOOP 4 N16 PWR CHAN IV	T6563A01	T6563A01	1-JI-441A	93.6	93.7	93.8

COMMENTS:

Performed By: L. ZILLI DATE: TODAY TIME: NOW

Reviewed By: DATE: TIME:

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EXAMINER KEY

CALORIMETRIC DATA REDUCTION WORKSHEET

Unit 1 Date TODAY

8.2.2.2 - Feedwater Average Temperature		
Parameter	Average Value of Data Sets (°F)	Overall Average (°F)
S/G 1 Feedwater Temperature	440	440
S/G 2 Feedwater Temperature	440	
S/G 3 Feedwater Temperature	440	
S/G 4 Feedwater Temperature	440	

8.2.2.3 Feedwater Average Pressure			
Parameter	Average of Data Sets (PSIG)	Corrected Pressure (PSIG + 14.7 = PSIA)	Overall Average (PSIA)
S/G 1 Feedwater Pressure	1045	1059.7	1063.45
S/G 2 Feedwater Pressure	1050	1064.7	
S/G 3 Feedwater Pressure	1045	1059.7	
S/G 4 Feedwater Pressure	1055	1069.7	

8.2.2.4 - Feedwater Flow Averages			
Parameter (W_F)	Average Value of Data Sets (LB/HR)	Correction Factor (CF) (NOTE 1)	Corrected Value LB/HR x CF (LB/HR)
S/G 1 Feedwater Flow	$3.6 10^6$	1	$3.6 10^6$
S/G 2 Feedwater Flow	$3.6 10^6$	1	$3.6 10^6$
S/G 3 Feedwater Flow	$3.6 10^6$	1	$3.6 10^6$
S/G 4 Feedwater Flow	$3.6 10^6$	1	$3.6 10^6$

8.2.2.5 - Corrected Steam Generator Steam Pressure Averages					
Parameter	Average of Data Sets (PSIG)	Corrected Pressure (PSIG+14.7 = PSIA)	Pressure Drop Due to Line Loss (PSIA) (NOTE 2)	Corrected Pressure (PSIA)	Overall Average (PSIA)
S/G 1 Steam Pressure	1005	1019.7	5.55	1025.25	1025.85
S/G 2 Steam Pressure	1005	1019.7	5.88	1025.58	
S/G 3 Steam Pressure	1005	1019.7	7.04	1026.74	
S/G 4 Steam Pressure	1005	1019.7	6.13	1025.83	

NOTE 1: Correction Factor is 1 when LEFM data is used. When other Feedwater Flow data is used, Correction Factor is from Attachment 10.1 using Feedwater Temperature for the associated SG calculated in Step 8.2.2.2 (Column 2).

NOTE 2: The steam line pressure drops are the same for both Units.

EXAMINER KEY

CALORIMETRIC DATA REDUCTION WORKSHEET

8.2.2.6 - Steam Generator Blowdown Average Values	
Parameter	Average Value of Data Sets
SG Blowdown Flow (GPM)	Ø
SG Blowdown Hx Out Temp (°F)	Ø

8.2.2.7 - Blowdown Flow Conversion		
Average Blowdown Flow, F (GPM)	Specific Volume, V FT^3/lbm	Blowdown Flow, F_{bd} $F_{bd} = F \times [(V)/(0.01619)]^{1/2} \times 8.021 \times 1/V$ (LBM/HR)
Ø	Ø	Ø

8.2.2.8 - Blowdown Heat Loss Calculation		
Blowdown Enthalpy, h_f (BTU/LBM)	Feedwater Enthalpy, h_w (BTU/LBM)	Blowdown Heat Loss, Q_{bd} $\Sigma Q_{bd} = (h_f - h_w)F_{bd}$ (BTU/HR)
Ø	Ø	Ø

8.2.2.9 - S/G Enthalpy Rise Calculation				
SG No.	Corrected Steam Pressure (PSIA)	Steam Enthalpy, h_g (BTU/LBM)	Feedwater Enthalpy, h_w (BTU/LBM)	Enthalpy Rise Δh $\Delta h = (h_g - h_w)$ (BTU/LBM)
1	1Ø25.25	1192	419	773
2	1Ø25.58	1192		773
3	1Ø26.74	1192		773
4	1Ø25.83	1192		773

EXAMINER KEY

CALORIMETRIC DATA REDUCTION WORKSHEET

8.2.2.10 - SG Heat Gain Calculation			
SG No.	Enthalpy Rise, Δh (BTU/LBM)	Steam Flow W_S $W_S = W_f - \left[\frac{F_{bd}}{4}\right]$ (LBM/HR)	S/G Heat Gain, Q_L $Q_L = \Delta h \times W_s$ (BTU/HR)
1	773	3.6 10^6	2.7828 10^9
2	773	3.6 10^6	2.7828 10^9
3	773	3.6 10^6	2.7828 10^9
4	773	3.6 10^6	2.7828 10^9
		ΣQ_L	1.11312 10^10

8.2.2.11 - Percent Rated Thermal Power Calculation					
SG Heat Gain ΣQ_L (BTU/HR)	Blowdown Heat Loss, ΣQ_{bd} (BTU/HR)	Non-Reactor Heat Gains, Q_{NR} (BTU/HR)	Net Reactor Power, Q_{NET} $Q_{NET} = \Sigma Q_L + \Sigma Q_{bd} - Q_{NR}$ (BTU/HR)	Rated Thermal Power, Q_{RTP} (BTU/HR)	Percent Rated Thermal Power $P_{RTP} = \frac{Q_{NET}}{Q_{RTP}} \times 100$ (%)
1.11312 10^10	Ø	5.4×10^7	1.10772 10^10	1.1802×10^{10}	93.85%

Comments: _____

Performed By: _____ Date: _____

Reviewed By: _____ Date: _____

Facility: COMANCHE PEAK Task No.:

Task Title: Perform Surveillance Procedure Review JPM No.: 2007 NRC RO Admin A.2

K/A Reference: Generic 2.2.12 3.0

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: The plant is operating at 100% power. Another operator has completed OPT-110A, Measurement of Seal Injection Flow surveillance.

Task Standard: Locate and correctly perform Critical Steps of OPT-110A.

Required Materials: OPT-110A, Measurement of Seal Injection Flow, Rev 9, PCN-1.

OPT-110A-1, Seal Injection Flow Measurement Data Sheet, Rev 8.

Initiating Cue: The Unit Supervisor has directed you to perform the following for the completed OPT-110A, Measurement of Seal Injection Flow:

- **REVIEW** values recorded on OPT-110A-1, Seal Injection Flow Measurement Data Sheet.
- **IDENTIFY** any errors on OPT-110A-1, Seal Injection Flow Measurement Data Sheet.
- **STATE** in the Discrepancies / Comments Section whether the "as completed" Surveillance is **SAT** or **UNSAT**.

Time Critical Task: N/A

Validation Time: 5 minutes

JPM SETUP

EXAMINER:

PROVIDE the Examinee with a copy of:

- **OPT-110A, Measurement of Seal Injection Flow.**
- **A completed OPT-110A-1, Seal Injection Flow Measurement Data Sheet.**

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Determine if OPT-110A, Seal Injection Flow Measurement Data Sheet Step 6.0, Prerequisites Met and Step 6.6, Test Gauge Installed was performed.

Standard: DETERMINE that OPT-110A, Seal Injection Flow Measurement Data Sheet Step 6.0, Prerequisites **were** met and Step 6.6, Test Gauge **was** installed.

Comment:

Performance Step: 2 Review Step 8.1.1 recorded data on OPT-110A, Seal Injection Flow Measurement Data Sheet.

Standard: REVIEW Step 8.1.1 recorded data on OPT-110A, Seal Injection Flow Measurement Data Sheet.

Comment:

√ **Performance Step: 3** Review Step 8.1.4 recorded data on OPT-110A, Seal Injection Flow Measurement Data Sheet for accuracy.

Standard: REVIEW Step 8.1.4 recorded data on OPT-110A, Seal Injection Flow Measurement Data Sheet for accuracy and DETERMINE:

- Acceptance Criteria for Controlling Channel Pressure is **SAT**.

Comment:

√ **Performance Step: 4** Review Step 8.1.5 calculated data on OPT-110A, Seal Injection Flow Measurement Data Sheet for accuracy.

Standard: REVIEW Step 8.1.5 calculated data on OPT-110A, Seal Injection Flow Measurement Data Sheet for accuracy and DETERMINE:

- Acceptance Criteria for Test Gauge Pressure minus Controlling Channel Pressure is **UNSAT** **(2393 psig - 2253 psig = 140 psig)**.

Comment:

Performance Step: 5 Review Step 8.1.6 recorded data on OPT-110A, Seal Injection Flow Measurement Data Sheet.

Standard:

- REVIEW Step 8.1.6 recorded data on OPT-110A, Seal Injection Flow Measurement Data Sheet.

Comment:

√ **Performance Step: 6** Review Step 8.1.7 calculated data on OPT-110A, Seal Injection Flow Measurement Data Sheet for accuracy.

Standard: REVIEW Step 8.1.7 calculated data on OPT-110A, Seal Injection Flow Measurement Data Sheet for accuracy and DETERMINE:

- Acceptance Criteria for Seal Injection Flow is **SAT**, however, **incorrect value** is recorded.
- **(8.23 gpm + 7.77 gpm + 8.18 gpm + 8.36 gpm = 32.54 gpm)**.

Comment:

√ **Performance Step: 7** Determine if Acceptance Criteria is met.

Standard: DETERMINE Acceptance Criteria **not** met for Step 8.1.5 and math error recorded for Step 8.1.7 and RECORD **UNSAT** in the Discrepancies / Comments Section of OPT-110A-1, Seal Injection Flow Measurement Data Sheet.

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC RO JPM A.2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: The plant is operating at 100% power. Another operator has completed OPT-110A, Measurement of Seal Injection Flow surveillance.

INITIATING CUE: The Unit Supervisor has directed you to perform the following for the completed OPT-110A, Measurement of Seal Injection Flow:

- **REVIEW** values recorded on OPT-110A-1, Seal Injection Flow Measurement Data Sheet.
- **IDENTIFY** any errors on OPT-110A-1, Seal Injection Flow Measurement Data Sheet.
- **STATE** in the Discrepancies / Comments Section whether the “as completed” Surveillance is **SAT** or **UNSAT**.

EXAMINER KEY

SEAL INJECTION FLOW MEASUREMENT DATA SHEET

NOTE: This form is used to record test data as required by Section 8.1 of OPT-110A.

STEP		OBSERVED	ACCEPTANCE CRITERIA	INITIALS
6.0	PREREQUISITES MET	N/A	N/A	[illegible]
6.6	TEST GAUGE INSTALLED	N/A	N/A	W
8.1.1	RECORD THE FOLLOWING:			
	• 1-FI-132, LTDN FLO	131 GPM	N/A	[illegible]
	• 1-FI-121A, CHRG FLO	137 GPM	N/A	[illegible]
	• 1-FK-121 CCP CHRG FLO CTRL	70 % OUT	N/A	[illegible]
8.1.4	RECORD THE FOLLOWING:			
	• CONTROLLING CHANNEL PRZR PRESS P648ØA (Computer Point used)	2253 PSIG	2235 ± 20 PSIG	[illegible]
	• TEST GAUGE PRESS	2393 PSIG	N/A	[illegible]
8.1.5	TEST GAUGE PRESS (STEP 8.1.4) MINUS CONTROLLING CHANNEL PRZR PRESS (STEP 8.1.4)	~~150~~ PSIG	≥145 PSIG	[illegible]
8.1.6	RECORD THE FOLLOWING (Circle instrument used)	140	UNSAT	
	• RCP 1 SEAL WTR INJ FLO F6131A/1-FR-157	8.23 GPM	N/A	[illegible]
	• RCP 2 SEAL WTR INJ FLO F6129A/1-FR-156	7.77 GPM	N/A	[illegible]
	• RCP 3 SEAL WTR INJ FLO F6127A/1-FR-155	8.18 GPM	N/A	[illegible]
	• RCP 4 SEAL WTR INJ FLO F6125A/1-FR-154	8.36 GPM	N/A	[illegible]

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SEAL INJECTION FLOW MEASUREMENT DATA SHEET

STEP		OBSERVED	ACCEPTANCE CRITERIA	INITIA
8.1.7	ADD SEAL INJ FLOWS RECORDED IN STEP 8.1.6	~~34.25~~ GPM 32.54	≤39.5 GPM SAT	[illegible]
9.0	RESTORATION			
9.1.2	1-FK-121 IN AUTO	N/A	N/A	[illegible]
9.1.3	TEST GAUGE REMOVED	N/A	N/A	[illegible]
9.1.4	INDEPENDENT VERIFICATION			
	• TEST GAUGE REMOVED	N/A	N/A	[illegible]
	• 1-FK-121 IN AUTO	N/A	N/A	[illegible]

N/A if section 8.2 is performed.

DISCREPANCIES/COMMENTS: UNSAT – INSUFFICIENT ΔP AT STEP 8.1.5 / MATH ERROR AT STEP 8.1.7.

CORRECTIVE ACTIONS: _____

PERFORMED BY: [illegible] DATE: TODAY
SIGNATURE

REVIEWED BY: _____ DATE: _____
OPERATIONS MANAGEMENT

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Facility: COMANCHE PEAK Task No.:

Task Title: Perform a Safety Function Determination JPM No.: 2007 NRC SRO Admin A.2

K/A Reference: Generic 2.2.22 4.1

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: Unit 2 is in MODE 1. The Train A Component Cooling Water Pump 2-01 is out-of-service for maintenance due to breaker failure. During rounds in the Unit 2 Auxiliary Building the PEO observes a boron stalactite hanging from the Residual Heat Removal Pump 2-02 casing. A dye penetrant test performed by Maintenance reveals a series of hairline cracks in the RHR Pump casing.

Task Standard: Locate and correctly perform Critical Steps of ODA-308.

Required Materials: ODA-308, LCO Tracking Program, Rev 11, PCN-5.

Unit 2 Technical Specifications

Initiating Cue: The Shift Manager has directed you to **COMPLETE** a Safety Function Determination per ODA-308, LCO Tracking Program. **IDENTIFY** and **RECORD** the following parameters:

- *Inoperable* Equipment: _____
- Previously *Inoperable* Equipment: _____
- Safety Function Affected: _____
- Supported System(s) Impacted: _____
- SFDP Assessment (SAT/UNSAT): _____

Time Critical Task: N/A

Validation Time: 10 minutes

JPM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **ODA-308, LCO Tracking Program.**
- **Unit 2 Technical Specifications.**

(Denote Critical Steps with a check mark)

START TIME: _____

√ **Performance Step: 1** Determine the *inoperable* system or component.

Standard: DETERMINE that the **Train B RHR System** is the ***inoperable* equipment**.

Comment:

Performance Step: 2 Determine the previously *inoperable* system or component.

Standard: DETERMINE that the **Train A CCW System** is the **previously *inoperable* equipment**.

Comment:

√ **Performance Step: 3** Determine the Safety Function Affected by the *inoperable* system or component.

Standard: DETERMINE that **removal of decay heat (mitigate the consequences of primary and secondary accidents as part of ECCS)** is the **Safety Function Affected**.

Comment:

Performance Step: 4 Determine the Supported System(s) Impacted by the *inoperable* system or component.

Standard: DETERMINE that **ECCS** is the **Supported System Impacted** by the *inoperable* system or component.

Comment:

√ **Performance Step: 5** Determine the Safety Function Determination Program (SFDP) Assessment for the *inoperable* system or component.

Standard: DETERMINE that the **SFDP Assessment** for the *inoperable* system or component is **UNSAT**.

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC SRO Admin A.2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: Unit 2 is in MODE 1. The Train A Component Cooling Water Pump 2-01 is out-of-service for maintenance due to breaker failure. During rounds in the Unit 2 Auxiliary Building the PEO observes a boron stalactite hanging from the Residual Heat Removal Pump 2-02 casing. A dye penetrant test performed by Maintenance reveals a series of hairline cracks in the RHR Pump casing.

INITIATING CUE: The Shift Manager has directed you to **COMPLETE** a Safety Function Determination per ODA-308, LCO Tracking Program. **IDENTIFY** and **RECORD** the following parameters:

- *Inoperable* Equipment: _____
- Previously *Inoperable* Equipment: _____
- Safety Function Affected: _____
- Supported System(s) Impacted: _____
- SFDP Assessment (SAT/UNSAT): _____

Facility: COMANCHE PEAK Task No.:

Task Title: Calculate Stay Time JPM No.: 2007 NRC JPM A.3

K/A Reference: Generic 2.3.10 2.9 / 3.3

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: Given the following information:

- A high dose maintenance activity is scheduled in the Unit 1 Reactor Building.
- The general dose rate in the area is 150 mrem/hour but can be reduced to 50 mrem/hour if lead shielding is installed.
- It will take Plant Equipment Operators (PEO) Alpha & Bravo one and a half (1.5) hours to install the shielding if desired.
- Independent of the shielding, it will take PEO Alpha five and a half (5.5) hours or PEOs Alpha & Bravo three (3.0) hours to perform the maintenance.

Task Standard: Correctly perform calculation of Critical Steps for the JPM.

Required Materials: Calculator

General References: RPI-602, Radiological Surveillance and Posting, Rev. 29.

Initiating Cue: The Work Process Supervisor has directed you to **CALCULATE** the condition with the **lowest total combined dose** to perform the maintenance then **CIRCLE** your answer.

- PEO Alpha **without** shielding.
- PEOs Alpha & Bravo **without** shielding.
- PEO Alpha **with** shielding.
- PEOs Alpha & Bravo **with** shielding.

Time Critical Task: N/A

Validation Time: 8 minutes

JPM SETUP

EXAMINER:

PROVIDE the Examinee with a calculator.

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Determine total dose to PEO Alpha without shielding.

Standard: DETERMINE total dose to PEO Alpha without shielding as follows:

- 150 mrem/hr x 5.5 hours = **825 mrem total dose.**

Comment:

Performance Step: 2 Determine total combined dose to PEOs Alpha & Bravo without shielding.

Standard: DETERMINE total combined dose to PEOs Alpha & Bravo without shielding as follows:

- 150 mrem/hr x 3.0 hours/PEO x 2 PEOs = **900 mrem total dose.**

Comment:

Performance Step: 3 Determine total dose to install shielding.

Standard: DETERMINE total dose to install shielding as follows:

- 150 mrem/hr x 1.5 hours/PEO x 2 PEOs = **450 mrem to install.**

Comment:

Performance Step: 4 Determine total dose to PEO Alpha with shielding.

Standard: DETERMINE total dose to PEO Alpha with shielding as follows:

- 50 mrem/hr x 5.5 hours + 450 mrem = **725 mrem total dose.**

Comment:

Performance Step: 5 Determine total combined dose to PEOs Alpha & Bravo with shielding.

Standard: DETERMINE total combined dose to PEOs Alpha & Bravo with shielding as follows:

- 50 mrem/hr x 3.0 hours/PEO x 2 PEOs + 450 mrem = **750 mrem total dose.**

Comment:

√ **Performance Step: 6** Select the appropriate individual.

Standard: DETERMINE total dose to PEO Alpha with shielding at a total dose of **725 mrem** is the most desirable selection.

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM A.3

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: Given the following information:

- A high dose maintenance activity is scheduled in the Unit 1 Reactor Building.
- The general dose rate in the area is 150 mrem/hour but can be reduced to 50 mrem/hour if lead shielding is installed.
- It will take Plant Equipment Operators (PEO) Alpha & Bravo one and a half (1.5) hours to install the shielding if desired.
- Independent of the shielding, it will take PEO Alpha five and a half (5.5) hours or PEOs Alpha & Bravo three (3.0) hours to perform the maintenance.

INITIATING CUE: The Work Process Supervisor has directed you to **CALCULATE** the condition with the **lowest total combined dose** to perform the maintenance then **CIRCLE** your answer.

- PEO Alpha **without** shielding.
- PEOs Alpha & Bravo **without** shielding.
- PEO Alpha **with** shielding.
- PEOs Alpha & Bravo **with** shielding.

Facility: COMANCHE PEAK Task No.:

Task Title: Classify an Emergency Event JPM No.: 2007 NRC JPM A.4

K/A Reference: Generic 2.4.41 2.3 / 4.1

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: _____

Classroom _____ Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: The Unit 2 Reactor is shutting down due to a Technical Specification LCO 3.0.3 ACTION associated with the Auxiliary Feedwater System. You have just been informed by Site Security that a Miami-bound aircraft has diverted from its flight plan leaving the Dallas-Fort Worth Airport 15 minutes ago and is headed in a Southwesterly direction. The NRC has contacted the Control Room and confirmed the validity of an airborne attack on the CPSES site.

Task Standard: Correctly classify the Security Event per EPP-201.

Required Materials: EPP-201, Assessment of Emergency Action Levels Emergency Classification and Plan Activation, Rev. 11, PCN-2.

Initiating Cue: The Shift Manager directs you to **CLASSIFY** the event using EPP-201, Assessment of Emergency Action Levels Emergency Classification and Plan Activation.

Time Critical Task: N/A

Validation Time: 5 minutes

JPM SETUP

EXAMINER:

PROVIDE the Examinee with a copy of:

- **EPP-201, Assessment of Emergency Action Levels Emergency Classification and Plan Activation.**

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Determine the Event Category.

