Catawba Nuclear Station
RO JPM A.1-1
Sep. 2013 NRC Exam

JPM A.1-1

RO

Catawba Nuclear Station
RO JPM A.1-1
Sep. 2013 NRC Exam

DATA SHEET

Task: Calculate RHT and BAT Addition to the FWST

Alternate Path: N/A

Facility JPM #: New

Safety Function: N/A

K/A G2.1.20 Ability to interpret and execute procedure steps.

Importance: 4.6 / 4.6 **CFR:** 41.10 / 43.5 / 45.12

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator _____ Classroom X Perform X Simulate _____

References: OP/2/A/6200/014 (Refueling Water System) revision 077

Task Standard: Applicant determines:
1) RHT volume added = 5153 gallons (5150 – 5262)
2) BAT volume added = 2747 gallons (2738 – 2750)

Validation Time: 15 minutes **Time Critical:** Yes _____ No X

Applicant:
NAME_____ Docket #_____

Time Start: _____
Time Finish: _____

Performance Rating:

Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

- **Unit 2 is in Mode 5**
- **FWST 1% = 3,950 gals**
- **BAT = 7500 ppmB**
- **RHT = 1038 ppmB**
- **FWST is currently 97% at 2790 ppmB**

INITIATING CUES:

The CRS has directed you to determine the amount of BAT addition and RHT addition necessary to raise FWST level to 99% and 2800 ppmB per OP/2/A/6200/014 (Refueling Water System), Enclosure 4.9 (FWST Makeup From RHT) steps 3.5 and 3.6.

CV has been waived for this JPM.

Amount of BAT addition - _____ gallons

Amount of RHT addition - _____ gallons

EXAMINER NOTE: Provide the applicant a copy of OP/2/A/6200/014 Enclosure 4.9 completed through step 3.4.

STEP / STANDARD	SAT / UNSAT

START TIME: _____

3.5 Determine the required boron concentration ($C_{m/u}$) of the makeup to raise the FWST to the desired level as follows: **NOTE:** Final FWST level and boron concentration shall comply with COLR requirements. STEP 1: 3.5.1 Record the following: □ desired final FWST boron concentration (C_{FWST}) _____ ppm □ desired final FWST volume (V_{FWST}) _____ gallons □ initial FWST boron concentration (C_i) _____ ppm □ initial FWST volume (V_i) _____ gallons □ makeup volume ($V_{m/u}$) = (V_{FWST}) - (V_i) = ( ) - ( ) =____ gallons STANDARD: Applicant determines : C_{FWST} = 2800 ppm (from initiating cue) V_{FWST} = 391,050 gallons (calculated from init cue and init conditions) C_i = 2790 ppm (from initial conditions) V_i = 383,150 gallons (calculated from initial conditions) $V_{m/u}$ = 7900 gallons **EXAMINER NOTE: The applicant may decide to round down the volumes of the FWST, in which case V_{FWST} = 391,000 gallons, V_i = 383,000 gallons, and $V_{m/u}$ = 8000 gallons.** **This step is critical to calculate total makeup volume.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 2: 3.5.2 Calculate $C_{m/u}$ as follows: $C_{m/u} = \frac{C_{FWST}V_{FWST} - C_i V_i}{V_{m/u}}$ $C_{m/u} = \frac{(\quad)(\quad) - (\quad)(\quad)}{(\quad)}$ $C_{m/u}$ = _____ ppm STANDARD: Applicant calculates $C_{m/u}$ to be 3285 ppm. **EXAMINER NOTE: If the applicant used rounding for the FWST volume in the previous step, then $C_{m/u}$ will be 3278 ppm.** **This step is critical to calculate required ppm to raise FWST boron concentration to the desired value.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___UNSAT**