Standard: Using EPP-201 Attachment 1 Flowcharts, DETERMINE event to be a Loss of Plant Control / Security Compromise.

Comment:

Performance Step: 2 Match plant conditions with the Emergency Action Levels (EALs) listed in the Event Classification Flowcharts.

Standard: REVIEW EAL descriptions and DETERMINE event is **Loss of Plant Control / Security Compromise**.

Comment:

Performance Step: 3 Review the Flowpath Conditions preceding / following the selected EAL to find the highest level applicable EAL.

Standard: DETERMINE Flowpath Conditions for **Loss of Plant Control / Security Compromise** are **7.A, 7.B, and 7.C.**

Comment:

√ **Performance Step: 4** Classify the emergency using the highest applicable Event Code.

Standard: Given Flowpath Conditions **7.A, 7.B, and 7.C,** CLASSIFY event as an **Alert**.

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM A.4

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: The Unit 2 Reactor is shutting down due to a Technical Specification LCO 3.0.3 ACTION associated with the Auxiliary Feedwater System. You have just been informed by Site Security that a Miami-bound aircraft has diverted from its flight plan leaving the Dallas-Fort Worth Airport 15 minutes ago and is headed in a Southwesterly direction. The NRC has contacted the Control Room and confirmed the validity of an airborne attack on the CPSES site.

INITIATING CUE: The Shift Manager directs you to **CLASSIFY** the event using EPP-201, Assessment of Emergency Action Levels Emergency Classification and Plan Activation.

Facility: COMANCHE PEAK Task No.:

Task Title: Load Diesel Generator JPM No.: 2007 NRC JPM S-1

K/A Reference: SF6.064.A4.06 3.9 / 3.9

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: OPT-214A, Diesel Generator Operability Test is being performed on DG 1-01 for a normal 30 day test. The PEO at the DG has reported that the DG is running properly at 60 Hz and 6900 Volts. The Diesel Generator has been running for 60 minutes to allow Maintenance to obtain cylinder firing pressures.

Task Standard: Locate and correctly perform Critical Steps of OPT-214A.

Required Materials: OPT-214A, Diesel Generator Operability Test, Rev. 19, PCN-3.

Initiating Cue: The Unit Supervisor directs you to continue with OPT-214A, Diesel Generator Operability Test starting at Step 8.1.Q.

Time Critical Task: N/A

Validation Time: 10 minutes

SIMULATOR SETUP

BOOTH OPERATOR:

EXECUTE any at power Initial Condition and then PERFORM the following:

- **START DG 1-01 using the NORMAL START Switch and ENSURE voltage and frequency NOT matched.**
- **As DG is loaded to 6 MWe, INSERT Malfunction ED09 to 58.5 Hz with a 30 second ramp.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **OPT-214A, Diesel Generator Operability Test.**
- **MARK UP procedure (INITIAL and/or N/A) as appropriate up to Step 8.1.Q.**

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Refer to OPT-214A, Step 8.1.Q.

Standard: REFER to OPT-214A, Step 8.1.Q.

Comment:

√ **Performance Step: 2** Turn SS-1EG1, BKR 1EG1 SYNCHROSCOPE to ON.

Standard: PLACE SS-1EG1, BKR 1EG1 SYNCHROSCOPE in the ON position and OBSERVE synchroscope rotating slowly.

Comment:

Performance Step: 3 Using 90-1EG1, DG 1 VOLT CTRL, gradually adjust V-IN on the synchroscope 1 to 2 volts higher than V-RUN on the synchroscope.

Standard: OBSERVE V-IN, Incoming Volts **and** V-RUN, Running Volts and gradually ADJUST 90-1EG1, DG 1 VOLT CTRL to obtain V-IN 1 to 2 volts higher than V-RUN on the synchroscope.

Comment:

√ **Performance Step: 4** Using 65-1EG1, DG 1 SPD CTRL, adjust speed so the synchroscope is moving 2 to 4 RPM in the fast direction.

Standard: ADJUST 65-1EG1, DG 1 SPD CTRL in the RAISE or LOWER direction until synchroscope is rotating slowly in FAST direction at 2 to 4 rpm.

Comment:

√ **Performance Step: 5** Close CS-1EG1, DG 1 BKR 1EG1 when the synchroscope is slightly before the 12 o'clock position and moving slowly in the fast direction.

Standard: With the synchroscope slightly before 12 o'clock and moving slowly in the FAST direction, PLACE CS-1EG1, DG 1 BKR 1EG1 in the CLOSE position and OBSERVE the red CLOSE light illuminated.

Comment:

√ **Performance Step: 6** Immediately load the DG to 2.2 - 2.5 MW for stability by moving 65-1EG1, DG 1 SPD CTRL in the RAISE direction.

Standard: Immediately PLACE 65-1EG1, DG 1 SPD CTRL in the RAISE position to pick up 2.2 to 2.5 MWe load.

Comment:

Performance Step: 7 Turn SS-1EG1, BKR 1EG1 SYNCHROSCOPE to OFF.

Standard: PLACE SS-1EG1, BKR 1EG1 SYNCHROSCOPE in the OFF position.

Comment:

Performance Step: 8 Maintain 0-500 KVAR out by adjusting 90-1EG1, DG 1 VOLT CTRL while continuing with this procedure.

Standard: ADJUST 90-1EG1, DG 1 VOLT DG1 handswitch as required to maintain 0 to 500 KVAR.

Comment:

Performance Step: 9 Initiate form TSP-503-1 AND notify the organizations listed below that the DG has been started:

- Initiate TSP-503-1
- Prompt Team
- Chemistry

Standard: INITIATE form TSP-503-1 and NOTIFY the Prompt Team and Chemistry that the DG has been started.

Evaluator's Cue: **Another operator will complete the forms and notifications.**

Comment:

√ **Performance Step: 10** Load the DG to 6.0 MW over the next 20 minutes using 65-1EG1, DG 1 SPD CTRL, unless otherwise directed by the Shift Manager.

Standard: PLACE 65-1EG1, DG 1 SPD CTRL in the RAISE position to increase load to 6.0 MWe while OBSERVING W-1EG1, DG1 MW Meter.

Booth Operator Cue: **INSERT Malfunction ED09 to 58.5 Hz with a 30 second ramp.**

Evaluator's Note: **At this point the DG will start to increase load without any action of the operator. The candidate will perform the Continuous Action Step at Step 8.1.T.**

Evaluator's Note: **The following step represents the Alternate Path of this JPM.**

Comment:

√ **Performance Step: 11** IF the termination criteria of Attachment 10.7, Section II are met while the DG is synchronized with the offsite power source, THEN perform the following:

- Open CS-1EG1, DG1 BKR 1EG1, **or**
- Initiate an Emergency Stop by placing CS-1DG1E, EMER STOP/START in the STOP or PULLOUT position.

Standard: RECOGNIZE offsite power frequency is degrading and PERFORM either of the following:

- PLACE CS-1EG1, DG1 BKR 1EG1 in TRIP and OBSERVE the green TRIP light illuminated.
- PLACE CS-1DG1E, EMER STOP/START in the STOP or PULLOUT position.

Evaluator's Note: **The candidate can choose to either open the output breaker or emergency stop the DG per OPT-214A.**

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM S-1

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: OPT-214A, Diesel Generator Operability Test is being performed on DG 1-01 for a normal 30 day test. The PEO at the DG has reported that the DG is running properly at 60 Hz and 6900 Volts. The Diesel Generator has been running for 60 minutes to allow Maintenance to obtain cylinder firing pressures.

INITIATING CUE: The Unit Supervisor directs you to continue with OPT-214A, Diesel Generator Operability Test starting at Step 8.1.Q.

Facility: COMANCHE PEAK Task No.:

Task Title: Start the 3rd Reactor Coolant Pump JPM No.: 2007 NRC JPM S-2

K/A Reference: SF4P.003.A4.06 2.9 / 2.9

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: The Unit is performing a Reactor Coolant System heatup and preparations for starting RCP 3 are complete up to Step 5.1.G of SOP-108A, Reactor Coolant Pump.

Task Standard: Locate and correctly perform Critical Steps of SOP-108A.

Required Materials: SOP-108A, Reactor Coolant Pump, Rev. 11, PCN-3.

Initiating Cue: The Unit Supervisor directs you to start Reactor Coolant Pump 3 per SOP-108A, Reactor Coolant Pump, starting at Step 5.1.H.

Time Critical Task: N/A

Validation Time: 10 minutes

SIMULATOR SETUP

BOOTH OPERATOR:

EXECUTE IC-4 and then PERFORM the following:

- **PLACE RCP #3 on Plant Computer System Trend.**
- **INSERT Remote Function AORCIIRCP3 set to 800 amps upon pump start.**
- **ADJUST 1-HS-4573 and 1-HS-4575 to FULL OPEN to bring the RCP 3 cooling water flows into specification.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **SOP-108A, Reactor Coolant Pump.**
- **MARK UP procedure (INITIAL and/or N/A) as appropriate up to Step 5.1.H.**

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Verify the alarms on 1-ALB-5A are clear.

- 1.2 ANY RCP SEAL 1 LKOFF FLO HI
- 1.6 ANY RCP SEAL WTR INJ FLOW LO
- 2.2 ANY RCP SEAL 1 ΔP LO
- 3.1 ANY RCP SEAL WTR STANDPIPE LVL HI
- 3.2 ANY RCP SEAL 2 LKOFF FLO HI
- 4.1 ANY RCP SEAL WTR STANDPIPE LVL LO
- 3.4 RCP 3 UP BRG L/O RESVR LVL HI/LO
- 3.5 RCP 3 LOW BRG L/O RESVR LVL HI/LO

Standard: OBSERVE 1-ALB-5A RCP alarms 1.2, 1.6. 2.2, 3.1, 3.2, 3.4, 3.5 and 4.1 are clear.

Comment:

Performance Step: 2 Verify the following cooling water flows normal.

- RCP 1-4 UP BRG L/O CLR CCW RET FLO 170 gpm (150 gpm to 190 gpm).
    - 1-FI-4683, RCP 3

Standard: OBSERVE 1-FI-4683, RCP 3 UP BRG L/O CLR CCW RET FLO between 150 and 190 gpm.

Comment:

Performance Step: 3 Verify the following cooling water flows normal.

- RCP 1-4 LOW BRG L/O CLR CCW RET FLO 6 gpm (5 to 6 gpm)
    - 1-FI-4685, RCP 3

Standard: OBSERVE 1-FI-4685, RCP 3 LOW BRG L/O CLR CCW RET FLO between 5 and 6 gpm.

Comment:

Performance Step: 4 Verify the following cooling water flows normal.

- RCP 1-4 MOTOR AIR CLR CCW RET FLO 360 gpm (340 gpm to 380 gpm).
    - 1-FI-4684, RCP 3

Standard: OBSERVE 1-FI-4684, RCP 3 MOTOR AIR CLR CCW RET FLO between 340 and 380 gpm.

Comment:

Performance Step: 5 Verify the following cooling water flows normal.

- RCP 1-4 THBR CLR CCW RET FLO 45 gpm (35 gpm to 55 gpm).
    - 1-FI-4686, RCP 3

Standard: OBSERVE 1-FI-4686, RCP 3 THBR CLR CCW RET FLO between 35 and 55 gpm.

Comment:

Performance Step: 6 Initiate trending of data on the computer for the affected RCP(s) per Attachment 1, if not previously done.

Standard: OBSERVE that RCP 3 is already on a Plant Computer System trend.

Evaluator's Cue: **If necessary, point out the PCS trend for RCP 3.**

Comment:

Performance Step: 7 Ensure the breaker for the RCP(s) to be started is racked in.

- 1PCPX3, Reactor Coolant Pump 1-03 Motor Breaker (Bus 1A3 CUB 2)

Standard: DETERMINE 1PCPX3, Reactor Coolant Pump 1-03 Motor Breaker is racked in by OBSERVING light indications.

Comment:

Performance Step: 8 Ensure the Overcurrent Trip Selector switch for the RCP(s) to be started is in the COLD LOOP position.

- 1PCPX3, Reactor Coolant Pump 1-03 Motor Breaker (Bus 1A3 CUB 2)

Standard: DISPATCH a PEO to check 1PCPX3, Reactor Coolant Pump 1-03 Motor Breaker Overcurrent Trip Selector switch is placed in the "COLD LOOP" position.

Evaluator's Cue: **The PEO reports Unit 1 RCP 3 breaker Overcurrent Trip Selector switch is in the "COLD LOOP" position.**

Comment:

Performance Step: 9 IF the selected RCP(s) is accessible, THEN station personnel to observe the pump for normal operation.

Standard: DETERMINE if the RCP is accessible.

Evaluator's Cue: **The RCP is not accessible.**

Comment:

√ **Performance Step: 10** Start the associated oil lift pump two minutes before starting the RCP.

- 1/1-PCPX3-LP, RCP 3 OIL LIFT PMP

Standard: PLACE 1/1-PCPX3-LP, RCP 3 OIL LIFT PMP to START and OBSERVE red START light illuminated and MARKS time for 2 minute run.

Evaluator's Cue: **Two minutes have elapsed.**

Comment:

Performance Step: 11 Observe OIL PRESS permissive interlock (blue light) lit.

- 1/1-PCPX3-LP, RCP 3 OIL LIFT PMP

Standard: OBSERVE 1/1-PCPX3-LP, RCP 3 OIL LIFT PMP blue OIL PRESS light illuminated.

Comment:

√ **Performance Step: 12** Start the selected RCP.

- 1/1-PCPX3, RCP 3

Standard: PLACE 1/1-PCPX3, RCP 3 handswitch to START and OBSERVE red PUMP light illuminated.

Comment:

Performance Step: 13 Perform the following to check for proper start of the RCP.

- Verify alarm 2.1 on 1-ALB-5B, ANY RCP FAIL TO START OR ACCELERATE, is clear.

Standard: VERIFY 1-ALB-5B-2.1, ANY RCP FAIL TO START OR ACCELERATE, is not in alarm.

Comment:

Performance Step: 14 Perform the following to check for proper start of the RCP.

- Verify the associated RCP Undervoltage TSLB goes out.
    - RCP 3 BUS UNDERVOLT, 1-TSLB-4-3.2

Standard: VERIFY 1-TSLB-4-3.2, RCP 3 BUS UNDERVOLT, white light NOT illuminated.

Comment:

Performance Step: 15 Perform the following to check for proper start of the RCP.

- IF loop flow does not increase within 10 seconds, THEN stop the RCP.
    - 1-FI-434/35/36, RC LOOP 3 FLO

Standard: VERIFY 1-FI-434/35/36, RC LOOP 3 FLO increases within 10 seconds.

Comment:

Performance Step: 16 Perform the following to check for proper start of the RCP.

- IF current does not decay to less than or equal to 750 amps within one minute after startup, THEN stop the RCP.
  - 1-II-RCP3, RCP 3 MOTOR CURRENT

Standard: DETERMINE 1-II-RCP3, RCP3 MOTOR CURRENT is ~800 amps and OBSERVE it does not decrease within 1 minute.

Evaluator's Note: **The following step represents the Alternate Path of this JPM.**

Comment:

√ **Performance Step: 17** Stop #3 RCP.

Standard: PLACE 1/1-PCPX3, RCP 3 handswitch to STOP and OBSERVE green STOP light illuminated.

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM S-2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: The Unit is performing a Reactor Coolant System heatup and preparations for starting RCP 3 are complete up to Step 5.1.G of SOP-108A, Reactor Coolant Pump.

INITIATING CUE: The Unit Supervisor directs you to start Reactor Coolant Pump 3 per SOP-108A, Reactor Coolant Pump, starting at Step 5.1.H.

Facility: COMANCHE PEAK Task No.:

Task Title: Respond to a Power Range Channel Malfunction JPM No.: 2007 NRC JPM S-3

K/A Reference: SF7.015.A2.01 3.5 / 3.9

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: The unit is at ~50% power and Power Range Instrument N-44 has failed high.

Task Standard: Locate and correctly perform Critical Steps of ABN-703.

Required Materials: ABN-703, Power Range Instrument Malfunction, Rev. 8, PCN-4.

Initiating Cue: The Unit Supervisor directs you to perform actions per ABN-703, Power Range Instrument Malfunction starting at Step 4.

Time Critical Task: N/A

Validation Time: 5 minutes

SIMULATOR SETUP

BOOTH OPERATOR:

EXECUTE IC-14 or any 50% power Initial Condition and then PERFORM the following:

- **INSERT Malfunctions NI06E, PR N-44 Channel Failure to 200%.**
- **ENSURE Control Rods are in AUTO.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-703, Power Range Instrument Malfunction.**
- **MARK UP procedure (INITIAL and/or N/A) as appropriate up to Step 2.3.4.**

(Denote Critical Steps with a check mark)

START TIME: _____

√ **Performance Step: 1** Perform the following for failed channel:

- At DETECTOR CURRENT COMPARATOR drawer, select ROD STOP BYPASS switch to failed channel.

Standard: At Detector Current Comparator N-50 Drawer, SELECT Rod Stop Bypass switch to BYPASS PRN44.

Comment:

√ **Performance Step: 2** Perform the following for failed channel:

- At COMPARATOR AND RATE drawer, select COMPARATOR CHANNEL DEFEAT switch to failed channel.

Standard: At Comparator and Rate N37/N46 Drawer, SELECT Comparator Channel Defeat switch to N44.

Comment:

√ **Performance Step: 3** Perform the following for failed channel:

- At DETECTOR CURRENT COMPARATOR Drawer, select UPPER SECTION switch to failed channel.

Standard: At Detector Current Comparator drawer N-50, SELECT Upper Section switch to PRN44.

Comment:

√ **Performance Step: 4** Perform the following for failed channel:

- At DETECTOR CURRENT COMPARATOR Drawer, select LOWER SECTION switch to failed channel.

Standard: At Detector Current Comparator drawer N-50, SELECT Lower Section switch to PRN44.

Comment:

√ **Performance Step: 5** Perform the following for failed channel:

- At DETECTOR CURRENT COMPARATOR drawer, select POWER MISMATCH BYPASS switch to failed channel.

Standard: At Detector Current Comparator drawer N-50, SELECT Power Mismatch Bypass switch to BYPASS PRN44.

Comment:

√ **Performance Step: 6** Perform the following for failed channel:

- At POWER RANGE A drawer, select RATE MODE switch momentarily to RESET for failed channel.

Standard: At Power Range Drawer A N-44A, SELECT Rate Mode switch momentarily to RESET for N44.

Comment:

√ **Performance Step: 7** Perform the following for failed channel:

- Select the following switches to loop corresponding to failed channel:
  - 1/1-JS-411E, N16 PWR CHAN DEFEAT (CB-05)

Standard: PLACE 1/1-JS-411E, N16 PWR CHAN DEFEAT (CB-05) in Loop 4 position.

Comment:

√ **Performance Step: 8** Perform the following for failed channel:

- Select the following switches to loop corresponding to failed channel:
  - 1-TS-412T, Tave CHAN DEFEAT (CB-07)

Standard: PLACE 1-TS-412T, Tave CHAN DEFEAT (CB-07) in Loop 4 position.

Comment:

Performance Step: 9 Ensure N16 Recorder selected to - OPERABLE CHANNEL:

- 1/1-TS-411E, 1-TR-411 CHAN SELECT.

Standard: SELECT 1/1-TS-411E, 1-TR-411 CHAN SELECT N16 Recorder to any channel other than Loop 4.

Comment:

Terminating Cue: **Another operator will perform QPTR calculations. This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM S-3

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: The Unit is at ~50% power and Power Range Instrument N-44 has failed high.

INITIATING CUE: The Unit Supervisor directs you to perform actions per ABN-703, Power Range Instrument Malfunction starting at Step 4.

Facility: COMANCHE PEAK Task No.:

Task Title: Startup of B MFW Pump JPM No.: 2007 NRC JPM S-4

K/A Reference: SF4S.059.A4.02 2.3 / 2.4

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: The A Main Feedwater Pump is running and all steps in SOP-302A, Feedwater System have been completed. The B Main Feedwater Pump is running at 2000 rpm.

Task Standard: Locate and correctly perform Critical Steps of IPO-003A.

Required Materials: IPO-003A, Power Operations, Rev. 24, PCN-13.

Initiating Cue: The Unit Supervisor directs you to place the B Main Feedwater Pump in service per IPO-003A, Power Operations starting at Step 5.4.19.

Time Critical Task: N/A

Validation Time: 14 minutes

SIMULATOR SETUP

BOOTH OPERATOR:

EXECUTE IC-14 or any 50% power Initial Condition with the 2nd Feedwater Pump ready to be placed in service and then PERFORM the following:

- **PLACE the Digital Feedwater System (DFS) Summary Screen in service.**
- **ENSURE B MFW Pump is at ~2000 rpm.**
- **ENSURE drain valves 1-HS-2173 and 1-HS-2176 are closed.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **IPO-003A, Power Operations.**
- **MARK UP procedure (INITIAL and/or N/A) as appropriate up to Step 5.4.19.**

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Review NOTE prior to Step 5.4.19.

Standard: REVIEW NOTE prior to Step 5.4.19.

Comment:

Performance Step: 2 Verify the following controllers are in AUTO:

- 1-SK-509A, FWP MASTER SPEED CTRL.

Standard: VERIFY 1-SK-509A, FWPT MASTER SPEED CTRL in AUTO with the white AUTO light illuminated.