STEP / STANDARD	SAT / UNSAT
3.6 Determine the amount of boric acid ($V_{b/a}$) and RHT contents (V_{RHT}) that must be added to the FWST to achieve the desired final FWST concentration as follows: STEP 3: 3.6.1 Record the following: □ makeup volume from Step 3.5.1 ($V_{m/u}$) _____ gallons □ makeup boron concentration from Step 3.5.2 ($C_{m/u}$) _____ ppm □ current RHT boron concentration (C_{RHT}) _____ ppm □ current BAT boron concentration ($C_{b/a}$) _____ ppm STANDARD: Applicant records: $V_{m/u}$ = 7900 gallons (from step 3.5.1) $C_{m/u}$ = 3285 ppm (from step 3.5.2) C_{RHT} = 1038 ppm (from the initiating cues) $C_{b/a}$ = 7500 ppm (from the initiating cues) **EXAMINER NOTE: If the applicant used rounding in step 3.5.1, the $V_{m/u}$ will be 8000 gallons and $C_{m/u}$ will be 3278 ppm.** COMMENTS:	**___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 4: 3.6.2 Calculate $V_{b/a}$ as follows: $V_{b/a} = \frac{V_{m/u}\,(C_{m/u} - C_{RHT})}{C_{b/a} - C_{RHT}}$ $V_{b/a} = \frac{(\quad)(\quad - \quad)}{(\quad - \quad)}$ $V_{b/a}$ = _____ gallons STANDARD: Applicant calculates $V_{b/a}$ to be 2,747 gallons. **EXAMINER NOTE: If the applicant used rounding in step 3.5.1, then $V_{b/a}$ will be 2,773 gallons.** **EXAMINER NOTE: The applicant may decide to round up and record 2,750 gallons for conservatism.** **This step is critical to determine the amount of boric acid addition required to achieve the desired final boron concentration and level.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 5: 3.6.3 Calculate V_{RHT} as follows: $V_{RHT} = V_{m/u} - V_{b/a}$ = ( ) - ( ) = _____ gallons STANDARD: Applicant calculates V_{RHT} to be 5,153 gallons. **EXAMINER NOTE: If the applicant used rounding in step 3.5.1, then V_{RHT} will be 5,227 gallons.** **EXAMINER NOTE: If the applicant used rounding in step 3.6.2, then V_{RHT} will be 5,150 gallons.** **This step is critical to determine the amount of water addition from the RHT that will be required to achieve the desired final boron concentration and level.** COMMENTS: **END OF TASK**	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

- **Unit 2 is in Mode 5**
- **FWST 1% = 3,950 gals**
- **BAT = 7500 ppmB**
- **RHT = 1038 ppmB**
- **FWST is currently 97% at 2790 ppmB**

INITIATING CUES:

The CRS has directed you to determine the amount of BAT addition and RHT addition necessary to raise FWST level to 99% and 2800 ppmB per OP/2/A/6200/014 (Refueling Water System), Enclosure 4.9 (FWST Makeup From RHT) steps 3.5 and 3.6.

CV has been waived for this JPM.

Amount of BAT addition - _____ gallons

Amount of RHT addition - _____ gallons

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JPM A.1-2

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DATA SHEET

Task: Calculate Unit Vent flow manually per PT/1/A/4450/017 (Unit Vent Flow Manual Calculation).

Alternate Path: N/A

Facility JPM #: WG-002

Safety Function: N/A

K/A G2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Importance: 4.3 / 4.4 **CFR:** 41.10 / 43.5 / 45.2 / 45.6

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator ___X___ In-Plant _____ Perform ___X___ Simulate _____

References: PT/1/A/4450/017 (Unit Vent Flow Manual Calculation) Rev 013
SLC 16.11-7 (Radioactive Gaseous Effluent Monitoring Instrumentation)

Task Standard: Unit Vent flow is calculated to be 117450 scfm +/- 1000.

Validation Time: 15 minutes **Time Critical:** Yes _____ No ___X___

Applicant: Time Start: _____
NAME_____ Docket #_____ Time Finish: _____

Performance Rating: Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC #168**
3. **Enter the password.**
4. **Select "Yes" on the INITIAL CONDITION RESET pop-up window.**
5. **Ensure simulator setup per table below.**
6. **Place simulator in RUN and acknowledge any alarms.**
7. **ENSURE "Extra Operator" is present in the simulator.**
8. **Place simulator in FREEZE until Examiner cue is given.**
9. **May need a footstool for applicants to access and read VA system flow indicator.**

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	XMT-VA001 (FVA_5280 ABFXU-1 AIR FLOW MTR)	56000				
	XMT-VA002 (FVF_5310 OUTLET AIRFLOW TRN A MTR)	0				
Place OOS sticker on 1VFP5310 (VF OTLT AIR FLOW TRN A)						

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INITIAL CONDITIONS:

- Both Units are at 100% power.
- No VQ release is in progress.
- No GWRs are in progress.
- The Waste Evaporator and Recycle Evaporator are secured.
- The Unit Vent Stack Flow Rate Meter is INOPERABLE.
- Auxiliary Building NLO has called the control room to report 1ABUXF Discharge Air Flow (1ABUX-AFMD-1) is reading 27000 scfm.

INITIATING CUES:

Calculate Unit Vent flow per PT/1/A/4450/017 (Unit Vent Flow Manual Calculation) Enclosure 13.1.

EXAMINER NOTE:

When applicant locates PT/1/A/4450/017, hand out a copy of the PT, Enclosure 13.1.

STEP / STANDARD	SAT / UNSAT

START TIME: _____

STEP 1: Applicant locates and records VA (Auxiliary Building Ventilation) System flow. STANDARD: Applicant locates 1VAP5280 on 1MC-3 and records **56,000 scfm.** **EXAMINER NOTE: May provide a picture of the control board gauge instead of locating in the simulator.** **EXAMINER NOTE: Range of 55000 to 57000 scfm is acceptable.** **This step is critical to obtain VA (Auxiliary Building Ventilation) flow required to complete the calculation.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 2: Applicant locates and records VE (Annulus Ventilation) 1A flow to stack. STANDARD: Applicant locates 1VEP5180, notes VE (Annulus Ventilation) train 1A is shutdown and records **0 scfm.** **EXAMINER NOTE: May provide a picture of the control board gauge instead of locating in the simulator.** COMMENTS:	**___ SAT** **___UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 3: Applicant locates and records VE (Annulus Ventilation) 1B flow to stack. STANDARD: Applicant locates 1VEP5200, notes VE (Annulus Ventilation) train 1B is shutdown and records **0 scfm.** **EXAMINER NOTE: May provide a picture of the control board gauge instead of locating in the simulator.** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 4: Applicant locates and records VF (Fuel Pool Ventilation) 1A flow to stack. STANDARD: Applicant locates 1VFP5310, notes VF (Fuel Pool Ventilation) reading is OOS and uses **33130 scfm** from enclosure 13.2. **EXAMINER NOTE: May provide a picture of the control board gauge instead of locating in the simulator.** **This step is critical to ensure the correct value is included in the calculation.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 5: Applicant locates and records VF (Fuel Pool Ventilation) 1B flow to stack. STANDARD: Applicant locates 1VFP5340, notes VF (Fuel Pool Ventilation) train 1B is shutdown and records **0 scfm.** **EXAMINER NOTE: May provide a picture of the control board gauge instead of locating in the simulator.** COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 6: Applicant records 1ABUX-AFMD-1 flow. STANDARD: Applicant records **27000 scfm** based on initial cue. **This step is critical to ensure the value is added to the calculation.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 7: Applicant records VP (Containment Purge) flows. STANDARD: Based on initial cues VP (Containment Purge) is secured. Applicant records flow as **0 scfm or N/A.** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 8: Applicant records WG (Waste Gas) flow and VQ (Containment Air Release and Addition) flow. STANDARD: Based on initial cues, applicant records flow as **0 scfm or N/A** COMMENTS:	___ SAT ___ UNSAT
STEP 9: Applicant records TL (Main Turbine Seals) flow STANDARD: Based on initial cue and procedure notes, applicant records **1260 scfm**. **This step is critical to ensure TL (Main Turbine Seals) flow is added to the calculation.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 10: Applicant records NB (Reactor Makeup) and WL (Liquid Waste) flows. STANDARD: Based on initial cues, applicant records flow as **0 scfm or N/A.** COMMENTS:	___ SAT ___ UNSAT

STEP / STANDARD	SAT / UNSAT
STEP 11: Applicant records ZJ (Condensate Steam Air Ejectors) flow to stack. STANDARD: Based on initial cue and procedure notes, applicant records **60 scfm**. **This step is critical to ensure ZJ (Condensate Steam Air Ejectors) flow is added to the calculation.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 12: Calculate total vent flow. STANDARD: Applicant calculates total vent flow to stack as **117450 scfm.** **EXAMINER NOTE: Due to reading instruments, 116450 -118450 scfm is considered acceptable.** **This step is critical to calculate total vent flow.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 13: Complete the PT. STANDARD: Applicant records that acceptance criteria is met and signs off remaining procedure steps. **EXAMINER NOTE: Applicant may create a Discrepancy Sheet based on gauge VFP5310 having an OOS sticker on it. Although not required, it is not incorrect to submit one.** **This step is critical to verify that acceptance criteria is met.** COMMENTS: **END OF TASK**	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

READ TO APPLICANT

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INITIAL CONDITIONS:

- Both Units are at 100% power.
- No VQ release is in progress.
- No GWRs are in progress.
- The Waste Evaporator and Recycle Evaporator are secured.
- The Unit Vent Stack Flow Rate Meter is INOPERABLE.
- Auxiliary Building NLO has called the control room to report 1ABUXF Discharge Air Flow (1ABUX-AFMD-1) is reading 27000 scfm.