Comment:

Performance Step: 3 Verify the following controllers are in AUTO:

- 1-SK-509B, FWPT A AUTO SPD CTRL.

Standard: VERIFY 1-SK-509B, FWPT A AUTO SPD CTRL in AUTO with the white AUTO light illuminated.

Comment:

Performance Step: 4 Verify the following controllers are in AUTO:

- 1-SK-509C, FWPT B AUTO SPD CTRL.

Standard: VERIFY 1-SK-509C, FWPT B AUTO SPD CTRL in AUTO with the white AUTO light illuminated.

Comment:

√ **Performance Step: 5** Place the oncoming FWP recirculation valve in MANUAL and open it as required to obtain 5000 gpm suction flow, or fully open the valve (100% demand) if 5000 gpm cannot be achieved.

- 1-FK-2290, SG FW PMP B RECIRC CTRL

Standard: DEPRESS amber MAN pushbutton and OBSERVE amber Manual light illuminated then DEPRESS red OUTPUT ▲ pushbutton on 1-FK-2290, SG FW PMP B RECIRC FLO CTRL until 1-FI-2290, FWP B SUCT FLO reads 5000 gpm.

Comment:

Performance Step: 6 Perform the following steps alternately in controlled, incremental steps until the recirc valve for the oncoming FWP is closed.

- Adjust speed on the oncoming FWP to approach that of the running FWP while maintaining its speed **at or below** that of the running FWP.
- Close down on the oncoming FWP recirc valve as much as possible without decreasing flow for the oncoming FWP below 5000 gpm.

Standard: PERFORM the following:

- PLACE 1-SC-2112B FWPT B MAN SPD CTRL in the SLOW RAISE or FAST RAISE position and OBSERVE 1-SI-2112F, FWPT SPD increasing.
- DEPRESS red OUTPUT ▼ pushbutton on 1-FK-2290, SG FW PMP B RECIRC FLO CTRL as necessary to maintain 1-FI-2290, FWP B SUCT FLO at 5000 gpm.

Evaluator's Note: **B MFW Pump speed can momentarily be > A MFW Pump speed during performance of the above step.**

Comment:

√ **Performance Step: 7** When the oncoming FWP Recirc Valve indicates closed, place the controller in AUTO:

- 1-FK-2290, SG FW PMP B RECIRC CTRL

Standard: DEPRESS 1-FK-2290, SG FW PMP B RECIRC CTRL white AUTO pushbutton and OBSERVE the white AUTO light illuminated.

Comment:

Performance Step: 8 NOTE: If desired, the pot setting for the oncoming FWP may be adjusted to match FW REF to the current SPD CMD as indicated on the DFS screen to facilitate a bumpless transfer to automatic control.

Standard: If required, ROTATE the POT Setpoint on 1-SK-509C, FWPT B AUTO SPD CTRL to match FW REF speed to SPD CMD speed on the Digital Feedwater System Summary Screen.

Comment:

√ **Performance Step: 9** When the oncoming FWP FW REF and SPD CMD are approximately the same on the DFS screen, depress the FWPT SPD CTRL MODE SELECT AUTO pushbutton.

- 1-HS-2112B, FWPT B SPD CTRL MODE SELECT - AUTO

Standard: DEPRESS 1-HS-2112B, FWPT B SPD CTRL MODE SELECT black AUTO pushbutton and OBSERVE the white AUTO light illuminated.

Comment:

Performance Step: 10 Adjust the FWPT AUTO SPD CTRL Pots as required to balance load and flow.

- 1-SK-509C, FWPT B AUTO SPD CTRL

Standard: ADJUST the POT Setpoint on 1-SK-509C, FWPT B AUTO SPD CTRL to balance both Main Feedwater Pump flows.

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JMP S-4

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: The A Main Feedwater Pump is running and all steps in SOP-302A, Feedwater System have been completed. The B Main Feedwater Pump is running at 2000 rpm.

INITIATING CUE: The Unit Supervisor directs you to place the B Main Feedwater Pump in service per IPO-003A, Power Operations starting at Step 5.4.19.

Facility: COMANCHE PEAK Task No.:

Task Title: Transfer Containment Spray From Injection to Recirculation JPM No.: 2007 NRC JPM S-5

K/A Reference: SF5.026.A4.01 4.5 / 4.3

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: A Large Break LOCA has occurred. EOS-1.3A, Transfer to Cold Leg Recirculation has been performed through Step 3.

Task Standard: Locate and correctly perform Critical Steps of EOS-1.3A.

Required Materials: EOS-1.3A, Transfer to Cold Leg Recirculation, Rev. 8.

Initiating Cue: The Unit Supervisor has directed you to transfer Containment Spray to the Containment Sumps per EOS-1.3A, Transfer to Cold Leg Recirculation starting at Step 4.

Time Critical Task: N/A

Validation Time: 5 minutes

SIMULATOR SETUP

BOOTH OPERATOR:

EXECUTE IC #65, Post LOCA with RHR swap over complete and then PERFORM the following:

- **INSERT Remote Function to fail 1-HS-4783 in the CLOSE position.**

If IC #65 is not available, RESET to any at power IC, then PERFORM the following:

- **INSERT Malfunction RC09A2 (or equivalent LB LOCA).**
- **PLACE Simulator in RUN.**
- **REDUCE AFW Flow to all SGs.**
- **RESET SI, SIS, Phase A, B and Containment Spray.**
- **STOP the EDGs.**
- **STOP the RCPs.**
- **PERFORM Steps 1-3 of EOS 1.3.**
- **When RWST level reaches LO-LO level, TRANSFER ECCS to Cold Leg Recirculation.**
- **INSERT Remote Function to fail 1-HS-4783 in the CLOSE position.**
- **FREEZE simulator when RWST level 24%.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **EOS-1.3A, Transfer to Cold Leg Recirculation.**
- **MARK UP procedure (INITIAL and/or N/A) as appropriate up to Step 4.**

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Check RWST level - LESS THAN 24%.

Standard: OBSERVE 1-LI-930, RWST LVL CHAN 1 or 1-LI-931, RWST LVL CHAN 2 and VERIFY level is < 24%.

Comment:

√ **Performance Step: 2** Open CNTMT SMP TO CSP 1 & 3 AND 2 & 4 SUCT ISOL VLVs:

- 1-HS-4782

Standard: PLACE 1-HS-4782, CNTMT SMP TO CSP 1 & 3 to OPEN position and OBSERVE red OPEN light illuminated.

Comment:

√ **Performance Step: 3** Open CNTMT SMP TO CSP 1 & 3 AND 2 & 4 SUCT ISOL VLVs:

- 1-HS-4783

Standard: PLACE 1-HS-4783, CNTMT SMP TO CSP 2 & 4 to OPEN position and OBSERVE valve fails closed with green CLOSE light illuminated.

Evaluator's Note: **The following two steps represent the Alternate Path of this JPM.**

Comment:

√ **Performance Step: 4** IF CNTMT SMP TO CSP VLV(s) can NOT be open, THEN perform the following:

- Place affected CSPs in PULL-OUT.

Standard: PERFORM the following:

- PLACE 1-HS-4766, CSP 2 in STOP then PULLOUT and OBSERVE all lights extinguished.
- PLACE 1-HS-4767, CSP 4 in STOP then PULLOUT and OBSERVE all lights extinguished.

Comment:

√ **Performance Step: 5** IF CNTMT SMP TO CSP VLV(s) can NOT be open, THEN perform the following:

- Place affected CS HX OUT VLV(s) in PULL-OUT.

Standard: PLACE 1-HS-4777, CS HX 2 OUT VLV to CLOSE then PULLOUT and OBSERVE all lights extinguished.

Comment:

Performance Step: 6 IF CNTMT SMP TO CSP VLV(s) can NOT be open, THEN perform the following:

- Consult Plant Staff to determine contingency actions.

Standard: CONSULT Plant Staff to determine contingency actions.

Evaluator's Cue: **Another operator will consult with Plant Staff. The Unit Supervisor directs you to continue with the procedure.**

Comment:

√ **Performance Step: 7** Close RWST TO CSP 1 & 3 AND 2 & 4 SUCT VLVs:

- 1-HS-4758

Standard: INSERT key then TURN 1-HS-4758, RWST TO CSP 1 & 3 to CLOSE and OBSERVE green CLOSE light illuminated.

Comment:

Performance Step: 8 Close RWST TO CSP 1 & 3 AND 2 & 4 SUCT VLVs:

- 1-HS-4759

Standard: INSERT key then TURN 1-HS-4759, RWST TO CSP 2 & 4 to CLOSE and OBSERVE green CLOSE light illuminated.

Comment:

Performance Step: 9 Verify containment spray flows.

Standard: OBSERVE containment spray flows on:

- 1-FI-4772-1 (CSP 1)
- 1-FI-4772-2 (CSP 3)

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM S-5

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: A Large Break LOCA has occurred. EOS-1.3A, Transfer to Cold Leg Recirculation has been performed through Step 3.

INITIATING CUE: The Unit Supervisor has directed you to transfer Containment Spray to the Containment Sumps per EOS-1.3A, Transfer to Cold Leg Recirculation starting at Step 4.

Facility: COMANCHE PEAK Task No.:

Task Title: Control Axial Flux Distribution JPM No.: 2007 NRC JPM S-6

K/A Reference: SF1.001.A2.19 3.6 / 4.0

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: Reactor power is 100% with all controls in automatic. A Xenon oscillation is occurring as indicated by ΔI slightly above target and rising. Reactor Engineering has requested that any rod movement be done in three (3) step increments. Operations Management concurs with these actions, and has no other limitations. The Main Control Board ΔI Chart is not available. The Unit Supervisor directs you to consult the Delta Flux Target Display on the Plant Computer System.

Task Standard: Locate and correctly perform Critical Steps of IPO-003A.

Required Materials: IPO-003A, Power Operations, Section 5.5, Operating at Constant Turbine Load and Attachment 2, ΔI Control / Dampening Xenon Oscillations, Rev.24, PCN-13.

Initiating Cue: The Unit Supervisor directs you to dampen the Xenon oscillation using control rods per IPO-003A, Power Operations, Section 5.5, Operating at Constant Turbine Load and Attachment 2, ΔI Control / Dampening Xenon Oscillations.

Time Critical Task: N/A

Validation Time: 5 minutes

SIMULATOR SETUP

BOOTH OPERATOR:

EXECUTE IC-20 or any 100% power EOL Initial Condition and then PERFORM the following:

- **SET the Main Control Board (MCB) to the Delta Flux Target Display by performing the following:**
  - **On Delta Flux Main Menu, SELECT CAOC Tent Display (Menu Item #6)**
  - **Display on MCB CRT (RD TT06 ENTER then Target ENTER)**
- **ADJUST Computer Display to place ΔI slightly above target.**
- **INSERT Malfunction RP01 to prevent an inadvertent automatic trip.**
- **INSERT Malfunctions RD03D4 and RD03H8 during the second rod insertion to control ΔI.**

EXAMINER:

PROVIDE the examinee with a copy of:

- **IPO-003A, Power Operations, Section 5.5, Operating at Constant Turbine Load.**
- **IPO-003A, Power Operations, Attachment 2, ΔI Control / Dampening Xenon Oscillations.**

(Denote Critical Steps with a check mark)

START TIME: _____

√ **Performance Step: 1** Verify Rod Control system in MANUAL.

Standard: PLACE Control Rod Bank Select Switch, 1/1-RBSS, in the MAN position.

Evaluator's Cue: **If necessary, REMIND the candidate as to move rods in three (3) step increments to control ΔI.**

Comment:

√ **Performance Step: 2** Step in the control rods 3 steps.

Standard: PLACE Control Rod Motion Control Switch 1/1-FLRM to the IN direction and INSERT the Control rods three (3) steps.

- OBSERVE control rods inserting on DRPI Indication and 1-SC-CBD2, Control Bank D Group 2.
- OBSERVE 1/1-RIL Control Rod Motion IN light illuminated.

Evaluator's Cue: **If Tave is decreasing, INFORM the candidate that another operator will control RCS temperature.**

Evaluator's Cue: **When the initial movement is completed, INFORM the candidate that the Unit Supervisor requests an additional three (3) step rod movement to control Δ I.**

Comment:

√ **Performance Step: 3** Step in the rods an additional 3 steps.

Standard: PLACE Control Rod Motion Control Switch 1/1-FLRM to the IN direction and INSERT the Control rods three (3) steps.

- OBSERVE control rods inserting on DRPI Indication (CTRL ROD POSN) and 1-SC-CBD2, Control Bank D Group 2 Step Counter Indication.
- OBSERVE 1/1-RIL Control Rod Motion IN light illuminated.

Booth Operator's Cue: **When the second rod insertion is completed, INSERT Malfunctions RD03D4 and RD03H8.**

Comment:

Performance Step: 4 Recognize two (2) control rods have dropped and that a Reactor Trip is required.

Standard: DETERMINE two (2) control rods have dropped in the core by OBSERVING DRPI Indication (CTRL ROD POSN) and that a Reactor Trip is required.

Evaluator's Note: **The following step represents the Alternate Path of this JPM.**

Comment:

√ **Performance Step: 5** Trip the Reactor.

Standard: PLACE 1/1-RTC, RX TRIP BKR Switch to the TRIP position.

- VERIFY Reactor Trip Breakers OPEN by OBSERVING 1/1-RTBAL and 1/1-RTBBL Reactor Trip green OPEN lights illuminated.
- OBSERVE all Control Rods inserted on DRPI Indication (CTRL ROD POSN).

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM S-6

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: Reactor power is 100% with all controls in automatic. A Xenon oscillation is occurring as indicated by ΔI slightly above target and rising. Reactor Engineering has requested that any rod movement be done in three (3) step increments. Operations Management concurs with these actions, and has no other limitations. The Main Control Board ΔI Chart is not available. The Unit Supervisor directs you to consult the Delta Flux Target Display on the Plant Computer System.

INITIATING CUE: The Unit Supervisor directs you to dampen the Xenon oscillation using control rods per IPO-003A, Power Operations, Section 5.5, Operating at Constant Turbine Load and Attachment 2, ΔI Control / Dampening Xenon Oscillations.

Facility: COMANCHE PEAK Task No.:

Task Title: Isolate Accumulators JPM No.: 2007 NRC JPM S-7

K/A Reference: SF2.006.A4.07 4.4 / 4.4

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: In response to a loss of reactor coolant, EOP-1.0A, Transfer to cold Leg Recirculation has just been completed.

Task Standard: Locate and correctly perform Critical Steps of EOP-1.0A.

Required Materials: EOP-1.0A, Loss of Reactor or Secondary Coolant, Rev. 8

Initiating Cue: The Unit Supervisor directs you to isolate the Accumulators per EOP-1.0A, Loss of Primary or Secondary Coolant, Step 14.

Time Critical Task: N/A

Validation Time: 9 minutes

SIMULATOR SETUP

BOOTH OPERATOR:

EXECUTE IC-65, Post LOCA with RHR swap over complete and then PERFORM the following:

- **INSERT Remote Function DISI8808D set to OPEN position (8808D Accumulator).**
- **VERIFY Remote Function IAR-17, Instrument Air Backup Compressor inserted.**

EXAMINER:

PROVIDE the examinee with a copy of EOP-1.0A, Loss of Primary or Secondary Coolant, Step 14, Check If Accumulators Should Be Isolated.

NOTE: This JPM can be performed in conjunction with NRC JPM S-5, however, ensure that JPM S-5 is performed first or a low level in the RWST will impact JPM S-5.

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Check If Accumulators Should Be Isolated:

- At least two RCS hot leg temperatures - LESS THAN 380ºF.

Standard: OBSERVE any two (2) wire range recorders 1-TR-413A HL 1 WR TEMP, 1-TR-423A HL 2 WR TEMP, 1-TR-433A, HL 3 WR TEMP and 1-TR-443A HL 4 WR TEMP < 380ºF, **or** OBSERVE 1-T1-413A HL 1 TEMP (WR) **and** 1-T1-423A, HL 2 TEMP (WR), both < 380ºF.

Comment:

Performance Step: 2 Check If Accumulators Should Be Isolated:

- Check power to injection valves - AVAILABLE

Standard: OBSERVE 1/1-8808A, ACCUM 1 INJ VLV, 1/1-8808B, ACCUM 2 INJ VLV, 1/1-8808C, ACCUM 3 INJ VLV, 1/1-8808D, and ACCUM 4 INJ VLV red OPEN lights illuminated.

Comment:

√ **Performance Step: 3** Check If Accumulators Should Be Isolated:

- Close all accumulator injection valves

Standard: INSERT key then TURN 1/1-8808A, ACCUM 1 INJ VLV to OFF and OBSERVE green CLOSE light illuminated.

Comment:

√ **Performance Step: 4** Check If Accumulators Should Be Isolated:

- Close all accumulator injection valves

Standard: INSERT key then TURN 1/1-8808B, ACCUM 2 INJ VLV to OFF and OBSERVE green CLOSE light illuminated.

Comment:

√ **Performance Step: 5** Check If Accumulators Should Be Isolated:

- Close all accumulator injection valves

Standard: INSERT key then TURN 1/1-8808C, ACCUM 3 INJ VLV to OFF and OBSERVE green CLOSE light illuminated.

Comment:

√ **Performance Step: 6** Check If Accumulators Should Be Isolated:

- Close all accumulator injection valves

Standard: INSERT key then TURN 1/1-8808D, ACCUM 4 INJ VLV to OFF and OBSERVE red OPEN light remains illuminated and valve will not close.

Evaluator's Note: **The following steps represent the Alternate Path of this JPM.**

Comment:

Performance Step: 7 Vent any unisolated accumulator:

- Ensure air compressor running and establish instrument air to containment.

Standard: PLACE 1-HS-3487, CNTMT INSTR AIR ISOL VLV to OPEN and allow switch to spring return to AUTO then OBSERVE 1-PI-3490, CNTMT INSTR AIR HDR PRESS in green band and red AUTO light illuminated.

Comment:

√ **Performance Step: 8** Vent any unisolated accumulator:

- Close SI/PORV ACCUM N2 ISOL VLV, 1/1-8880.

Standard: VERIFY 1/1-8880, SI/PORV ACCUM N2 ISOL VLV is closed and OBSERVE green CLOSE light illuminated.

Comment:

√ **Performance Step: 9** Vent any unisolated accumulator:

- Open the unisolated accumulator(s) nitrogen vent valve.

Standard: PLACE 1/1-8875B, ACCUM N2 SPLY/VNT VLV in OPEN and OBSERVE red AUTO light illuminated.

Comment:

√ **Performance Step: 10** Vent any unisolated accumulator:

- Open ACCUM 1●4 VENT CTRL, 1-HC-943.

Standard: ROTATE 1-HC-943, ACCUM 1●4 VENT CTRL POT knob in clockwise direction and OBSERVE valve at > 10% OPEN demand.

Comment:

Performance Step: 11 Continue with Step 15. WHEN the accumulator is depressurized, THEN:

- Close 1-HC-943.
- Close the accumulator nitrogen vent valve.
- OPEN 1/1-8880.

Standard: REFER to Step 15 while OBSERVING Accumulator 4 pressure lowering on 1-PI-966 and 1-PI-967.

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM S-7

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: In response to a loss of reactor coolant, EOP-1.0A, Transfer to Cold Leg Recirculation has just been completed.

INITIATING CUE: The Unit Supervisor directs you to isolate the Accumulators per EOP-1.0A, Loss of Primary or Secondary Coolant, Step 14.

Facility: COMANCHE PEAK Task No.:

Task Title: Perform Containment Pressure Reduction JPM No.: 2007 NRC JPM S-8

K/A Reference: SF8.029.A3.01 3.8 / 4.0

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: A Containment pressure reduction is required. All applicable Containment Ventilation System permits have been processed and the Prerequisites of Section 2.6 have been met. The Unit Supervisor has completed all applicable steps associated with the release permit.

Task Standard: Locate and correctly perform Critical Steps of SOP-801A and ALM-0032A.

Required Materials: SOP-801A, Containment Ventilation System, Rev. 12, PCN-4.
ALM-0032A, Alarm Procedure 1-ALB-3B, Rev. 7, PCN-7.

Initiating Cue: The Unit Supervisor directs you to place the Containment Pressure Relief System in operation per SOP-801A, Containment Ventilation System starting at Step 5.6.5.B.

Time Critical Task: N/A

Validation Time: 6 minutes

SIMULATOR SETUP

BOOTH OPERATOR:

EXECUTE IC-14 or any at power Initial Condition and then PERFORM the following:

- **OVERRIDE Containment Pressure Narrow Range indications (1-PI-5470A & 1-PI-5470B) to 0.8 psig on Control Board #3 (CB-03) vertical section.**
- **INSERT Remote Function RMR10 to BLOCK (maintains 1-HV-5548 & 5549 OPEN).**
- **INSERT Malfunction RM03B3, PRM Radiation Monitor Failure 1-RE-5503 / CAG 197 @1E^{6}.**
- **INSERT Override AN3B_4 to place ALB-03B-4.1, CNTMT AIR RAD HI to ON when Malfunction is activated.**
- **ENSURE PC-11 is reset and CAG-197 is green.**

NOTE: ENSURE PC-11 is reset and CAG-197 is green after each JPM performance.

EXAMINER:

PROVIDE the examinee with a copy of:

- **SOP-801A, Containment Ventilation System.**
- **MARK UP procedure (INITIAL and/or N/A) as appropriate up to Step 5.6.5.B.**

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Log the time the containment vent is started.

Standard: RECORD the start time for the containment vent in SOP-801A or the Control Room Log Sheet.

Comment:

√ **Performance Step: 2** Open 1-HS-5574, AIR PRG EXH DMPR.

Standard: POSITION 1-HS-5574, AIR PRG EXH DMPR to OPEN and OBSERVE the red OPEN light illuminated.

Comment:

√ **Performance Step: 3** Open 1-HS-5549, CNTMT PRESS RLF ISOL VLV.

Standard: POSITION 1-HS-5549, CNTMT PRESS RLF ISOL VLV to OPEN and OBSERVE the red OPEN light illuminated.

Comment:

√ **Performance Step: 4** Open 1-HS-5548, CNTMT PRESS RLF ISOL VLV.

Standard: POSITION 1-HS-5548, CNTMT PRESS RLF ISOL VLV to OPEN and OBSERVE the red OPEN light illuminated.

Comment:

Performance Step: 5 Verify containment pressure has been reduced to within the limits specified in Section 4.0 (or to atmospheric pressure, if required for purging).

Standard: DETERMINE containment pressure is lowering by OBSERVING containment pressure indications 1-PI-5470A & 1-PI-5470B on CB-3.

Booth Cue: **EXECUTE Malfunction RM03B3, PRM Radiation Monitor failure.**

Evaluator's Cue: **Acknowledge any alarms.**

Comment:

Performance Step: 6 Recognize Annunciator in alarm.

Standard: ACKNOWLEDGE and RESPOND to Annunciator alarm 1-ALB-3B-4.1, CNTMT AIR RAD HI located at the CB #3 bench boards.

Evaluator's Note: **Due to the ESFAS automatic actions associated with this alarm, the candidate may immediately isolate valves listed in Steps 9 and 10 of this JPM.**

Comment:

Performance Step: 7 Verify the alarm on PC-11.

- CAG-197, GASEOUS.

Standard: At PC-11, DEPRESS F7 then 197 then ENTER and OBSERVE high radiation on 1-RE-5503, CNTMT AIR PIG GAS, CAG-197.

Comment:

Performance Step: 8 Verify Containment Ventilation Isolation has occurred. (1-CB-02)

- 1-MLB-45A, SI/CNTMT VENT ISOL
- 1-MLB-45B, SI/CNTMT VENT ISOL

Standard: DETERMINE Containment Ventilation Isolation has NOT occurred on 1-MLB-45A, SI/CNTMT VENT ISOL or 1-MLB-45B, SI/CNTMT VENT ISOL.

Evaluator's Note: **At this point the candidate can reference either SOP-901A or 1-ALB-03B to perform Containment Ventilation Isolation actions.**

Evaluator's Note: **The following two steps represent the Alternate Path of this JPM.**

Comment:

√ **Performance Step: 9** If Containment Ventilation Isolation is NOT complete, manually align components as necessary.

Standard: POSITION 1-HS-5548, CNTMT PRESS RLF ISOL VLV to CLOSE and OBSERVE the green CLOSE light illuminated.

Comment:

√ **Performance Step: 10** If Containment Ventilation Isolation is NOT complete, manually align components as necessary.

Standard: POSITION 1-HS-5549, CNTMT PRESS RLF ISOL VLV to CLOSE and OBSERVE the green CLOSE light illuminated.

Comment:

Performance Step: 11 Notify Radiation Protection and plant personnel of possible increases in radiation levels for Containment, Safeguard, Auxiliary and Fuel buildings.

Standard: NOTIFY using the Plant Paging System plant personnel of possible increases in radiation levels for Containment, Safeguard, Auxiliary and Fuel buildings.

Comment:

Terminating Cue: **Plant personnel have been notified. This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM S-8

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: A Containment pressure reduction is required. All applicable Containment Ventilation System permits have been processed and the Prerequisites of Section 2.6 have been met. The Unit Supervisor has completed all applicable steps associated with the release permit.

INITIATING CUE: The Unit Supervisor directs you to place the Containment Pressure Relief System in operation per SOP-801A, Containment Ventilation System starting at Step 5.6.5.B.

Facility: COMANCHE PEAK Task No.:

Task Title: Local Dilution Path Isolation JPM No.: 2007 NRC JPM P-1

K/A Reference: SF1.029.EA2.05 3.4 / 3.4

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied. **All Steps for this JPM will be simulated.**

Initial Conditions: The Unit 1 (Unit 2) Control Room crew has entered FRS-0.1A (FRS-0.1B), Response to Nuclear Power Generation/ATWT.

Task Standard: Locate and correctly perform Critical Steps of FRS-0.1A (B).

Required Materials: FRS-0.1A, Response to Nuclear Power Generation/ATWT, Rev. 8
FRS-0.1B, Response to Nuclear Power Generation/ATWT, Rev. 8

Initiating Cue: The Unit Supervisor directs you to locally ensure all Unit 1 (Unit 2) dilution paths are isolated per FRS-0.1A (FRS-0.1B), Response to Nuclear Power Generation/ATWT, Step 11.

Time Critical Task: N/A

Validation Time: 10 minutes

JPM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **FRS-0.1A (FRS-0.1B), Response to Nuclear Power Generation/ATWT, Step 11.**

CIRCLE the Unit on which this JPM is to be performed on the JPM CUE SHEET.

NOTE: This JPM may be performed on either Unit 1 or Unit 2.

(Denote Critical Steps with a check mark)

START TIME: _____

√ **Performance Step: 1** Ensure All Dilution Paths - ISOLATED

- RMUW upstream isolation valve 1(2)CS-8455.

Standard: ROTATE 1(2)CS-8455, REACTOR MAKEUP WATER TO CVCS BA BLNDR 1(2)-01 UPSTRM ISOL VLV handwheel in the CLOCKWISE direction until valve is closed.

Evaluator's Cue: **CS-8455 is closed.**

Evaluator's Note: **Valve is located ~2 feet above floor in the Auxiliary Building 822' Blender Room (SE corner for Unit 1 and NE corner for Unit 2).**

Comment:

√ **Performance Step: 2** Ensure All Dilution Paths - ISOLATED

- Manual emergency boration valve, 1(2)CS-8439-RO.

Standard: OBTAIN reach rod tool then ROTATE 1(2)CS-8439-RO, U1(2) CVCS CHRG PMP EMER BORATE MAN VLV RMT OPER reach rod in the CLOCKWISE direction until valve is closed.

Evaluator's Cue: **CS-8439 is closed.**

Evaluator's Note: **Valve is located on floor (under yellow cover) in the Auxiliary Building 822' Blender Room (center of room for both Units).**

Comment:

Performance Step: 3 Ensure All Dilution Paths - ISOLATED

- BTRS Isolation Valve 1/1(1/2)-7054.

Standard: EXIT the Auxiliary Building 822' Blender Room and INFORM the Examiner that the switch is located in the Control Room.

Evaluator's Cue: **Another operator will verify that the BTRS Isolation Valve is closed.**

Evaluator's Note: **BTRS Isolation Valve 1/1(1/2)-7054 is a valve switch located in the Control Room adjacent to the CVCS controls.**

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM P-1

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: The Unit 1 (Unit 2) Control Room crew has entered FRS-0.1A (FRS-0.1B), Response to Nuclear Power Generation/ATWT.

INITIATING CUE: The Unit Supervisor directs you to locally ensure all Unit 1 (Unit 2) dilution paths are isolated per FRS-0.1A (FRS-0.1B), Response to Nuclear Power Generation/ATWT, Step 11.

Facility: COMANCHE PEAK Task No.:

Task Title: Energize Inverter IV1EC3 (Unit 1) or IV2EC3 (Unit 2) JPM No.: 2007 NRC JPM P-2

K/A Reference: SF6.062.A3.04 2.7 / 2.9

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied. **All Steps for this JPM will be simulated.**

Initial Conditions: Unit 1 (Unit 2) Inverter IV1EC3 (IV2EC3) in being returned to service.

Task Standard: Locate and correctly perform Critical Steps of SOP-607A(B).

Required Materials: SOP-607A, 118 VAC Distribution System and Inverters, Rev. 22, PCN-2.
SOP 607B, 118 VAC Distribution System and Inverters, Rev. 15, PCN-2.

Initiating Cue: The Unit Supervisor has directed you to place the Unit 1 (Unit 2) Inverter IV1EC3 (IV2EC3) in service per SOP-607A (SOP-607B), 118 VAC Distribution System and Inverters, starting at Step 5.3.1.F.

Time Critical Task: N/A

Validation Time: 6 minutes

JPM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **SOP-607A (SOP-607B), 118 VAC Distribution System and Inverters.**
- **MARK UP procedure (INITIAL and/or N/A) as appropriate up to Step 5.3.1.F.**

CIRCLE the Unit on which this JPM is to be performed on the JPM CUE SHEET.

NOTE: This JPM may be performed on either Unit 1 or Unit 2.

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Ensure the following breakers and transfer switches are in the position indicated:

- TRS2-IV1EC3 (TRS2-IV2EC3), XFER SW S2 is in NORMAL SOURCE AND key inserted in lock with lock extended.

Standard: VERIFY TRS2-IV1EC3 (TRS2-IV2EC3), XFER SW S2 in NORMAL SOURCE and key inserted in lock with lock extended.

Evaluator's Cue: **Transfer Switch S2 is in NORMAL SOURCE with key inserted and lock extended.**

Comment:

Performance Step: 2 Ensure the following breakers and transfer switches are in the position indicated:

- TRS1-IV1EC3 (TRS1-IV2EC3), BYP SW S1 is in BYPASS SOURCE.

Standard: VERIFY TRS1-IV1EC3 (TRS1-IV2EC3), BYP SW S1 in BYPASS SOURCE.

Evaluator's Cue: **Bypass Switch S1 is in BYPASS SOURCE.**

Comment:

Performance Step: 3 Ensure the following breakers and transfer switches are in the position indicated:

- IV1EC3/CB1/BKR (IV2EC3/CB1/BKR), DC INPUT is OFF AND key inserted in lock.

Standard: VERIFY IV1EC3/CB1/BKR (IV2EC3/CB1/BKR), DC INPUT in OFF with key inserted in lock.

Evaluator's Cue: **DC INPUT is OFF and key is inserted in lock.**

Comment:

Performance Step: 4 Ensure the following breakers and transfer switches are in the position indicated:

- IV1EC3/CB2/BKR (IV2EC3/CB2/BKR), AC OUTPUT is OFF.

Standard: VERIFY IV1EC3/CB2/BKR (IV2EC3/CB2/BKR), AC OUTPUT is OFF.

Evaluator's Cue: **AC OUTPUT is OFF.**

Comment:

Performance Step: 5 Ensure the following breakers and transfer switches are in the position indicated:

- IV1EC3/CB4/BKR (IV2EC3/CB4/BKR), BYP SOURCE is OFF.

Standard: VERIFY IV1EC3/CB4/BKR (IV2EC3/CB4/BKR), BYP SOURCE is OFF.

Evaluator's Cue: **BYPASS SOURCE is OFF.**

Comment:

Performance Step: 6 IF Distribution Panel 1EC5 (2EC5) is deenergized, THEN ensure ALL load breakers on 1EC5 (2EC5) [CP1-ECDPEC-11 (CP2-ECDPEC-11)] are OFF.

Standard: DETERMINE if Distribution Panel 1EC5 (2EC5) is deenergized, then VERIFY all load breakers on Distribution Panel 1EC5 (2EC5) are OFF.

Evaluator's Note: **Panel 1EC5 (2EC5) is located in a different area and will not be accessed during this JPM.**

Evaluator's Cue: **Distribution Panel 1EC5 (2EC5) is deenergized and all load breakers on Distribution Panel 1EC5 (2EC5) are OFF.**

Comment:

√ **Performance Step: 7** Press PRECHARGE pushbutton until yellow PRECHARGE light is lit.

Standard: DEPRESS silver PRECHARGE pushbutton until yellow PRECHARGE light is illuminated.

Evaluator's Cue: **PRECHARGE light is illuminated.**

Comment:

√ **Performance Step: 8** While the Precharge light is lit, Turn ON IV1EC3/CB1/BKR (IV2EC3/CB1/BKR), DC INPUT.

Standard: PLACE IV1EC3/CB1/BKR (IV2EC3/CB1/BKR), DC INPUT switch to ON.

Evaluator's Cue: **DC INPUT is turned ON.**

Comment:

Performance Step: 9 Verify Inverter AC OUTPUT voltage is 118 to 128 VAC.

Standard: VERIFY Inverter AC OUTPUT voltage is 118 to 128 VAC.

Evaluator's Cue: **AC OUTPUT voltage is 125 VAC.**

Comment:

√ **Performance Step: 10** Turn ON IV1EC3/CB2/BKR (IV2EC3/CB2/BKR), AC OUTPUT.

Standard: PLACE IV1EC3/CB2/BKR (IV2EC3/CB2/BKR), AC OUTPUT breaker to ON.

Evaluator's Cue: **AC OUTPUT breaker is ON.**

Comment:

√ **Performance Step: 11** Turn ON IV1EC3/CB4/BKR (IV2EC3/CB4/BKR), BYP SOURCE.

Standard: PLACE IV1EC3/CB4/BKR (IV2EC3/CB4/BKR), BYP SOURCE switch to ON.

Evaluator's Cue: **BYPASS SOURCE is ON.**

Comment:

Performance Step: 12 Verify IN SYNC light is LIT.

Standard: VERIFY yellow IN SYNC light is illuminated.

Evaluator's Cue: **IN SYNC light is illuminated.**

Comment:

√ **Performance Step: 13** Depress BYPASS SOURCE TO LOAD pushbutton (Static Transfer Switch) and verify BYPASS SOURCE SUPPLYING LOAD RED light is LIT.

Standard: DEPRESS BYPASS SOURCE TO LOAD pushbutton (Static Transfer Switch) and VERIFY BYPASS SOURCE SUPPLYING LOAD RED light is illuminated.

Evaluator's Cue: **BYPASS SOURCE SUPPLYING LOAD red light is illuminated.**

Comment:

√ **Performance Step: 14** Place TRS1-IV1EC3 (TRS1-IV2EC3), BYP SW S1 in NORMAL SOURCE.

Standard: PLACE TRS1-IV1EC3 (TRS1-IV2EC3), BYP SW S1 in NORMAL SOURCE.

Evaluator's Cue: **BYPASS SWITCH S1 is in NORMAL SOURCE position.**

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM P-2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: Unit 1 (Unit 2) Inverter IV1EC3 (IV2EC3) in being returned to service.

INITIATING CUE: The Unit Supervisor has directed you to place the Unit 1 (Unit 2) Inverter IV1EC3 (IV2EC3) in service per SOP-607A (SOP-607B), 118 VAC Distribution System and Inverters, starting at Step 5.3.1.F.

Facility: COMANCHE PEAK Task No.:

Task Title: Control Transfer of Steam Generator Atmospheric Relief Valves JPM No.: 2007 NRC JPM P-3

K/A Reference: SF4-S.068.AA1.01 4.3 / 4.5

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied. **All Steps for this JPM will be simulated.**

Initial Conditions: The Control Room has been evacuated due to a toxic gas. The operators at the Remote Shutdown Panel require manual control of the Steam Generator Atmospheric Relief Valves. An operator has been dispatched to transfer connections in Unit 1 (Unit 2) Junction Box JB1S-1053O (JB2S-1053O).

Task Standard: Locate and correctly perform Critical Steps of ABN-905A(B).

Required Materials: ABN-905A, Loss of Control Room Habitability, Rev. 8, PCN-8.
ABN-905B, Loss of Control Room Habitability, Rev. 3, PCN-7.

Initiating Cue: The Unit Supervisor directs you to perform ABN-905A (ABN-905B), Loss of Control Room Habitability, Attachment 9, Control Transfer of Steam Generator Atmospheric Relief Valves. Transfer connections in Unit 1 (Unit 2) Junction Box JB1S-1051G (JB2S-1051G).

Time Critical Task: N/A

Validation Time: 10 minutes

JPM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-905A (ABN-905B), Loss of Control Room Habitability, Attachment 9, Control Transfer of Steam Generator Atmospheric Relief Valves.**

CIRCLE the Unit on which this JPM is to be performed on the JPM CUE SHEET.

NOTE: This JPM may be performed on either Unit 1 or Unit 2.

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Locate appropriate junction boxes JB1S-1051G (JB2S-1051G) and JB1S-1276 (JB2S-1276).

Standard: TRANSIT to SFGD 852', SG High Pressure Feed Area and LOCATE junction boxes JB1S-1051G (JB2S-1051G) and JB1S-1276 (JB2S-1276) on the wall.

Evaluator's Note: **Junction boxes should be opened to allow candidate to describe their actions.**

Comment:

√ **Performance Step: 2** Open appropriate junction boxes JB1S-1051G (JB2S-1051G) and JB1S-1276 (JB2S-1276).

Standard: PERFORM the following:

- Using crescent wrench or similar tool, LOOSEN junction box cover hold down tabs.
- OPEN JB1S-1051G (JB2S-1051G) and JB1S-1276 (JB2S-1276).

Evaluator's Cue: **The junction box covers are open.**

Evaluator's Note: **Junction box JB1S-1051G (JB2S-1051G) is located above JB1S-1276 (JB2S-1276).**

Comment:

√ **Performance Step: 3** Place disconnect switches in OFF.

Standard: PLACE both disconnect switches inside JB1S-1051G (JB2S-1051G) in the OFF position.

Evaluator's Cue: **The disconnect switches are in OFF.**

Evaluator's Note: **The disconnect switches are toggled between ON and OFF. There is no other labeling.**

Comment:

√ **Performance Step: 4** Route cable through conduit from junction box listed under CONNECTOR to junction box listed under SWITCHES.

Standard: ROUTE connector cable from the lower junction box [JB1S-1276 (JB2S-1276)] through conduit to the upper junction box [JB1S-1051G (JB2S-1051G)].

Evaluator's Cue: **The cable is routed to the upper junction box.**

Comment:

√ **Performance Step: 5** Connect prefabricated connector.

Standard: ALIGN the male and female ends of the connector and SECURE.

Evaluator's Cue: **The cable is connected.**

Comment:

Performance Step: 6 Close junction boxes.

Standard: PERFORM the following:

- CLOSE the junction box doors JB1S-1051G (JB2S-1051G) and JB1S-1276 (JB2S-1276).
- SLIDE the junction box cover hold down tabs.
- TIGHTEN using crescent wrench or similar tool.

Comment:

Terminating Cue: **This JPM is complete.**

STOP TIME: _____ **CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM P-3

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: The Control Room has been evacuated due to a toxic gas. The operators at the Remote Shutdown Panel require manual control of the Steam Generator Atmospheric Relief Valves. An operator has been dispatched to transfer connections in Unit 1 (Unit 2) Junction Box JB1S-1053O (JB2S-1053O).

INITIATING CUE: The Unit Supervisor directs you to perform ABN-905A (ABN-905B), Loss of Control Room Habitability, Attachment 9, Control Transfer of Steam Generator Atmospheric Relief Valves. Transfer connections in Unit 1 (Unit 2) Junction Box JB1S-1051G (JB2S-1051G).

Facility:	CPSES	Scenario No.:	1	Op Test No.:	NRC
Examiners:		Operators:			

Initial Conditions:
- 100% power - RCS Boron is 906 ppm by Chemistry Sample.
- Power Operated Relief Valve (PCV-456) closed and isolated due to seat leakage.

Turnover:
- Power reduction required at 25%/hr (MWe/min).

Critical Tasks:
- Determines Steam Generator #4 is ruptured and isolates the Steam Generator.
- Determines Safety Injection Pump fails to start and starts pump.
- Determines SGTR and SBLOCA and performs actions to minimize leak flow.

Event No.	Malf. No.	Event Type*	Event Description
1 + 20 min		R (RO) N (BOP, SRO)	Power reduction required at 25% per hour.
2 +30 min	RD08	I (RO, SRO)	Automatic Rod Control direction failure.
3 +40 min	SW01B	C (BOP, SRO) TS (SRO)	Station Service Water Pump (1-02) trip.
4 +50 min	RX08A	I (RO, SRO) TS (SRO)	Pressurizer Pressure Channel (PT-455) fails high.
5 +60 min	SG01D	M (ALL)	Steam Generator #4 Tube Rupture @ 350 gpm (120 second ramp).
6 +60 min	ED03B	M (ALL)	Loss of 345 kV Transformer 1ST (Loss of all RCPs).
7 +60 min	SI04C	C (BOP)	Train A Safety Injection Pump (1-01) fails to start from sequencer.
8 +100 min	RX16A	M (ALL)	Power Operated Relief Valve (PCV-455A) fails open during depressurization (SBLOCA).

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

SCENARIO SUMMARY NRC #1

The crew will conduct a down power pre-shift brief prior to assuming the watch. Once completed, the crew will assume the shift and commence a power reduction at 25% per hour for Main Turbine Valve Testing per Integrated Plant Operating (IPO) procedure IPO-003A, Power Operations, Attachment 6, OPT-217A Power Reduction.

Once the down power is underway, an automatic Rod Control direction failure will occur. The crew will enter Abnormal Conditions Procedure (ABN) ABN-712, Rod Control System Malfunction. The crew will secure the power reduction and perform actions to restore plant parameters to normal.