INITIATING CUES:

Calculate Unit Vent flow per PT/1/A/4450/017 (Unit Vent Flow Manual Calculation) Enclosure 13.1.

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JPM A.2

RO-SRO

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DATA SHEET

Task: Classify a D/G Start and Complete a Logbook Entry

Alternate Path: N/A

Facility JPM #: DG3-010

Safety Function: N/A

K/A 2.2.12 Knowledge of surveillance procedures.

Importance: 3.7 / 4.1 **CFR:** 41.10 / 45.13

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator _____ Classroom __X__ Perform __X__ Simulate _____

References: OMP 2-28 (Diesel Generator Logbook) rev 026
PT/2/A/4350/002 B, (Diesel Generator 2B Operability Test), Rev. 101

Task Standard: Classify the D/G start as a VALID FAILURE and correctly enter data into the logbook.

Validation Time: 14 minutes **Time Critical:** Yes _____ No __X__

Applicant:
NAME_____ Docket #_____

Time Start: _____
Time Finish: _____

Performance Rating:

Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

- Unit 2 is in Mode 1.
- You were an extra operator on shift and assisting the Operation Test Group in a scheduled surveillance test of the 2B Emergency Diesel Generator.
- The test was conducted using procedure PT/2/A/4350/002B (D/G Operability Test).
- Prior to completing the scheduled surveillance test, the 2B D/G tripped due to a malfunction of the low-low lube oil pressure switch at 0905.
- PT/2/A/4350/002B has been completed up to step 12.75 for completing Diesel Generator Logbook entries per OMP 2-28.

INITIATING CUES:

Using the information provided in Initial Conditions, classify the test and fill in all available Diesel Generator Logbook data on Attachments 10.1 and 10.2 of OMP 2-28 and submit to the CRS for review.

EXAMINER NOTE:

The applicant may ask for a name for the MCE Rotating Equipment Supervisor and a PIP # when completing the logbook entries. If necessary, this may be done in another room to prevent the possible compromise of the exam.

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STEP / STANDARD	SAT / UNSAT

START TIME: _____

STEP 1: Based on initial conditions, applicant refers to OMP Section 6 to determine the TEST CLASSIFICATION. STANDARD: Applicant determines that the test is a VALID FAILURE based on criteria 6.4.A. **EXAMINER NOTE: When student is ready to fill out the logbook provide a blank copy of Enclosure 10.1 and a filled out copy of Enclosure 10.2 as provided.** **This step is critical to determine the correct classification.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 2: Applicant enters appropriate information on Attachment 10.1 using information from the initial conditions. STANDARD: ☐ **Enters 2B D/G.** ☐ Enters their name. ☐ **Enters start attempt based on last entry on 8/2 (2013-8).** ☐ Enters today's date. ☐ Marks PT/1(2)/4350/002A(B) as procedure used. ☐ Marks SCHEDULED SURVEILLANCE as Reason for D/G Operation. ☐ Enters TURBO PRELUBE for type of start. ☐ Enters engine start time 0820. ☐ Enters engine shutdown time 0905. ☐ Enters run time as 0.75 hours. ☐ Calculates total run time as 20.55 hours (19.8+0.75). ☐ **Enters classification (VALID FAILURE).** ☐ **Enters reason D/G start was not a valid success: (2B D/G tripped on a malfunction of the LOLO Lube Oil Pressure switch prior to being loaded > 2875 KW for > 1 hour).** ☐ Marks MCE Rotating Equipment supervisor or designee. **EXAMINER CUE: CRS will contact MCE Rotating Equipment supervisor.** Marks PIP block since a PIP is required for this start. **EXAMINER CUE: PIP # C-13-0001** **The steps in bold are critical because all other entries are required regardless of the classification.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 3: Logs the start into the Index Sheet (Enclosure 10.2) STANDARD: □ **Enters Start # as 2013-8 or - 8.** □ Enters Date as today's date. □ **Enters Test Classification as "VALID FAILURE".** □ Enters run time as 0.75 hrs. □ Enters yearly run time as 20.55 hrs. □ Indicates PIP # will be written in space provided. **The items in bold are critical based on OMP 2-28 section 3 criteria.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

- Unit 2 is in Mode 1.
- You were an extra operator on shift and assisting the Operation Test Group in a scheduled surveillance test of the 2B Emergency Diesel Generator.
- The test was conducted using procedure PT/2/A/4350/002B (D/G Operability Test).
- Prior to completing the scheduled surveillance test, the 2B D/G tripped due to a malfunction of the low-low lube oil pressure switch at 0905.
- PT/2/A/4350/002B has been completed up to step 12.75 for completing Diesel Generator Logbook entries per OMP 2-28.