When control of the plant is restored, a Station Service Water Pump will trip. The crew will follow guidance contained in ABN-501, Station Service Water System Malfunction to restore Service Water flow. The SRO will evaluate Technical Specifications.

After the crew has stabilized the plant, a Pressurizer pressure instrument fails high and the crew responds per ABN-705, Pressurizer Pressure Malfunction. The SRO will evaluate Technical Specifications.

When the plant is stable, a Steam Generator Tube Rupture on Loop 4 (SGTR) will occur. Upon Reactor trip, a loss of 345 kV Transformer will occur removing power to the Reactor Coolant Pumps and all Non-1E Buses. The crew will enter EOP-0.0A, Reactor Trip or Safety Injection and then transition to EOP-3.0A, SGTR to isolate the affected Steam Generator.

Following the Reactor Trip the Train A Safety Injection Pump 1-01 fails to start. The pump is subsequently started during performance of EOP-0.0A, Attachment 2.

During the RCS depressurization, a Power Operated Relief Valve (PCV-455A) will fail open with its associated Block Valve failing to close and require entry into ECA-3.1A, SGTR with Loss of Reactor Coolant - Subcooled Recovery Desired.

Event termination will occur when a RCS cooldown is in progress per ECA-3.1A.

Risk Significance:

- Risk important components out of service: PORV isolated due to seat leakage
- Failure of risk important system prior to trip: Station Service Water Pump trip
- Risk significant core damage sequence: SGTR with SBLOCA
- Risk significant operator actions: Failure to isolate ruptured SG
Failure to start SI Pump

CPSES
2007 Facility NRC Initial License Examination
Simulator Scenario Setup
Scenario 1

BOOTH OPERATOR'S INSTRUCTIONS

SETUP

IC: Use IC #18 and see attached Event File for NRC Scenario #1.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
1		SI04C	Train A Safety Injection Pump 1-01 start failure		K0
		DIRCV8000A	PORV Block Valve 1-8000A Overridden to Auto		K4
		DIRCV8000B	PORV Block Valve 1-8000B Overridden to Auto		K4
		N/A	Power reduction at 25%/hour (5 MWe/min)		K0
2		RD08	Automatic Rod Control direction failure		K1
3		SW01B	Service Water Pump (1-02) trip		K2
4		RX08A	Pressurizer Pressure Channel (PT-455) fails high		K3
5		SG01D	Steam Generator #4 Tube Rupture	350 gpm	K4 (120 sec. ramp)
6		ED03B	Loss of 345 kV Transformer 1ST; See **NOTE 1**		K5 Reactor Trip
NOTE 1: Keyed to RX trip when TG output breakers open					
7		RX16A	PORV (PCV-455A) fails open; See **NOTE 2**		K6
NOTE 2: When PORV is opened for depressurization INSERT K6					

Op Test No.:	NRC	Scenario #	1	Event #	1	Page	4	of	24
Event Description:	Power Reduction at 25% per hour for Valve Testing								

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**ALIGN Control Board switches before loading scenario.** **EXECUTE IC #18 and NRC Scenario #1 SETUP file.** **ENSURE all Simulator Annunciator Alarms are ACTIVE.** **ENSURE Control Board Tags are hung:** **- Yellow Tag PRZR PORV PCV-456.** **- Yellow Tag and CLOSE PRZR Block Valve 1-8000B.** **ENSURE Operator Aid Tags (RCS & PRZR Cb) reflect current plant conditions.** **ENSURE Control Rods are in AUTO.** **ENSURE Turbine Load Rate set at 10 MW / minute.** **ENSURE RAPTOR printout provided with Turnover.** **ENSURE Computer next to Turbine DCS is booted.** **ENSURE procedures in progress are on the RO desk:** **- Copy of IPO-003A, Power Operations, Attachment 6, OPT-217A Power Reduction.** **- Copy of IPO SOP-104A, Reactor Makeup and Chemical Control System.**
Control Room Annunciators in Alarm at 100%:		
PCIP-1.1 – SR TRN A RX TRIP BLK **PCIP-1.2 – IR TRN A RX TRIP BLK** **PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9** **PCIP-1.6 – RX ≥ 10% PWR P-10** **PCIP-2.1 – SR TRN B RX TRIP BLK** **PCIP-2.2 – IR TRN B RX TRIP BLK** **PCIP-2.5 – SR RX TRIP BLK PERM P-6** **PCIP-3.2 – PR TRN A LO SETPT RX TRIP BLK** **PCIP-4.2 – PR TRN B LO SETPT RX TRIP BLK**		
Booth Operator:		**When directed, PLACE simulator in RUN to support Shift Turnover.**
+ 1 min	US	DIRECT performance of IPO-003A, Power Operations, Attachment 6, OPT-217A Power Reduction.
	US	NOTIFY Chemistry and QSE Generation Controller prior to reducing load.

Op Test No.:	NRC	Scenario #	1	Event #	1	Page	5	of	24
Event Description:	Power Reduction at 25% per hour for Valve Testing								

Time	Position	Applicant's Actions or Behavior
	RO	PERFORM the following to COMMENCE RCS boration:
		• ENSURE 1/1-MU, RCS Makeup Manual Actuation is in STOP.
		• PLACE 43/1-MU, RCS Makeup Mode Select in BORATE.
		• SET 1-FK-110, BA Blender Flow Control to desired flowrate (~2 to 7 gpm).
		• SET 1-FY-110B, BA Batch Flow counter for the desired number of gallons (~425 gallons <u>or</u> ~200 gallons + rods for downpower to ~75%).
		• ENSURE 1/1-FCV-110A, Boric Acid Blender Flow Control Valve is in AUTO.
		• START boration by placing 1/1-MU, RCS Makeup Manual Actuation in START.
		• VERIFY 1/1-APBA1, Boric Acid Transfer Pump starts.
		• VERIFY 1/1-FCV-110A, Boric Acid Blender Flow Control Valve throttles to the preset flow rate.
		• VERIFY 1/1-FCV-110B, RCS Makeup to Charging Pump Suction Isolation Valve OPEN.
		• VERIFY 1-FR-110, Boric Acid Flow to Blender RED pen operating properly.
		• VERIFY 1-FY-110B, Batch Flow counter operating properly.
		• When desired amount of boric acid is added, PLACE 1/1-MU, RCS Makeup Manual Actuation in STOP.
		• FLUSH the blender with approximately 50 gallons makeup water when boration is complete.
	BOP	PERFORM the following to LOWER Turbine Load:
		• CHANGE Turbine Load Rate to 5 MWe/min.
		• OPEN "Load Target" OSD.
		• SELECT blue bar and ENTER desired load.
		• DEPRESS "Select" then VERIFY value in blue bar is desired "Load Target" (magnitude and direction).

Op Test No.:	NRC	Scenario #	1	Event #	1	Page	6	of 24
Event Description:	Power Reduction at 25% per hour for Valve Testing							

Time	Position	Applicant's Actions or Behavior
		• DEPRESS "Execute" then VERIFY "Load Target" changes to desired load.
		• CLOSE "Load Target" OSD.
	BOP	As required, PERFORM the following to ADJUST Main Generator MVARs:
		• OPEN "Gen Voltage Target" OSD.
		• DEPRESS "Raise" or "Lower" blue arrow.
		• DEPRESS "Execute" then VERIFY "Gen Voltage Target" changes to desired value.
		• When the desired value is reached, DEPRESS "Stop."
		• CLOSE "Gen Voltage Target" OSD.
+20 min	RO	As required, CONTROL Axial Flux Distribution per Attachment 2 of IPO-003A.
When power is reduced 3% to 5%, or at Lead Evaluator's discretion, PROCEED to Event 2.		

Op Test No.:	NRC	Scenario #	1	Event #	2	Page	7	of	24
Event Description:	Automatic Rod Control Direction Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE RD08, Auto Rod Control Direction failure.**
Indications available: **Following alarms dependent on rate of power reduction:** **6D-1.10 – AVE T_{AVE} T_{REF} DEV** **6D-2.10 – AVE T_{AVE} HI** **6D-4.14 – CONTROL ROD BANK D FULL WTHDRWL TAVE HI**		
+ 1 min	RO	RESPOND to Annunciator Alarms.
	RO	RECOGNIZE control rods stepping in opposite direction of demanded signal.
	US	DIRECT implementation of ABN-712, Rod Control System Malfunction, Section 2.0.
	RO	PLACE 1/1-RBSS Control Rod Bank Select Switch in MANUAL.
	US/RO	DETERMINE Reactor should NOT be tripped.
	US	REVIEW Tech Specs for required one (1) hour actions.
	RO	STOP the boration in progress.
	BOP	STOP the Turbine Load decrease.
	RO/BOP	VERIFY Control Room Instrumentation normal.
		• T_{ave}, NIS power range, Turbine Impulse pressure, N-16, and RCS Loop T_{cold}.
	RO/BOP	VERIFY Rod Control Cooling normal.

Op Test No.:	NRC	Scenario #	1	Event #	2	Page	8	of 24
Event Description:	Automatic Rod Control Direction Failure							

Time	Position	Applicant's Actions or Behavior
		• OBSERVE 1-ALB-11B-1.12, ROD CTRL CAB TEMP HI alarm (DARK).
		• OBSERVE 1-ALB-6D-1.6, CONTRL ROD CTRL URGENT FAIL alarm (DARK).
	US/RO	VERIFY affected rods trippable and within ±12 steps of Group Demand Counter
	RO	VERIFY Rod Position Indicators match actual rod position.
		• DRPI, Step Counters, P/A Converter, Bank Overlap Unit, and Plant Computer.
+ 10 min	US	INITIATE repair as required.
When the control rod actions are addressed, or at Lead Evaluator's discretion, PROCEED to Event 3.		

Op Test No.:	NRC	Scenario #	1	Event #	3	Page	9	of	24
Event Description:	Service Water Pump Trip								

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE SW01B, Service Water Pump 1-02 trip.**
Indications available: **01-1.8 – SSWP 1/2 OVRLOAD / TRIP** **01-2.11 – CCP 2 L/O CLR SSW RTN FLO LO** **01-2.12 – SIP 2 L/O CLR SSW RTN FLO LO** **01-4.8 – CSP 2 & 4 BRG CLR SSW RTN FLO LO**		
+ 1 min	BOP	RESPOND to Annunciator Alarms.
	BOP	RECOGNIZE 1-HS-4251A, Service Water Pump 1-02 amber MISMATCH and white TRIP lights illuminated.
NOTE:		**The next step is an Initial Operator Action.**
	BOP	PLACE 1-DG2E, DG2 Emergency Stop / Start Switch in PULL OUT.
	US	DIRECT implementation of ABN-501, Station Service Water System Malfunction, Section 2.0.
	BOP	VERIFY Train A SSW Pump running.
	BOP	VERIFY Train A CCW Pump running.
B. O. Cue:		**When asked about status of SSW Pump, REPORT as Safeguards Building watch that the SSWP 1-02 50/51 overcurrent relays on Phases B & C are tripped. Perimeter pump is not running and nothing is obviously wrong with SSWP 1-02.**
	RO/BOP	VERIFY equipment on Train B not required for operation:

Op Test No.: NRC	Scenario # 1	Event # 3	Page 10 of 24
Event Description:	Service Water Pump Trip		

Time	Position	Applicant's Actions or Behavior
		• Centrifugal Charging Pump 2 • Diesel Generator 2 • Component Cooling Water Pump 2 • Safety Injection Pump 2 • Containment Spray Pumps 2 & 4
	RO/BOP	PLACE equipment on Train B in PULL OUT.
		• Centrifugal Charging Pump 2 • Station Service Water Pump 2 • Safety Injection Pump 2 • Containment Spray Pumps 2 & 4
	BOP	CHECK status of Component Cooling Water Pump and Heat Exchangers on Train B.
+ 10 min	US	EVALUATE Technical Specifications.
		• LCO 3.7.8.B, Station Service Water System is applicable (72 hour ACTION).
		• With one SSWS Train *inoperable*, restore Train to OPERABLE status.
		• LCO 3.8.1.B, AC Sources - Operating is applicable (1, 4 and 24 hour ACTIONs).
		• With one DG *inoperable*, perform SR 3.8.1.1 for the required offsite circuits (1 hour).
		• With one DG *inoperable*, declare required feature(s) supported by the *inoperable* DG *inoperable* when its required redundant feature is *inoperable* (4 hours).
		• With one DG *inoperable*, perform SR 3.8.1.2 for OPERABLE DG (24 hours).

Op Test No.:	NRC	Scenario #	1	Event #	3	Page	11	of	24
Event Description:	Service Water Pump Trip								

Time	Position	Applicant's Actions or Behavior
<u>Booth Operator:</u>		**If contacted, INFORM the Unit Supervisor that another operator will perform required Tech Spec Surveillance.**
When the Technical Specification actions are addressed, or at Lead Evaluator's discretion, PROCEED to Event 4.		

Op Test No.:	NRC	Scenario #	1	Event #	4	Page	12	of	24
Event Description:	Pressurizer Pressure Channel Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE RX08A, Pressurizer Pressure Channel (PT-455) fails high (100%).**
Indications available: **5B-1.6 – PRZR LO PRESS PORV 456 BLK** **5B-2.6 – PRZR LO PRESS PORV 455A BLK** **5B-3.1 – PRZR PORV OUT TEMP HI** **5B-4.1 – PRZR ANY SFTY RLF VLV OUT TEMP HI** **5C-3.1 – PRZR 1 OF 4 PRESS HI** **5C-4.3 – PRZR PRESS DEV HI**		
+1 min	RO	RESPOND to Annunciator Alarms.
	RO	RECOGNIZE PZR pressure decreasing with heaters OFF and PZR Spray Valves OPEN.
NOTE:		**The next four (4) steps are Initial Operator Actions.**
	RO	ENSURE PCV-455A, PORV and 8000A, PORV Block Valve closed.
	RO	PLACE 1-PK-455A, PRZR Master Pressure Control in MANUAL.
	RO	ADJUST 1-PK-455A for current RCS pressure.
	RO	TRANSFER to an alternate controlling channel, 1/1-PS-455F, PRZR Press Control Channel Select.
	US	DIRECT implementation of ABN-705, Pressurizer Pressure Malfunction, Section 2.0.
	RO	PLACE 1-PK-455A in AUTO.

Op Test No.: NRC	Scenario # 1	Event # 4	Page 13 of 24
Event Description:	Pressurizer Pressure Channel Failure		

Time	Position	Applicant's Actions or Behavior
B. O. Cue:	**If asked, REPORT as Field Support Supervisor that 459F and 455F are indicating normal.**	
	RO	VERIFY automatic control restoring pressurizer pressure to 2235 psig.
	RO	ENSURE a valid channel selected to recorder 1/1-PS-455G, 1-PR-455 PRZR Pressure Select.
	RO	RESTORE PORV to AUTO and Block Valve to OPEN.
	US	Within 1 hour, VERIFY PCIP window 2.6, PRZR PRESS SI BLK PERM P-11 in required state for current pressure (DARK).
		• LCO 3.3.2.L, ESFAS Instrumentation is applicable (1 hour ACTION).
		• Table 3.3.2-1, Item 8b: With one or more required channel(s) *inoperable*, verify interlock is in required state for existing unit condition.
	RO	SELECT Loop 1 on 1-TS-412T, Tave CHAN DEFEAT.
	RO	SELECT Loop 1 on 1/1-JS-411E, N16 PWR CHAN DEFEAT.
	RO	SELECT unaffected channel on 1/1-TS-411E, 1-TR-411 CHAN SELECT.
+10 min	US	EVALUATE Technical Specifications.
		• LCO 3.3.1.E and 3.3.1.M, Reactor Trip System Instrumentation is applicable (72 hour ACTION).
		• With one channel *inoperable*, place channel in trip.
		• LCO 3.3.2.D, ESFAS Instrumentation is applicable (72 hour ACTION).
		• With one channel *inoperable*, place channel in trip.

Op Test No.:	NRC	Scenario #	1	Event #	4	Page	14	of	24

Event Description: Pressurizer Pressure Channel Failure

Time	Position	Applicant's Actions or Behavior
When the Technical Specification actions are addressed, or at Lead Evaluator's discretion, PROCEED to Events 5, 6, 7, and 8.		

Op Test No.:	NRC	Scenario #	1	Event #	5, 6, 7 and 8	Page	15	of	24

Event Description: Steam Generator Tube Rupture/Loss of Transformer 1ST/ PORV Failure/Train A SI Pump Failure

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE SG01D, Steam Generator #4 Tube Rupture, ED03B, Loss of Transformer 1ST, RX16A, PORV PCV-455A fails open.**
Indications available: **5C-1.2 – PRZR LVL DEV LO** **5C-3.3 – PRZR PRESS LO BACKUP HTRS ON** **6A-3.4 – CHRG FLO HI / LO** **PC-11 Radiation monitor alarms on Main Steam line #4**		
+1 min	RO/BOP	RECOGNIZE main steam line radiation monitors in alarm.
	RO/BOP	RECOGNIZE PZR pressure decreasing with steam / feed mismatch.
	US	DIRECT a manual Reactor Trip, Turbine Trip and Safety Injection.
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
	RO	VERIFY Reactor Trip:
		• Reactor trip breakers – OPEN
		• Neutron flux - LOWERING
	RO	VERIFY ALL control rod position rod bottom lights – ON.
		• VERIFY all rods inserted prior to loss of DRPI, otherwise, INITIATE Emergency Boration per the Foldout Page.
	BOP	VERIFY Turbine Trip:
		• All HP turbine stop valves – CLOSED

Op Test No.:	NRC	Scenario #	1	Event #	5, 6, 7 and 8	Page	16	of 24
Event Description:	Steam Generator Tube Rupture/Loss of Transformer 1ST/ PORV Failure/Train A SI Pump Failure							

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY Power to AC Safeguards Busses:
		• AC safeguards busses – BOTH ENERGIZED
	RO	DETERMINE both Trains of SI actuated.
NOTE:	**EOP-0.0A, Attachment 2 steps performed by the BOP are identified later in the scenario.**	
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2.
	RO	VERIFY AFW Alignment:
		• MDAFW Pumps – RUNNING
		• CONTROL AFW total flow as follows:
		• CONTROL AFW total flow as necessary to maintain a Narrow Range level > 10% in any SG or AFW total flow > 460 gpm per Foldout Page.
		• STOP AFW flow to any ruptured SG when NR level is > 10% per Foldout Page.
		• If not required, SECURE TDAFWP per Foldout Page.
		• MAINTAIN proper AFW valve alignment.
	RO	VERIFY Containment Spray Not Required:
		• DETERMINE Containment pressure remained < 18.0 PSIG
		• VERIFY containment spray HX outlet valves – CLOSED
		• VERIFY containment spray pumps – RUNNING
	RO	DETERMINE Main Steam lines should NOT be Isolated:
		• VERIFY Containment pressure < 6.0 PSIG
		• VERIFY Steam line pressure > 610 PSIG

Op Test No.:	NRC	Scenario #	1	Event #	5, 6, 7 and 8	Page	17	of	24

Event Description: Steam Generator Tube Rupture/Loss of Transformer 1ST/ PORV Failure/Train A SI Pump Failure

Time	Position	Applicant's Actions or Behavior
	RO	CHECK RCS Temperature -
		• RCS average temperature stable at or trending to 557°F.
		• ADJUST AFW flow as required.
	RO	CHECK PRZR Valve Status:
		• PRZR Safeties – CLOSED
		• NORMAL PRZR spray valves – CLOSED.
		• PORVs - CLOSED
		• Power to at least one block valve – AVAILABLE
		• Block valves – AT LEAST ONE OPEN
	RO	DETERMINE RCPs NOT RUNNING due to loss of Transformer 1ST.
	US/RO	CHECK if Any SG Is Faulted:
		• DETERMINE pressure in all SGs – NORMAL
	US/RO	CHECK if SG Tubes are Not Ruptured:
		• DETERMINE SG #4 is ruptured and TRANSITIONS to EOP-3.0A, Steam Generator Tube Rupture, Step 1.
NOTE:	**These steps are performed by the BOP as required per EOP-0.0A, Attachment 2. EOP-3.0A steps are identified later in the scenario.**	
	BOP	VERIFY Station Service Water Alignment:
		• VERIFY SSW Pump – RUNNING
		• VERIFY diesel generator cooler SSW return flow

Op Test No.:	NRC	Scenario #	1	Event #	5, 6, 7 and 8	Page	18	of 24
Event Description:	Steam Generator Tube Rupture/Loss of Transformer 1ST/ PORV Failure/Train A SI Pump Failure							

Time	Position	Applicant's Actions or Behavior
CRITICAL TASK	BOP	DETERMINE Train A Safety Injection Pump 1-01 NOT running and STARTS SI Pump 1-01.
	BOP	VERIFY Containment Isolation Phase A.
	BOP	VERIFY Containment Ventilation Isolation.
	BOP	VERIFY CCW Pumps – RUNNING.
	BOP	VERIFY RHR Pumps – RUNNING.
	BOP	VERIFY Proper CVCS Alignment:
		• VERIFY CCPs – RUNNING
		• VERIFY Letdown Relief Valve isolation:
		• Letdown orifice isolation valves – CLOSED
		• Letdown isolation valves - CLOSED
		• 1/1-LCV-459 and 1/1-LCV-460
	BOP	VERIFY ECCS flow:
		• VERIFY CCP SI flow indicator.
		• VERIFY RCS pressure < 1800 PSIG.
		• VERIFY SIP discharge flow indicators.
		• VERIFY RCS pressure > 325 PSIG.
	BOP	VERIFY Feedwater Isolation Complete:
		• VERIFY feedwater isolation valves CLOSED.
		• VERIFY feedwater isolation bypass valves CLOSED.
		• VERIFY feedwater preheater bypass valves CLOSED.
		• VERIFY feedwater bypass control valves CLOSED.