INITIATING CUES:

Using the information provided in Initial Conditions, classify the test and fill in all available Diesel Generator Logbook data on Attachments 10.1 and 10.2 of OMP 2-28 and submit to the CRS for review.

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JPM A.3

RO - SRO

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DATA SHEET

Task: Calculate Low Pressure Service Water Discharge flow for a liquid radioactive release.

Alternate Path: N/A

Facility JPM #: 2010 NRC Initial License Exam SRO-D Admin.

Safety Function: N/A

K/A 2.3.11 Ability to control radiation releases

Importance: 3.8 / 4.3 **CFR:** 41.11 / 43.4 / 45.10

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator _____ Classroom X Perform X Simulate _____

References: PT/0/A/4250/011 (RL Temperature And Discharge Flow Determination) rev 050

Task Standard: Applicant obtains needed data, correctly calculates total discharge flow, and determines that the liquid waste release can NOT continue.

Validation Time: 15 minutes **Time Critical:** Yes _____ No X

Applicant:
NAME_____ Docket #_____

Time Start: _____
Time Finish: _____

Performance Rating:

Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. **Unit 1 is currently performing a liquid waste release from the Monitor Tank Building.**
2. **Low Pressure Service Water (RL) Flow transmitter 0RLP5080 (RL Disch Flow) and OAC points C1P0903 and C2P0903 (RL Line A Disch Flow-Hourly Average) are INOPERABLE and have been removed from service.**
3. **The RN system is aligned to the RL discharge header.**
4. **PT/0/A/4250/011 (RL Temperature and Discharge Flow Determination) was last completed at 0700.**
5. **Current time is 1030.**
6. **Units 1 and 2 are both at 100% power.**

INITIATING CUES:

You are directed to calculate the total RL discharge flow using Enclosure 13.2 (Total Discharge Flow Calculation Sheet) of PT/0/A/4250/011 and determine if adequate flow exists to continue the release per the LWR currently in progress. Record your answer in the spaces below.

Total RL Discharge Flow _____ GPM.

Adequate Flow Exists _____.
Yes/No

EXAMINER NOTE:

After reading initiating cue, provide applicant with a copy of PT/0/A/4250/011 Enclosures 13.1 signed off up to step to perform Encl. 13.2, Enclosures 13.2 and 13.7, appropriate data sheet, and a copy of the LWR permit report.