Op Test No.:	NRC	Scenario #	1	Event #	5, 6, 7 and 8	Page	19	of 24
Event Description:	Steam Generator Tube Rupture/Loss of Transformer 1ST/ PORV Failure/Train A SI Pump Failure							

Time	Position	Applicant's Actions or Behavior
		• VERIFY feedwater control valves CLOSED.
		• VERIFY feedwater split flow bypass valves CLOSED.
	BOP	VERIFY Train A Diesel Generator – RUNNING.
	BOP	VERIFY Monitor Lights For SI Load Shedding illuminated.
	BOP	VERIFY Proper SI alignment per MLB light indication.
	BOP	VERIFY Safety Injection components alignment per Table 1.
NOTE:	**EOP-3.0A, Steam Generator Tube Rupture steps begin here.**	
+20 min	US/RO	DETERMINE RCPs are stopped.
	US/RO	DETERMINE SG #4 is ruptured.
		• Unexpected increase in SG #4 narrow range level.
		• High radiation from SG #4 Main steamline.
CRITICAL TASK	RO/BOP	ISOLATE Flow From Ruptured SG #4.
		• ADJUST ruptured SG #4 atmospheric controller setpoint to 1160 psig.
		• CHECK ruptured SG #4 atmospheric – CLOSED.
	RO/BOP	CLOSE ruptured SG #4 main steamline isolation, associated bypass and SG drip pot isolation valves.
	RO/BOP	PLACE steam supply valve handswitch from ruptured SG #4 to Turbine Driven AFW pump in PULL OUT.

Op Test No.:	NRC	Scenario #	1	Event #	5, 6, 7 and 8	Page	20	of	24

Event Description: Steam Generator Tube Rupture/Loss of Transformer 1ST/ PORV Failure/Train A SI Pump Failure

Time	Position	Applicant's Actions or Behavior
	RO/BOP	VERIFY blowdown isolation valve(s) from ruptured SG #4 – CLOSED.
	RO/BOP	CHECK Ruptured SG #4 Level:
		• VERIFY narrow range level > 10%.
		• SECURE AFW flow to SG #4.
	RO/BOP	CHECK SG #4 Pressure > 420 PSIG.
	US	INITIATE RCS Cooldown.
	RO/BOP	When PRZR pressure decreases to less than 1960 psig, BLOCK the low steamline pressure SI signal.
	US	DETERMINE required core exit thermocouple (CET) temperature.
		Lowest Ruptured SG Pressure / **Core Exit Temperature** **1200** / **495ºF** **1150** / **490ºF** **1100** / **485ºF** **1000** / **475ºF**
	BOP	DUMP steam at maximum rate from intact SGs using atmospheric relief valves.
	US/RO	DETERMINE required CET temperature is met.
	RO	STOP RCS cooldown.

Op Test No.:	NRC	Scenario #	1	Event #	5, 6, 7 and 8	Page	21	of	24

Event Description: Steam Generator Tube Rupture/Loss of Transformer 1ST/ PORV Failure/Train A SI Pump Failure

Time	Position	Applicant's Actions or Behavior
	RO/BOP	MAINTAIN required CET temperature .
	RO/BOP	CHECK Intact SG Levels:
		• Narrow range level > 10%.
		• CONTROL AFW flow to maintain narrow range level between 30% and 50%.
	RO	CHECK PRZR PORVs and Block Valves:
		• Power to block valves AVAILABLE.
		• PORVs – CLOSED.
		• Block valves – AT LEAST ONE OPEN.
	RO/BOP	PLACE Train A DG EMERG STOP/START Handswitch in START.
	RO/BOP	RESET SI.
	RO/BOP	RESET SI Sequencers.
	RO/BOP	RESET Containment Isolation Phase A and Phase B.
	RO/BOP	RESET Containment Spray Signal.
	RO/BOP	ESTABLISH Instrument Air and Nitrogen to Containment.
	RO	CHECK If RHR Pumps Should Be Stopped:
		• RHR pumps – ANY RUNNING WITH SUCTION ALIGNED TO RWST.
		• RCS pressure – GREATER THAN 325 PSIG.
		• STOP RHR pumps and place in standby.

Op Test No.:	NRC	Scenario #	1	Event #	5, 6, 7 and 8	Page	22	of 24
Event Description:	Steam Generator Tube Rupture/Loss of Transformer 1ST/ PORV Failure/Train A SI Pump Failure							

Time	Position	Applicant's Actions or Behavior
		• RESET RHR auto switchover.
	US	CHECK if RCS Cooldown Should Be Stopped:
		• VERIFY required CET temperature.
		• STOP RCS cooldown.
		• MAINTAIN required CET temperature.
	US/RO	CHECK Ruptured SG #4 Pressure – STABLE OR INCREASING.
	US/RO	CHECK RCS Subcooling > 45°F.
+40 min	RO	DEPRESSURIZE RCS Using PRZR PORV to Minimize Break Flow and Refill PRZR:
		• PRZR PORV – AT LEAST ONE AVAILABLE.
		• PLACE all PRZR heater switches in OFF position.
		• OPEN one PRZR PORV until <u>ANY</u> of the following conditions satisfied:
		• <u>BOTH</u> of the following:
		• RCS pressure < SG #4 pressure and PRZR level > 13%; OR
		• PRZR Level > 75%; OR
		• RCS subcooling – AT 25°F
		• CLOSE PRZR PORV.
	RO	DETERMINE PRZR PORV will NOT close.
	RO	CLOSE PORV block valve.
	RO	DETERMINE PRZR PORV block valve will NOT close.

Op Test No.:	NRC	Scenario #	1	Event #	5, 6, 7 and 8	Page	23	of 24
Event Description:	Steam Generator Tube Rupture/Loss of Transformer 1ST/ PORV Failure/Train A SI Pump Failure							

Time	Position	Applicant's Actions or Behavior
	US/RO	DETERMINE RCS Pressure – DECREASING.
	US	TRANSITION to ECA-3.1A, SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired, Step 1.
NOTE:	**ECA-3.1A, SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired steps begin here.**	
	US/RO	DETERMINE ECA-3.1A, SI Reset steps already completed.
	BOP	DETERMINE All AC Busses NOT energized by offsite power.
	US	DIRECT restoration of offsite power per ABN-601, Response to A 138/345 KV System Malfunction.
	RO	DEENERGIZE PRZR Heaters:
		• PLACE all PRZR heater switches in OFF position.
		• CONSULT Plant Staff for a recommended minimum indicated PRZR water level that will ensure heaters are covered.
	RO	CHECK Ruptured SG(s) Level:
		• VERIFY narrow range level > 10%.
		• STOP AFW flow to ruptured SG(s).
	RO	DETERMINE RHR Pumps already Stopped.
	US	INITIATE Evaluation of Plant Status:
		• CHECK auxiliary building and safeguards building radiation – NORMAL:

Op Test No.:	NRC	Scenario #	1	Event #	5, 6, 7 and 8	Page	24	of 24
Event Description:	Steam Generator Tube Rupture/Loss of Transformer 1ST/ PORV Failure/Train A SI Pump Failure							

Time	Position	Applicant's Actions or Behavior
		• CHECK PC-11 area monitors – NORMAL (GRID 4)
		• NOTIFY Radiation Protection to take local radiation surveys.
		• NOTIFY Chemistry to obtain RCS samples to assist in determining extent of the accident.
		• EVALUATE plant equipment:
	US	DETERMINE no SG is faulted with intact SGs in proper level range.
CRITICAL TASK	US/RO	INITIATE RCS Cooldown to Cold Shutdown:
		• MAINTAIN cooldown rate in RCS cold legs < 100°F/HR.
		• DUMP steam to atmosphere via ARVs from intact SGs.
+50 min	US/RO	CHECK If Subcooled Recovery Is Appropriate:
		• CHECK RWST level > 74%.
		• CHECK ruptured SG narrow range level < 90%.
	US/RO	CHECK RCS Subcooling > 25°F (>55°F if adverse condition exists).
	US/RO	CHECK If ECCS Is In Service:
		• VERIFY SI pumps – RUNNING.
		• VERIFY CCP injection line – NOT ISOLATED.
	US/RO	DEPRESSURIZE RCS To Refill PRZR.
When RCS Cooldown is in progress, TERMINATE the scenario.		

UNIT: 1

UNIT SUPERVISOR RELIEF CHECKLIST (NRC Scenario #1)

PART I TO BE PREPARED BY THE OFF-GOING UNIT SUPERVISOR.

1.0 SHIFT ACTIVITIES:

1.1 **Activities Completed This Shift:** **None**

1.2 **Activities In-Progress:** **None**

1.3 **Planned Activities:** **OPT-217A, Turbine Valve Testing; Operations Management and Core Performance Group recommends 5 MWe/minute load reduction rate (25%/hour); Maintain control rods in AUTO.**

2.0 PLANT AND EQUIPMENT STATUS:

2.1 Technical Specification Related Equipment Summary:
PRZR PORV 1/1-PCV-456 closed, isolated and yellow tagged due to seat leakage.
PRZR PORV Block Valve 1/1-8000B closed and yellow tagged. Block valve has been closed for 30 hours to re-establish loop seal per 1-ALB-5B-3.1, PRZR OUTLET TEMP HI.

2.2 Non-Technical Specification Equipment Summary:

3.0 GENERAL INFORMATION:
Power reduction at 25%/hour for OPT-217A, Turbine Valve Testing.

4.0 END OF SHIFT REVIEW:

LOGS – RO/BOP	X	LOGS-PEO	X	CLOSED eLCOARs ARCHIVED	X
OPTS COMPLETED	X	DAILY ACTIVITIES LIST	X	LCOARs REVIEWED	X

PART II TO BE COMPLETED BY THE ON-COMING UNIT SUPERVISOR.

1.0 CRITICAL PARAMETERS:

MODE:	1	REACTOR POWER:	100%	MWE:	1220
RCS TAVE:	589 °F	CONTROL ROD POSITION	215	ON BANK	D
C_b:	906 ppm	RCS PRESS:	2235 psig		

[X] Protected Train – Train A
[X] Risk Assessment GREEN
[X] Unit 2 is in Mode 1 @ 100% power
[X] BAT C_B = 7447 ppm

Facility:	CPSES	Scenario No.:	2	Op Test No.:	NRC
Examiners:		Operators:			

Initial Conditions:
- 54% power - RCS Boron is 1052 ppm by Chemistry Sample.
- Power Operated Relief Valve (PCV-456) closed and isolated due to seat leakage.

Turnover:
- Maintain steady-state operation.

Critical Tasks:
- Determines Steam Generator #2 is faulted and isolates the Steam Generator.
- Determines Containment Isolation Signal fails to actuate and manually actuates.
- Determines required conditions met for tripping RCPs.

Event No.	Malf. No.	Event Type*	Event Description
1 +10 min	RX09A	I (ALL)	Main Turbine 1st Stage Pressure Transmitter (PT-505) fails low.
2 +20 min	RX15B	C (RO, SRO) TS (SRO)	Pressurizer Spray Valve (PCV-455C) fails 40% open.
3 +30 min	EG01	C (BOP, SRO)	Main Generator Voltage Regulator fails high.
4 +40 min	RX05A	I (RO, SRO) TS (SRO)	Pressurizer Level Channel (LT-459A) fails low.
5 +50 min	MS01B	M (ALL)	Faulted Steam Generator #2 inside Containment.
6 +55 min	RP09A/B RP18A	C (BOP)	Containment Isolation Valves fail to close.

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

SCENARIO SUMMARY NRC #2

The crew will assume the shift with steady-state conditions per Integrated Plant Operating (IPO) procedure IPO-003A, Power Operations.

The first event is a Main Turbine 1st Stage Pressure Transmitter (PT-505) failure. The crew responds per Abnormal Conditions Procedure (ABN) ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st-Stage Pressure and Feed Header Pressure Instrument Malfunction. Several actions are required on the part of the RO and BOP to stabilize plant conditions.

When the plant is stable, a Pressurizer Spray Valve will fail open. The crew will enter ABN-705, Pressurizer Pressure Malfunction and take manual control of the Spray Valve. The SRO will be required to evaluate Technical Specifications.

The next event is a Main Generator Voltage Regulator failure. The crew will respond per ABN-402, Main Generator Malfunction. The BOP will take manual control of the voltage regulator to manage Main Generator VARs and voltage within specification.

When control of Main Generator is obtained, a Pressurizer level channel will fail low. The crew should respond to the channel failure in accordance with ABN-706, Pressurizer Level Instrumentation Malfunction. Actions include manual control of Charging by the RO. The SRO will evaluate Technical Specifications.

When the channel failure actions are complete, a Steam Line Break inside Containment on Steam Generator #2 will occur. The crew will enter EOP-0.0A, Reactor Trip or Safety Injection and then transition to EOP-2.0A, Faulted Steam Generator Isolation. Once the Steam Generator is isolated the crew will transition to EOS-1.1A, Safety Injection Termination.

An automatic failure of both Trains of Containment Isolation Valves will require actions on the part of the BOP.

Event termination will occur when the crew has completed actions for securing high head Safety Injection.

Risk Significance:

- Risk important components out of service: PORV isolated due to seat leakage
- Failure of risk important system prior to trip: Pressurizer Spray Valve fails open
- Risk significant core damage sequence: PTS due to faulted Steam Generator
- Risk significant operator actions: Manually initiate Containment Isolation
Stop all RCPs on loss of cooling

CPSES
2007 Facility NRC Initial License Examination
Simulator Scenario Setup
Scenario 2

BOOTH OPERATOR'S INSTRUCTIONS

SETUP

IC: Use IC #17 and see attached Event File for NRC Scenario #2.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
0		RP09A	Automatic CIS Phase A Train A actuation failure	1	K0
		RP09B	Automatic CIS Phase A Train B actuation failure	1	K0
		RP18A	Manual CIS/CVS Phase A Train A failure	1	K0
1		RX09A	PT-505 failure	0%	K1
		LOMSZL 2369B_2	Steam Dump Valve 1-PV-2369B fails partially open (override indication)		K1
2		RX15B	Pressurizer Spray Valve failure	40%	K2
2		AORXPK 455C	1-PK-455C Output to 40% (override panel indication to 40% when in AUTO)	40% **NOTE 1**	K2
NOTE 1: Failure is removed when MANUAL is depressed.					
3		EG01	Main Generator Voltage Regulator failure	1	K3
4		RX05A	Pressurizer Level Channel (LT-459A) failure	0%	K4
5		MS01B	SG #2 Steam Line Break Inside Containment	$1.5E^{6}$	K5

Op Test No.: NRC	Scenario # 2	Event # 1	Page 4 of 21
Event Description:	Main Turbine Pressure Transmitter Failure		

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**EXECUTE IC #17 and NRC Scenario #2 SETUP file.** **ENSURE all Simulator Annunciator Alarms are ACTIVE.** **ENSURE Control Board Tags are hung:** **- Yellow Tag PRZR PORV PCV-456.** **- Yellow Tag and CLOSE PRZR Block Valve 1-8000B.** **ENSURE Operator Aid Tags (RCS & PRZR Cb) reflect current plant conditions.** **ENSURE Control Rods are in AUTO.** **ENSURE Turbine Load Rate set at 10 MW / minute.** **ENSURE Computer next to Turbine DCS is booted.** **ENSURE procedures in progress are on the RO desk:** **- Copy of IPO-003A, Power Operations, Section 5.5, Operating at Constant Turbine Load.**
Control Room Annunciators in Alarm at 54%: **PCIP-1.1 – SR TRN A RX TRIP BLK** **PCIP-1.2 – IR TRN A RX TRIP BLK** **PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9** **PCIP-1.6 – RX ≥ 10% PWR P-10** **PCIP-2.1 – SR TRN B RX TRIP BLK** **PCIP-2.2 – IR TRN B RX TRIP BLK** **PCIP-2.5 – SR RX TRIP BLK PERM P-6** **PCIP-3.2 – PR TRN A LO SETPT RX TRIP BLK** **PCIP-4.2 – PR TRN B LO SETPT RX TRIP BLK** **9A-8.10 – ES TO AUX STM D/P VLV OPEN** **9A-3.2 – HDP 1 DISCH PRESS HI (flashing per Shift Turnover sheet)** **9A-7.2 – HDP 2 DISCH PRESS HI (flashing per Shift Turnover sheet)**		
Booth Operator:		**When directed, EXECUTE RX09A, Main Turbine Pressure Transmitter (PT-505) fails low (0%).**
Indications available: **6D-1.10 – AVE T_{AVE} T_{REF} DEV** **PCIP-2.4 – LO TURB PWR ROD WITHDRW BLK C-5** **1-PI-505 – Turbine Impulse Pressure Channel I indication fails low** **1-TI-412A – Ave T_{AVE} T_{REF} Deviation indication to maximum**		
+30 secs	RO/BOP	RESPOND to Annunciator Alarms.

Op Test No.: NRC	Scenario # 2	Event # 1	Page 5 of 21
Event Description:	Main Turbine Pressure Transmitter Failure		

Time	Position	Applicant's Actions or Behavior
	RO/BOP	RECOGNIZE control rods inserting in AUTO due to turbine impulse pressure instrument malfunction.
	RO/BOP	REPORT failure of PT-505, Turbine Impulse Pressure Channel I (LOW).
	US	RECOGNIZE Turbine Impulse Pressure Instrument Malfunction and DIRECT implementation of ABN-709, Section 4.0.
	RO	DETERMINE control rods inserting in AUTO and PLACE 1/1-RBSS Control Rod Bank Select Switch in MANUAL.
	BOP	DETERMINE Steam Dump Valve 1-PV-2369B is OPEN per ZL indicating lights and PLACE 43/1-SDA and/or 43/1-SDB Steam Dump Interlock Select Switch in OFF.
	BOP	PLACE Steam Dump in Steam Pressure Mode.
	BOP	ENSURE Steam Dump Interlock Selector Switches in ON.
	US	DIRECT transfer of 1-PS-505Z, Turbine Impulse Pressure Channel Select to PT-506.
	RO	PLACE PT-506, Turbine Impulse Pressure Channel II in service.
+10 min	RO	ENSURE Tave within 1ºF of Tref then PLACE 1/1-RBSS Control Rod Bank Select Switch in AUTO.

Op Test No.:	NRC	Scenario #	2	Event #	1	Page	6	of 21
Event Description:	Main Turbine Pressure Transmitter Failure							

Time	Position	Applicant's Actions or Behavior
	US	Within 1 hour, VERIFY PCIP window 4.6, TURB ≤ 10% PWR P-13 in proper state for existing plant conditions (DARK).
		• LCO 3.3.1.T, Reactor Trip System Instrumentation. (1 hour ACTION).
		• Table 3.3.1-1, Item 18f: With one or more required channel(s) *inoperable*, verify interlock is in required state for existing unit conditions.
+10 min	US	VERIFY PCIP window 1.3, AMSAC BLK TURB < 40% PWR C-20 (LIT).
		• If AMSAC actuation blocked <u>and</u> Turbine power >40%, ENSURE Automatic Actions of ALB-9B 3.7, AMSAC ACT TURB TRIP as necessary.
When the pressure transmitter failure actions are addressed, or at Lead Evaluator's discretion, PROCEED to Event 2.		

Op Test No.: NRC	Scenario # 2	Event # 2	Page 7 of 21
Event Description:	Pressurizer Spray Valve Fails Open		

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE RX15B, Pressurizer Spray Valve (PCV-455C) fails to 40% open.**
Indications available: **5B-1.6 – PRZR LO PRESS PORV 456 BLK** **5B-2.6 – PRZR LO PRESS PORV 455A BLK** **5C-3.3 – PRZR PRESS LO BACKUP HTRS ON** **Plant Computer System low PRZR pressure alarms**		
+1 min	RO	RESPOND to Annunciator Alarms.
+3 min	RO	RECOGNIZE PZR pressure decreasing and DETERMINE Pressurizer Spray Valve (PCV-455C) malfunction.
	RO	REPORT Pressurizer Spray Valve (PCV-455C) failed ~40% open.
	US	DIRECT implementation of ABN-705, Pressurizer Pressure Malfunction, Section 3.0.
	RO	PLACE PK-455C in MANUAL and CLOSE the PZR Spray Valve.
	RO	ENSURE all PZR heaters ON.
	RO	VERIFY PZR pressure increasing to 2235 psig.

Op Test No.:	NRC	Scenario #	2	Event #	2	Page	8	of	21
Event Description:	Pressurizer Spray Valve Fails Open								

Time	Position	Applicant's Actions or Behavior
NOTE:		**This is a transient Technical Specification that may be cleared before the event is completed.**
+10 min	US	EVALUATE Technical Specifications.
		• LCO 3.4.1, RCS Pressure, Temperature and Flow Departure from Nuclear Boiling (DNB) Limits are applicable (2 hour ACTION).
		• Restore RCS DNB parameter(s) to within limits.
When the Pressurizer Pressure malfunction actions are addressed, or at Lead Evaluator's discretion, PROCEED to Event 3.		

Op Test No.:	NRC	Scenario #	2	Event #	3	Page	9	of	21
Event Description:	Main Generator Voltage Regulator Failure								

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE EG01, Main Generator Voltage Regulator fails high.**
Indications available: **Digital Control Room Alarm Summary Display Alarms:** **1SP10C003 – EXCITER STATOR FAULT** **1SP10C004 – EXCITER DYNAMIC FAULT**		
+1 min	BOP	RESPOND to Annunciator Alarms.
	BOP	RECOGNIZE Main Generator Voltage Regulator malfunction and REPORT failure to crew.
	US	DIRECT implementation of ABN-402, Main Generator Malfunction, Section 2.0.
	BOP	VERIFY Main Generator synchronized to grid.
	BOP	DETERMINE 1SP10C003 – EXCITER STATOR FAULT is in alarm.
B.O. Cue:		**CONTACT the Control Room as Electrical Engineering and REPORT that the Exciter Stator Fault alarm is erroneous. DIRECT the Unit Supervisor that the Unit is to remain on line and to continue in the main body of ABN-402.**
	BOP	TRANSFER voltage regulator transferred to MANUAL.
		• On the TG Control Display, VERIFY Exciter Current Target is matched with Exciter Amps.
		• In the "Voltage Control" Section, SHIFT Voltage Control to Manual using the AUTO/MAN Subloop Controller. (Manual is green).

Op Test No.:	NRC	Scenario #	2	Event #	3	Page	10	of	21
Event Description:	Main Generator Voltage Regulator Failure								

Time	Position	Applicant's Actions or Behavior
+10 min	BOP	RESTORE main generator parameters to within limits.
When the voltage regulator failure actions are addressed, or at Lead Evaluator's discretion, PROCEED to Event 4.		

Op Test No.: NRC	Scenario # 2	Event # 4	Page 11 of 21
Event Description:	Pressurizer Level Channel Failure		

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE RX05A, Pressurizer Level Channel (LT-459A) fails low (0%).**
Indications available: **5B-1.4 – PRZR HTR GRP C CTRL TRBL** **5B-3.6 – PRZR LVL LO** **5C-1.2 – PRZR LVL DEV LO** **6A-3.8 – CVCS HELB PS-5385A** **6A-3.4 – CVCS HELB PS-5385**		
+1 min	RO	RESPOND to Annunciator Alarms.
	RO	RECOGNIZE PZR level increasing and DETERMINE Pressurizer Level Channel (LT-459A) malfunction.
	RO	REPORT Pressurizer Level Channel I (LT-459A) failed low.
	US	DIRECT implementation of ABN-706, Pressurizer Level Instrumentation Malfunction, Section 2.0.
	RO	Manually CONTROL PZR Level Control or Charging Flow to maintain level on program.
	RO	TRANSFER 1/1-LS-459D, PZR Level Control Channel Select to an OPERABLE channel.
	RO	TRANSFER 1/1-LS-459E, 1/1-LR-459 PZR Level Select to an OPERABLE channel.
	RO	DETERMINE normal Letdown NOT aligned and when PRZR level is > 17%, RESTORE Letdown per Attachment 6.
		• OPEN or VERIFY OPEN both Letdown isolation valves.
		• ENSURE 1-PK-131, LTDN HX OUT PRESS CTRL in MANUAL and 30% (75 gpm) or 50% (120 gpm) demand.

Op Test No.: NRC	Scenario # 2	Event # 4	Page 12 of 21
Event Description:	Pressurizer Level Channel Failure		

Time	Position	Applicant's Actions or Behavior
		• ENSURE 1-TK-130, LTDN HX OUT TEMP CTRL in MANUAL and 50% demand.
		• ADJUST Charging to desired flow while maintaining seal injection flow between 6 and 13 gpm.
		• OPEN the desired orifice isolation valves.
		• ADJUST 1-PK-131, LTDN HX OUT PRESS CTRL to obtain approximately 310 psig on 1-PI-131, LTDN HX OUT PRESS, then place in AUTOMATIC.
		• ADJUST 1-TK-130, LTDN HX OUT TEMP CTRL to obtain approximately 95°F on 1-TI-130, LTDN HX OUT TEMP, then place in AUTOMATIC.
	RO	RESTORE PZR Control Heater Group C.
	RO	RESTORE PZR Level Control or Charging flow control to AUTO as desired.
	US/RO	VERIFY appropriate alarm and trip status lights illuminated per Attachment 4.
+10 min	US	EVALUATE Technical Specifications.
		• LCO 3.3.1.M, Reactor Trip System Instrumentation is applicable (72 hour ACTION).
		• Table 3.3.1-1, Item 9; with one channel *inoperable*, place channel in trip.
When the Technical Specifications are addressed, or at Lead Evaluator's discretion, PROCEED to Events 5 and 6.		

Op Test No.: NRC	Scenario # 2	Event # 5 and 6	Page 13 of 21
Event Description:	Steam Line Break Inside Containment / Containment Isolation Signal Failure		

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE MS01B, Steam Generator #2 Steam Line Break inside Containment at 100%.**
Indications available: **8A-2.7 – MSL 2 1 OF 3 PRESS LO** **Numerous Reactor and Turbine Trip alarms**		
+1 min	ALL	RECOGNIZE steam flow decreasing on Steam Generator #2 and rising pressure inside Containment
	RO/BOP	DETERMINE Reactor trip due to steam line break inside Containment.
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
	RO	VERIFY Reactor Trip:
		• Reactor trip breakers – OPEN
		• Neutron flux - DECREASING
	RO	VERIFY ALL control rod position rod bottom lights – ON.
	BOP	VERIFY Turbine Trip:
		• All HP turbine stop valves – CLOSED.
	BOP	VERIFY Power to AC Safeguards Busses:
		• AC safeguards busses – BOTH ENERGIZED.
	RO	DETERMINE both Trains of SI actuated.
NOTE:		**EOP-0.0A, Attachment 2 steps performed by the BOP are identified later in the scenario.**

Op Test No.: NRC	Scenario # 2	Event # 5 and 6	Page 14 of 21
Event Description:	Steam Line Break Inside Containment / Containment Isolation Signal Failure		

Time	Position	Applicant's Actions or Behavior
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2.
	RO	VERIFY AFW Alignment:
		• MDAFW Pumps – RUNNING
		• Turbine Driven AFW Pump – RUNNING IF NECESSARY
		• CONTROL AFW total flow as follows:
		• CONTROL AFW total flow as necessary to maintain a Narrow Range level > 10% in any SG or AFW total flow > 460 gpm per Foldout Page.
		• STOP AFW flow to faulted SG #2 per Foldout Page.
		• If not required, SECURE TDAFWP per Foldout Page.
		• MAINTAIN proper AFW valve alignment.
	RO	DETERMINE Containment Spray Required:
		• DETERMINE Containment pressure >18.0 PSIG
		• VERIFY Containment Spray AND Phase B Actuation initiated.
		• VERIFY appropriate MLB indication for CNTMT SPRAY (blue windows) AND PHASE B (orange windows).
		• VERIFY Containment Spray flow.
		• ENSURE CHEM ADD TK DISCH VLVs - OPEN
		• 1-HS-4752 and 1-HS-4753.
CRITICAL TASK		• STOP all RCPs.
	RO	DETERMINE Main Steam lines should be Isolated and PERFORM the following:
		• VERIFY main steam isolation complete:
		• Main Steam isolation valves CLOSED.
		• Main Steam isolation bypass valves CLOSED.

Op Test No.: NRC	Scenario # 2	Event # 5 and 6	Page 15 of 21
Event Description:	Steam Line Break Inside Containment / Containment Isolation Signal Failure		

Time	Position	Applicant's Actions or Behavior
		• Before MSIV drippot isolation valves CLOSED.
	RO	CHECK RCS Temperature -
		• RCS AVERAGE TEMPERATURE less than 557°F.
	RO	STOP dumping steam.
	RO	REDUCE total AFW flow to minimize the cooldown:
		• MAINTAIN a minimum of 460 gpm UNTIL narrow range level greater than 26% in at least one SG.
		• If necessary, STOP Turbine Driven AFW pump.
	RO	CHECK PRZR Valve Status:
		• PRZR Safeties – CLOSED
		• NORMAL PRZR spray valves – CLOSED.
		• PORVs - CLOSED
		• Power to at least one block valve – AVAILABLE
		• Block valves – AT LEAST ONE OPEN
	RO	DETERMINE RCPs Should Be Stopped:
		• ECCS pumps – AT LEAST ONE RUNNING
		• CCP and SI pumps RUNNING
		• RCS subcooling > 55°F
		• VERIFY all RCPs stopped.
	RO	CHECK If Any SG Is Faulted:
		• DETERMINE SG #2 COMPLETELY DEPRESSURED.
	US	TRANSITION to EOP 2.0A, FAULTED STEAM GENERATOR ISOLATION, Step 1.

Op Test No.: NRC	Scenario # 2	Event # 5 and 6	Page 16 of 21
Event Description:	Steam Line Break Inside Containment / Containment Isolation Signal Failure		

Time	Position	Applicant's Actions or Behavior
NOTE:	**These steps are performed by the BOP as required per EOP-0.0A, Attachment 2. EOP-2.0A steps are identified later in the scenario.**	
	BOP	VERIFY SSW Alignment:
		• VERIFY SSW Pumps – RUNNING
		• VERIFY diesel generator cooler SSW return flow.
	BOP	VERIFY Safety Injection Pumps - RUNNING
	BOP	DETERMINE Containment Isolation Phase A – DID NOT ACTUATE
NOTE:	**Containment Isolation Phase A can be initiated from either the Actuate Switch at CB-07 or using Attachment 4. The Phase A Actuate Switch at CB-02 is disabled.**	
CRITICAL TASK	BOP	Manually ACTUATE Phase A at CB-07 or per Attachment 4.
		• VERIFY Phase A Actuation
	BOP	VERIFY Containment Ventilation Isolation.
	BOP	VERIFY CCW Pumps – RUNNING.
	BOP	VERIFY RHR Pumps – RUNNING.
	BOP	VERIFY Proper CVCS Alignment:
		• VERIFY CCPs – RUNNING
		• VERIFY Letdown Relief Valve isolation:
		• Letdown orifice isolation valves – CLOSED

Op Test No.: NRC	Scenario # 2	Event # 5 and 6	Page 17 of 21
Event Description:	Steam Line Break Inside Containment / Containment Isolation Signal Failure		

Time	Position	Applicant's Actions or Behavior
		• Letdown isolation valves - CLOSED
		• 1/1-LCV-459 and 1/1-LCV-460
	BOP	VERIFY ECCS flow:
		• VERIFY CCP SI flow indicator.
		• VERIFY RCS pressure < 1800 PSIG.
		• VERIFY SIP discharge flow indicators.
		• VERIFY RCS pressure < 425 PSIG.
	BOP	VERIFY Feedwater Isolation Complete:
		• VERIFY feedwater isolation valves CLOSED.
		• VERIFY feedwater isolation bypass valves CLOSED.
		• VERIFY feedwater preheater bypass valves CLOSED.
		• VERIFY feedwater bypass control valves CLOSED.
		• VERIFY feedwater control valves CLOSED.
		• VERIFY feedwater split flow bypass valves CLOSED.
	BOP	VERIFY Diesel Generators – RUNNING.
	BOP	VERIFY Monitor Lights For SI Load Shedding illuminated.
	BOP	VERIFY Proper SI alignment per MLB light indication.
	BOP	VERIFY Safety Injection components alignment per Table 1.
NOTE:	**EOP-2.0A, Faulted Steam Generator Isolation steps begin here.**	
+15 min	US/RO	CHECK Main Steamline Isolation and Bypass Valves CLOSED.

Op Test No.: NRC	Scenario # 2	Event # 5 and 6	Page 18 of 21
Event Description:	Steam Line Break Inside Containment / Containment Isolation Signal Failure		

Time	Position	Applicant's Actions or Behavior
	US/RO	CHECK at Least One SG Pressure STABLE OR INCREASING.
	US/RO	IDENTIFY Faulted SG #2.
CAUTION:	**If the turbine-driven AFW pump is the only available source of feed flow, steam supply to the turbine-driven AFW pump must be maintained from at least one SG.**	
CRITICAL TASK	RO	ISOLATE Faulted SG #2.
		• ISOLATE main feedline to SG #2.
		• ISOLATE AFW flow to SG #2.
		• ISOLATE Blowdown and sample lines to SG #2.
		• ENSURE SG #2 atmospheric CLOSED.
		• ENSURE main steam line drippot isolation valve CLOSED.
	RO	CHECK CST Level – GREATER THAN 10%.
	US/RO	VERIFY Faulted SG #2 Break Inside Containment.
	RO	CHECK Secondary Radiation:
		• REQUEST periodic activity samples of all SGs.
		• CHECK available secondary radiation monitors - NORMAL
	US/RO	CHECK if ECCS Flow to Should Be Reduced:
		• Secondary heat sink:
		• Total AFW flow to intact SGs > 460 GPM; OR
		• Narrow range level in at least one intact SG > 26%
		• RCS subcooling > 55°F.
		• RCS pressure – STABLE <u>OR</u> INCREASING

Op Test No.: NRC	Scenario # 2	Event # 5 and 6	Page 19 of 21
Event Description:	Steam Line Break Inside Containment / Containment Isolation Signal Failure		

Time	Position	Applicant's Actions or Behavior
		• PRZR level > 34%.
	US	TRANSITION to EOS-1.1A, Safety Injection Termination, Step 1.
NOTE:	**EOS-1.1A, Safety Injection Termination steps begin here.**	
	BOP	If diesels are RUNNING, PLACE Both DG EMER STOP/START Handswitches In START.
	BOP	RESET SI.
	BOP	RESET SI Sequencers.
	BOP	RESET Containment Isolation Phase A and B.
	BOP	RESET Containment Spray Signal.
	BOP/RO	ESTABLISH instrument Air And Nitrogen To Containment.
	RO	STOP All But One CCP And PLACE In Standby.
	US/RO	CHECK RCS Pressure – STABLE OR INCREASING
	RO	ISOLATE CCP Injection Line Flow Path:
		• CHECK CCP – SUCTION ALIGNED TO RWST
		• ALIGN CCP miniflow valves:
		• OPEN CCP miniflow valves, 1/1-8110 and 1/1-8111.
		• CLOSE CCP alternate miniflow isolation valves, 1/1-8511A and 1/1-8511B.
		• PLACE charging flow control valve in manual and 35%

Op Test No.: NRC	Scenario # 2	Event # 5 and 6	Page 20 of 21
Event Description:	Steam Line Break Inside Containment / Containment Isolation Signal Failure		

Time	Position	Applicant's Actions or Behavior
		demand.
		• CLOSE the CCP injection line isolation valves:
		• 1/1-8801A and 1/1-8801B
	RO	ESTABLISH Charging Flow Path:
		• OPEN charging line isolation valves, 1/1-8105 and 1/1-8106.
		• ADJUST charging flow control valve to establish charging flow.
		• ADJUST RCP seal flow to RCPs to maintain between 6 gpm and 13 gpm.
	RO	CONTROL Charging Flow to Maintain PRZR Level.
	RO	CHECK IF SI Pumps Should Be Stopped:
		• CHECK RCS pressure:
		• Pressure – STABLE OR INCREASING
		• Pressure > 1800 PSIG
		• STOP SI pumps and PLACE in standby.
	RO	CHECK If RHR Pumps Should Be Stopped:
		• RHR pumps RUNNING with suction aligned to RWST
		• STOP RHR pumps and place in standby.
		• RESET RHR auto switchover.
	RO	VERIFY ECCS Flow Not Required:
		• RCS subcooling > 55°F.
		• PRZR level > 34%.

Op Test No.:	NRC	Scenario #	2	Event #	5 and 6	Page	21	of 21
Event Description:	Steam Line Break Inside Containment / Containment Isolation Signal Failure							

Time	Position	Applicant's Actions or Behavior
+30 min	RO	CHECK If Letdown Can Be Established:
		• PRZR level > 50%.
NOTE:	**Depending on scenario timing, the crew may be preparing to enter EOS-1.3A, Transfer to Cold Leg Recirculation. See termination criteria below.**	
When high head Safety Injection is isolated or upon entry into EOS-1.3A, TERMINATE the scenario.		

UNIT: 1

UNIT SUPERVISOR RELIEF CHECKLIST (NRC Scenario #2)

PART I TO BE PREPARED BY THE OFF-GOING UNIT SUPERVISOR.

1.0 SHIFT ACTIVITIES:

1.1 **Activities Completed This Shift:** None

1.2 **Activities In-Progress:** None

1.3 **Planned Activities:** None

2.0 PLANT AND EQUIPMENT STATUS:

2.1 Technical Specification Related Equipment Summary:

PRZR PORV 1/1-PCV-456 closed, isolated and yellow tagged due to seat leakage.

PRZR PORV Block Valve 1/1-8000B closed and yellow tagged. Block valve has been closed for 30 hours to re-establish loop seal per 1-ALB-5B-3.1, PRZR OUTLET TEMP HI.

2.2 Non-Technical Specification Equipment Summary:

Shift Manager has authorized Heater Drain Pump alarms to flash while at this power level.

3.0 GENERAL INFORMATION:

Maintain steady state conditions per IPO-003A, Power Operation.

4.0 END OF SHIFT REVIEW:

LOGS – RO/BOP	X	LOGS-PEO	X	CLOSED eLCOARs ARCHIVED	X
OPTS COMPLETED	X	DAILY ACTIVITIES LIST	X	LCOARs REVIEWED	X

PART II TO BE COMPLETED BY THE ON-COMING UNIT SUPERVISOR.

1.0 CRITICAL PARAMETERS:

MODE:	1	REACTOR POWER:	54%	MWE:	600
RCS TAVE:	574 °F	CONTROL ROD POSITION	176	ON BANK	D
C_b:	1052 ppm	RCS PRESS:	2235 psig		

[X] Protected Train – Train A
[X] Risk Assessment GREEN
[X] Unit 2 is in Mode 1 @ 100% power
[X] BAT C_B = 7447 ppm

Facility:	CPSES	Scenario No.:	3	Op Test No.:	NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		

Initial Conditions:	• $1x10^{-8}$ amps - RCS Boron is 1806 ppm by Chemistry Sample.
Turnover:	• Rod withdrawal and power increase to ~2% power.
Critical Tasks:	• Determine Reactor Coolant Pump trip, manual Reactor Trip required. • Determine inadvertent SI and secures Charging prior to Pressurizer overfill. • Determine LOCA in progress and reinitiates Safety Injection.

Event No.	Malf. No.	Event Type*	Event Description
1 +20 min		R (RO) N (BOP, SRO)	Rod withdrawal and power increase to ~2% power.
2 +30 min	FW24A	C (BOP, SRO) TS (SRO)	Motor-driven Auxiliary Feedwater Pump (1-01) trip.
3 +40 min	CV01B	C (RO, SRO) TS (SRO)	Centrifugal Charging Pump (1-01) trip.
4 +45 min	RC15C	C (RO, SRO)	Reactor Coolant Pump (1-03) seized shaft, manual Reactor Trip required.
5 +45 min	RP14B	M (ALL)	Spurious Train B Safety Injection actuation upon Reactor Trip.
6 +50 min	CC02D	C (BOP)	Component Cooling Water Pump (1-02) fails to start from sequencer.
7 +65 min	RC17C	M (ALL)	Loss of Coolant Accident at 1700 gpm following isolation of high head injection.

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

SCENARIO SUMMARY NRC #3

The crew will assume the shift with the Reactor critical at $1x10^{-8}$ amps and then raise power to approximately 2% per Integrated Plant Operating (IPO) procedure IPO-002A, Plant Startup from Hot Standby.

The first event is a trip of the running Auxiliary Feedwater Pump. The crew will refer to Abnormal Conditions Procedure (ABN) ABN-305, Auxiliary Feedwater System Malfunction and place the Turbine Driven AFW Pump in service. The SRO will evaluate Technical Specifications.

When the crew has evaluated Technical Specifications, a loss of the running Centrifugal Charging Pump will occur. The crew will enter ABN-105, Chemical and Volume Control System Malfunction and perform actions as required. The SRO will evaluate Technical Specifications.

The major event begins with a Reactor Coolant Pump seized shaft that requires a manual Reactor trip. When the Reactor is manually tripped a spurious Train B Safety Injection signal will actuate. The crew will enter EOP-0.0A, Reactor Trip or Safety Injection and perform immediate actions including actuation of both Trains of Safety Injection. When it is determined that a spurious actuation has occurred the crew will transition to EOS-1.1A, Safety Injection Termination. During the event a Component Cooling Water Pump will fail to start and require actions on the part of the BOP during Attachment 2 of EOP-0.0A.

When the high head injection alignment is secured in EOS-1.1A, a small break LOCA will occur and require re-initiation of Safety Injection flow per the Foldout Page Criteria of EOS-1.1A.

Event termination will occur when the crew has reinitiated Safety Injection and transitioned to EOP-1.0A, Loss of Reactor or Secondary Coolant.

Risk Significance:

- Failure of risk important system prior to trip: Auxiliary Feedwater Pump trip
Centrifugal Charging Pump trip
- Risk significant core damage sequence: SBLOCA following safety injection termination
- Risk significant operator actions: Restore AFW flow
Reinitiate Safety Injection

CPSES
2007 Facility NRC Initial License Examination
Simulator Scenario Setup
Scenario 3

BOOTH OPERATOR'S INSTRUCTIONS

SETUP

IC: Use IC #39 and see attached Event File for NRC Scenario #3.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
1		N/A	Rod withdrawal and power increase to ~2%.		
2		FW24A	MD Auxiliary Feedwater Pump (1-01) trip.		K1
3		CV01B	Charging Pump (1-01) trip.		K2
4		RC15C	Reactor Coolant Pump (1-03) seized shaft.		K3
5		RP14B	Spurious Train B Safety Injection actuation.		Reactor Trip
6		CC02D	Component Cooling Water Pump (1-02) fails to start.		K0
7		RC17C	Loss of Coolant Accident.	1700 gpm	K4

Op Test No.: NRC	Scenario # 3	Event # 1	Page 4 of 18
Event Description:	Power Ascension to ~2%		

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**EXECUTE IC #39 and NRC Scenario #3 SETUP file.** **ENSURE all Simulator Annunciator Alarms are ACTIVE.** **ENSURE Control Rod Bank D @ 176 steps.** **ENSURE Reactor Makeup System is in MANUAL.** **ENSURE Operator Aid Tags reflect current plant conditions.** **ENSURE Computer next to Turbine DCS is booted.** **ENSURE procedures in progress are on the RO desk:** **- Copy of procedure IPO-002A, Plant Startup from Hot Standby, Section 5.4, Increasing Reactor power to ~2%.** **SET Plant Computer screen for BOP to GTGC SGNRLVL.**
Control Room Annunciators in Alarm at 1x10^{-8}amps: **PCIP-1.1 – SR TRN A RX TRIP BLK** **PCIP-1.3 – AMSAC BLK TURB <40% PWR C-20** **PCIP-1.4 – CNDNSR AVAIL STM DUMP ARMED C-9** **PCIP-1.7 – RX ≤ 50% PWR TURB TRIP PERM P-9** **PCIP-2.1 – SR TRN B RX TRIP BLK** **PCIP-2.4 – LO TURB PWR ROD WTHDRW BLK C-5** **PCIP-2.5 – SR RX TRIP BLK PERM P-6** **PCIP-3.5 – RX & TURB ≤ 10% PWR P-7** **PCIP-4.5 – RX ≤ 48% PWR 3-LOOP FLO PERM P-8** **PCIP-4.6 – TURB ≤ 10% PWR P-13** **6A-3.6 – VCT LVL CTRL VLV 112A NOT IN VCT** **6D-1.1 – SR HI VOLT FAIL** **6D-3.1 – SR SHTDN FLUX ALM BLK** **6D-3.9 – ANY TURB TRIP FLUID PRESS LO** **8A-1.3 – FWPT B TRIP** **8A-1.10 – 1 OF 4 TURB STOP VLV CLOSE** **9B-3.8 – TURB TRIP** **10A-3-11 – GEN GAS SYS TRBL** **Numerous 8A & 9A Feedwater alarms**		
Booth Operator:		**When directed, PLACE simulator in RUN to support Shift Turnover.**
+1 min	US	DIRECT performance of IPO-002A, Plant Startup from Hot Standby.

Op Test No.: NRC	Scenario # 3	Event # 1	Page 5 of 18
Event Description:	Power Ascension to ~2%		

Time	Position	Applicant's Actions or Behavior
	RO	ESTABLISH a startup rate of ~ 0.5 dpm to increase Reactor power to ~ 2%.
	RO	Gradually REDUCE startup rate to ~0.2 dpm as the Intermediate Range channels approach $3x10^{-6}$ amps.
	RO	VERIFY Power Range channels begin to respond when the Intermediate Range Channels are between $3x10^{-6}$ amps and $5x10^{-6}$ amps.
	BOP	VERIFY Steam Dump operations maintain RCS temperature at 557ºF and Main Steam pressure at 1092 psig.
	RO	VERIFY annunciator alarm PCIP-3.6, TAVE LO LO P-12 is OFF.
	RO	MAINTAIN Reactor power between 2% and 3%.
	BOP	ADJUST Auxiliary Feedwater flow as necessary to maintain SG levels between 60% and 75%.
+20 min	US	NOTIFY Generation Controller of the Reactor startup and the estimated time for synchronization.
When power has been raised to ~2%, or at Lead Evaluator's discretion, PROCEED to Event 2.		

Op Test No.: NRC	Scenario # 3	Event # 2	Page 6 of 18
Event Description:	Auxiliary Feedwater Pump Trip		

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE FW24A, MDAFW Pump 1-01 trip.**
Indications available: **8B-4.3 – MD AFWP 1/2 OVRLOAD/TRIP**		
+1 min	BOP	RESPOND to Annunciator Alarms.
	BOP	RECOGNIZE Motor Driven Auxiliary Feedwater Pump 1-01 trip.
	US	DIRECT implementation of ABN-305, Auxiliary Feedwater System Malfunction, Section 3.0.
	BOP	DETERMINE one MDAFW Pump running.
	BOP	DETERMINE Steam Generator Levels trending down and START the TDAFW Pump.
	BOP	DISPATCH a Plant Equipment Operator to check breaker status of Auxiliary Feedwater Pump 1-01.
		• P1EA1/5/BKR, 1APMD1, Auxiliary Feedwater Pump 1-01 BKR (SFGD 810 Room 1-83)
Booth Operator:		**When contacted about the condition of the AFW Pump breaker, REPORT an acrid smell and overcurrent flag on Phase B 50/51 relays.**
	BOP	VERIFY MDAFW Pump suction pressure ≥ 10 psig.
	BOP	DISPATCH a Plant Equipment Operator to check the Auxiliary Feedwater Pump 1-01.

Op Test No.:	NRC	Scenario #	3	Event #	2	Page	7	of	18
Event Description:	Auxiliary Feedwater Pump Trip								

Time	Position	Applicant's Actions or Behavior
+10 min	US	EVALUATE Technical Specifications.
		• LCO 3.7.5.B, Auxiliary Feedwater System is applicable (72 hour ACTION).
		• With one AFW train inoperable, restore AFW train to OPERABLE status.
When the Technical Specification actions are addressed, or at Lead Evaluator's discretion, PROCEED to Event 3.		

Op Test No.: NRC	Scenario # 3	Event # 3	Page 8 of 18
Event Description:	Centrifugal Charging Pump Trip		

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE CV01A, Centrifugal Charging Pump 1-01 trip.**
Indications available: **5A-1.6 – ANY RCP SEAL WTR INJ FLO LO** **5A-4.2 – ANY RCP SEAL 1 LKOFF FLO LO** **6A-1.4 – REGEN HX LTDN OUT TEMP HI** **6A-1.7 – ANY CHG PMP OVERLOAD / TRIP** **6A-3.4 – CHG FLO HI / LO** **6A-3.6 – VCT LVL CTRL VLV 112A NOT IN VCT**		
+1 min	RO	RESPOND to Annunciator Alarms.
	RO	RECOGNIZE Charging Pump 1-01 trip.
NOTE:		**The next step is an Initial Operator Action.**
	RO	START Centrifugal Charging Pump 1-02.
	US	DIRECT implementation of ABN-105, CVCS Malfunction, Section 3.0.
	RO	VERIFY one Centrifugal Charging Pump running.
	RO	VERIFY Seal Injection Flow to each RCP between 6 gpm AND 13 gpm.
	RO	VERIFY RCP parameters in normal operating range.
	RO	VERIFY PRZR level > 17% and rising.
	RO	If required, ESTABLISH Letdown flow.

Op Test No.:	NRC	Scenario #	3	Event #	3	Page	9	of	18
Event Description:	Centrifugal Charging Pump Trip								

Time	Position	Applicant's Actions or Behavior
	RO	VERIFY RCS leakage normal.
		• PRZR level stable at or trending to program.
		• Charging flow < 15 gpm above Letdown flow.
+10 min	US	EVALUATE Technical Specifications.
		• LCO 3.5.2.A, ECCS - Operating is applicable (7 day ACTION).
		• One Train inoperable because of the inoperability of a centrifugal charging pump, restore pump to OPERABLE status.
When the Technical Specification actions are addressed, or at Lead Evaluator's discretion, PROCEED to Event 4.		

Op Test No.:	NRC	Scenario #	3	Event #	4	Page	10	of 18
Event Description:	Reactor Coolant Pump Seized Shaft							

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE RC15C, Reactor Coolant Pump #3 seized shaft.**
Indications available: **5A-3.3 – RC LOOP 3 1 OF 3 FLO LO** **5B-1.1 – ANY RCP TRIP** **5B-1.2 – 1 OF 4 RCP UNDRVOLT**		
+30 sec	RO	RESPOND to Annunciator Alarms.
	RO	RECOGNIZE Reactor Coolant Pump 1-03 trip.
CRITICAL TASK	RO/BOP	DETERMINE Reactor is not tripped and manually TRIP Reactor.
	US	TRANSITION to EOP-0.0A, Reactor Trip or Safety Injection.
When the RCP trip actions are addressed, or at Lead Evaluator's discretion, PROCEED to Events 5, 6, and 7.		

Op Test No.: NRC	Scenario # 3	Event # 5, 6 and 7	Page 11 of 18
Event Description:	Spurious Train B Safety Injection / CCW Pump Start Failure / Small Break LOCA		

Time	Position	Applicant's Actions or Behavior
Booth Operator:		**When directed, EXECUTE RP14B, Spurious Train B Safety Injection and RC17C.**
Indications available: **6C-1.1 – MAN RX TRIP**		
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
	RO	VERIFY Reactor Trip:
		• Reactor trip breakers – OPEN
		• Neutron flux - DECREASING
	RO	VERIFY ALL control rod position rod bottom lights – ON.
	BOP	VERIFY Turbine Trip:
		• All HP turbine stop valves – CLOSED.
	BOP	VERIFY Power to AC Safeguards Busses:
		• AC safeguards busses – BOTH ENERGIZED.
	RO	CHECK if SI is Actuated:
		• DETERMINE SI is actuated on Train B.
		• Manually ACTUATE SI on Train A.
	RO	DETERMINE both Trains of SI actuated.
NOTE:		**EOP-0.0A, Attachment 2 steps performed by the BOP are identified later in the scenario.**

Op Test No.: NRC	Scenario # 3	Event # 5, 6 and 7	Page 12 of 18
Event Description:	Spurious Train B Safety Injection / CCW Pump Start Failure / Small Break LOCA		

Time	Position	Applicant's Actions or Behavior
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2.
	RO	VERIFY AFW Alignment:
		• MDAFW Pumps – RUNNING
		• Turbine Driven AFW Pump – RUNNING
		• AFW total flow – GREATER THAN 460 GPM
		• AFW valve alignment - PROPER ALIGNMENT
	RO	VERIFY Containment Spray Not Required:
		• DETERMINE Containment pressure remained < 18.0 PSIG
		• Containment Pressure < 18.0 PSIG
		• VERIFY containment spray heat exchanger out valves – CLOSED.
		• VERIFY containment spray pumps – RUNNING.
	RO	DETERMINE Main Steam lines should NOT be Isolated:
		• VERIFY the following:
		• Containment pressure < 6.0 PSIG
		• Steam line pressure > 610 PSIG
	RO	CHECK RCS Temperature -
		• RCS average temperature stable at or trending to 557°F.
	RO	CHECK PRZR Valve Status:
		• PRZR Safeties – CLOSED
		• NORMAL PRZR spray valves – CLOSED.
		• PORVs - CLOSED
		• Power to at least one block valve – AVAILABLE
		• Block valves – AT LEAST ONE OPEN

Op Test No.: NRC	Scenario # 3	Event # 5, 6 and 7	Page 13 of 18
Event Description:	Spurious Train B Safety Injection / CCW Pump Start Failure / Small Break LOCA		

Time	Position	Applicant's Actions or Behavior
	RO	DETERMINE RCPs Should NOT Be Stopped:
		• ECCS pumps – AT LEAST ONE RUNNING
		• CCP and SI pump
		• RCS subcooling > 25°F.
	US	CHECK if Any SG Is Faulted:
		• DETERMINE pressure in all SGs – NORMAL
	US	CHECK if SG Tubes are Not Ruptured:
		• DETERMINE no SG tubes ruptured
	RO	DETERMINE RCS Is Intact.
		• Containment pressure < 1.3 PSIG
		• Containment recirculation sump levels – NORMAL
		• Containment radiation – NORMAL (GRID 4)
	RO	DETERMINE If ECCS Flow Should Be Reduced:
		• VERIFY Secondary heat sink:
		• Narrow range level in at least one SG > 10%
		• Total AFW flow to SGs > 460 GPM
		• RCS subcooling > 25°F
		• RCS pressure – STABLE OR INCREASING
		• PRZR LEVEL > 13%
	US	TRANSITION to EOS-1.1A, Safety Injection Termination, Step 1.
NOTE:	**These steps are performed by the BOP as required per EOP-0.0A, Attachment 2. EOS-1.1A steps are identified later in the scenario.**	

Op Test No.: NRC	Scenario # 3	Event # 5, 6 and 7	Page 14 of 18
Event Description:	Spurious Train B Safety Injection / CCW Pump Start Failure / Small Break LOCA		

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY SSW Alignment:
		• VERIFY SSW Pumps RUNNING.
		• VERIFY diesel generator cooler SSW return flow.
	BOP	VERIFY Safety Injection Pumps – RUNNING.
	BOP	VERIFY Containment Isolation Phase A.
	BOP	VERIFY Containment Ventilation Isolation.
	BOP	DETERMINE both CCW Pumps NOT RUNNING.
	BOP	Manually START CCW Pump (1-02).
	BOP	VERIFY RHR Pumps – RUNNING
	BOP	VERIFY Proper CVCS Alignment:
		• VERIFY CCPs – RUNNING
		• VERIFY Letdown Relief Valve isolation:
		• Letdown orifice isolation valves – CLOSED.
		• Letdown isolation valves – CLOSED.
		• 1/1-LCV-459 and 1/1-LCV-460
	BOP	VERIFY ECCS flow:
		• VERIFY CCP SI flow indicator.
		• VERIFY RCS pressure > 1800 PSIG.
		• VERIFY RCS pressure > 425 PSIG.
	BOP	VERIFY Feedwater Isolation Complete:

Op Test No.: NRC	Scenario # 3	Event # 5, 6 and 7	Page 15 of 18
Event Description:	Spurious Train B Safety Injection / CCW Pump Start Failure / Small Break LOCA		

Time	Position	Applicant's Actions or Behavior
		• VERIFY feedwater isolation valves CLOSED.
		• VERIFY feedwater isolation bypass valves CLOSED.
		• VERIFY feedwater preheater bypass valves CLOSED.
		• VERIFY feedwater bypass control valves CLOSED.
		• VERIFY feedwater control valves CLOSED.
		• VERIFY feedwater split flow bypass valves CLOSED.
	BOP	VERIFY Diesel Generators – RUNNING.
	BOP	VERIFY Monitor Lights For SI Load Shedding illuminated.
	BOP	VERIFY Proper SI alignment per MLB light indication.
	BOP	VERIFY Safety Injection components alignment per Table 1.
NOTE:	**EOS-1.1A, Safety Injection Termination steps begin here.**	
	BOP	If diesels are RUNNING, PLACE Both DG EMER STOP/START Handswitches In START.
	BOP	RESET SI.
	BOP	RESET SI Sequencers.
	BOP	RESET Containment Isolation Phase A and Phase B.
	BOP	RESET Containment Spray Signal.
	BOP/RO	ESTABLISH instrument Air And Nitrogen To Containment.

Op Test No.: NRC	Scenario # 3	Event # 5, 6 and 7	Page 16 of 18
Event Description:	Spurious Train B Safety Injection / CCW Pump Start Failure / Small Break LOCA		

Time	Position	Applicant's Actions or Behavior
	RO	STOP All But One CCP and PLACE In Standby.
	US/RO	CHECK RCS Pressure – STABLE OR INCREASING.
CRITICAL TASK	RO	ISOLATE CCP Injection Line Flow Path:
		• CHECK CCP – SUCTION ALIGNED TO RWST.
		• ALIGN CCP miniflow valves:
		• OPEN CCP miniflow valves, 1/1-8110 and 1/1-8111.
		• CLOSE CCP alternate miniflow isolation valves, 1/1-8511A and 1/1-8511B.
		• PLACE charging flow control valve in MANUAL and 35% demand.
		• CLOSE the CCP injection line isolation valves:
		• 1/1-8801A and 1/1-8801B
	RO	ESTABLISH Charging Flow Path:
		• OPEN charging line isolation valves, 1/1-8105 and 1/1-8106.
		• ADJUST charging flow control valve to establish charging flow.
		• ADJUST RCP seal flow to RCPs to maintain between 6 gpm and 13 gpm.
	RO	CONTROL Charging Flow to Maintain PRZR Level.
	RO	CHECK If SI Pumps Should Be Stopped:
		• CHECK RCS pressure:
		• Pressure – STABLE OR INCREASING.
		• Pressure > 1700 PSIG.
		• STOP SI pumps and PLACE in standby.

Op Test No.: NRC	Scenario # 3	Event # 5, 6 and 7	Page 17 of 18
Event Description:	Spurious Train B Safety Injection / CCW Pump Start Failure / Small Break LOCA		

Time	Position	Applicant's Actions or Behavior
	RO	CHECK If RHR Pumps Should Be Stopped:
		• RHR pumps RUNNING with suction aligned to RWST
		• STOP RHR pumps and place in standby.
		• RESET RHR auto switchover.
B. O. CUE:	**When the high head injection valves and SI Pumps have been secured <u>or</u> if a transition to EOS-1.2A, Post LOCA Cooldown and Depressurization is announced (crew decides that RCS is not stable or increasing), EXECUTE RC17C, SBLOCA @1700 gpm.**	
NOTE:	**Crew may transition to EOS-1.2A, Post LOCA Cooldown and Depressurization (per Step 12 of EOS-1.1A) if it is determined that PRZR pressure is not stable on increasing.**	
+20 min	US/RO	RECOGNIZE PZR level and subcooling lowering and TRANSITION to EOP-1.0.A, Loss of Reactor or Secondary Coolant.
NOTE:	**Crew may choose to start ECCS Pumps, open high head injection valves or initiate Safety Injection. Any of these actions meets the CPSES EOP Guidelines.**	
CRITICAL TASK	RO	START ECCS Pumps **and/or** REALIGN high head injection **and/or** INITIATE Safety Injection.
NOTE:	**EOP-1.0A, Loss of Reactor or Secondary Coolant steps begin here.**	
	RO	DETERMINE RCPs Should Be Stopped:
		• ECCS pumps – AT LEAST ONE RUNNING
		• CCP and SI pump
		• RCS subcooling < 25°F.
		• STOP all RCPs.

Op Test No.:	NRC	Scenario #	3	Event #	5, 6 and 7	Page	18	of 18
Event Description:	Spurious Train B Safety Injection / CCW Pump Start Failure / Small Break LOCA							

Time	Position	Applicant's Actions or Behavior
	RO	DETERMINE that no SG is faulted.
	BOP	CHECK Intact SG levels:
		• Narrow range level > 10%.
		• CONTROL AFW flow to maintain narrow range level between 10% and 50%.
	RO/BOP	CHECK Secondary Radiation – NORMAL.
	RO	CHECK PRZR PORVs And Block Valves available.
	US	DETERMINE ECCS Flow Should NOT Be Reduced.
When high head Safety Injection flow is restored, TERMINATE the scenario.		

UNIT: 1

UNIT SUPERVISOR RELIEF CHECKLIST (NRC Scenario #3)

PART I TO BE PREPARED BY THE OFF-GOING UNIT SUPERVISOR.

1.0 SHIFT ACTIVITIES:

1.1 **Activities Completed This Shift:**

1.2 **Activities In-Progress:** **Plant startup per IPO-002A, Plant Startup from Hot Standby.**

1.3 **Planned Activities:** **Raise Reactor power using control rods to ~2% power.**
Place Main Feedwater Pump in service when power level is stabilized and all MODE 1 LCOs are met.

2.0 PLANT AND EQUIPMENT STATUS:

2.1 Technical Specification Related Equipment Summary:
None

2.2 Non-Technical Specification Equipment Summary:
None

3.0 GENERAL INFORMATION:
Raise Reactor power using control rods to ~2% power per IPO-002A, Plant Startup from Hot Standby.

4.0 END OF SHIFT REVIEW:

LOGS – RO/BOP	X	LOGS-PEO	X	CLOSED eLCOARs ARCHIVED	X
OPTS COMPLETED	X	DAILY ACTIVITIES LIST	X	LCOARs REVIEWED	X

PART II TO BE COMPLETED BY THE ON-COMING UNIT SUPERVISOR.

1.0 CRITICAL PARAMETERS:

MODE:	2	REACTOR POWER:	$1x10^{-8}$	MWE:	0
RCS TAVE:	557 °F	CONTROL ROD POSITION	176	ON BANK	D
C_b:	1806 ppm	RCS PRESS:	2235 psig		

[X] Protected Train – Train A
[X] Risk Assessment GREEN
[X] Unit 2 is in Mode 1 @ 100% power
[X] BAT C_B = 7447 ppm