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STEP / STANDARD	SAT / UNSAT

START TIME: _____

STEP 1: 1.1.2 Perform the following calculations to obtain Total Discharge Head: RL Disch Pressure = 0RLP5030 + 3.9 psi RL Disch Pressure = __66__ + 3.9 psi = _69.9_ psig Lake Elevation = __569__ 0RNP7380 (Lake Wylie Level) or obtained from hydro central per Step 1.1.4.2 of Enclosure 13.1. (_69.9_ psig x 2.311ft/psig) + (571.75 - _569_ ft) = _164.3_ ft RL Disch Pressure Lake Elev Total Disch Head STANDARD: Applicant calculates RL Discharge pressure. **This step is critical because improper entry affects the calculation for Total RL Discharge Flow.** **EXAMINER NOTE: Step 1.1.1 is N/A because ORLP5030 indicator IS available.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 2: 1.1.3 Using Total Discharge Head from Step 1.1.2 obtain the RL Pump Flow value using one of the following: □ Enclosure 13.7 (RL Pumps Head / Capacity Table) OR □ OAC Databook in "Secondary Systems Databook Calcs" using"RL Total Discharge Head vs. RL Pump Flow Rate". STANDARD: Applicant determines that RL Pump Flow per Enclosure 13.7 is 38,354 GPM. **EXAMINER NOTE:** Range of 37,405 – 39,219 GPM is acceptable. **This step is critical because improper entry affects the calculation for Total RL Discharge Flow.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 3: 1.1.4 Once RL Pump Flow value is obtained, calculate Total RL Supply based on number of RL pumps in operation: 38354 X 1 = 38354 RL Pump Flow # of pumps in op. Total RL Supply (A) STANDARD: Applicant calculates Total RL Supply to be 38,354 GPM. **EXAMINER NOTE:** Range carried forward is 37,405 to 39,219 GPM. **This step is critical because improper entry affects the calculation for Total RL Discharge Flow.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 4: 1.1.5 Enter Total RL supply (A) value in Step 1.4. STANDARD: Applicant enters value calculated for Total RL Supply in blank (A) on page 3 of 3 of Enclosure 13.2. **EXAMINER NOTE:** Steps 1.2.1 and 1.2.2 are not applicable per initiating cue. **This step is critical because improper entry affects the calculation for Total RL Discharge Flow.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 5: 1.2.3 **IF** either C1P5854 (RN Train A Calculated Total Flow) **OR** C1P5855 (RN Train B Calculated Total Flow) is **NOT** available, perform the following to obtain total RN flow: 1.2.3.1 Calculate RN Pump Train A flow: ____0_____ + ____0_____ = _____0____gpm 1RNP7520 + 2RNP7520 = RN Pump Train A flow 1.2.3.2 Calculate RN Pump Train B flow: __17,000__ + ___0____ = __17,000__gpm 1RNP7510 + 2RNP7510 = RN Pump Train B flow STANDARD: Applicant calculates total RN flow to be 17,000 GPM. **This step is critical because improper entry affects the calculation for Total RL Discharge Flow.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 6: 1.2.4 Perform the following calculations to obtain Total RN Flow: _____0_____ + _____17,000_____ = _17,000_gpm (B) RN Pump Train A Flow + RN Pump Train B Flow = Total RN Flow STANDARD: Applicant calculates total RN flow to be 17,000 GPM. **This step is critical because improper entry affects the calculation for Total RL Discharge Flow.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 7: 1.2.5 Enter Total RN Flow (B) in Step 1.4. STANDARD: Applicant enters Total RN Flow calculated in previous step in blank (B) on page 3 of 3. **EXAMINER NOTE:** Steps 1.3.1 and 1.3.2 are not applicable per data sheet. **This step is critical because improper entry affects the calculation for Total RL Discharge Flow.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 8: 1.3.3 Calculate Cooling Tower Total Evaporation as follows: 13,500 (C1P5853) + 14,000 (C2P5853) = 27,500 gpm (C) Total Evaporation STANDARD: Applicant calculates Total Cooling Tower Evaporation to be 27,500 GPM and enters this value in blank (C) of step 1.4. **This step is critical because improper entry affects the calculation for Total RL Discharge Flow.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 9: 1.4 Perform the following calculation to obtain Total RL Disch Flow: 38354 (A) + 17,000 (B) - 27,500 (C) = 27,854 gpm STANDARD: Applicant calculates Total RL discharge flow to be 27,854 GPM. **EXAMINER NOTE:** Calculation range carried forward would be 26,905 to 28,219 GPM. **This step is critical to ensure that enough RL flow exists to dilute the liquid waste release that is in progress.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
NOTE: Due to problems with current RL instrumentation (PIP C-10-4540) and discrepancies between calculated and OAC RL flow (PIP C-12-1399), a safety factor is applied to the Calculated Total RL Disch Flow of Step 1.4 to ensure conservative Total RL Disch Flow rates are used for dilution purposes. This is a temporary conservative action for use till RL discharge flow instrumentation problems are resolved. STEP 10: 1.5 Apply dilution safety factor to obtain Total RL Discharge flow from the Calculated Total RL Discharge Flow from Step 1.4 as follows: (27,854 gpm) X 0.65 = 18,105 gpm STANDARD: Applicant calculates Total RL Discharge flow to be 18,105 GPM. **EXAMINER NOTE:** Calculation range carried forward would be 17,488 to 18,667 GPM. **This step is critical to ensure that enough RL flow exists to dilute the liquid waste release that is in progress.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 11 Determination of adequate RL flow. STANDARD: Applicant determines that Total RL Discharge Flow is LESS than the "Minimum RL Flow interlock setpoint for radionuclides (gpm)" required by and listed on the Liquid Waste Release Permit Report, and that the release may NOT continue. **This step is critical for ensuring termination of a release with inadequate dilution flow.** **EXAMINER NOTE:** **The Liquid Waste release Permit Report requires at least 27,600 gpm RL flow in order for the release to continue. If the applicant does NOT apply the dilution safety factor (listed in STEP 10 of this JPM), it will appear that adequate RL flow DOES exist (27,854 gpm). But with the required dilution safety factor, RL flow can only be calculated as 18,105 gpm: inadequate for the release to continue.** COMMENTS: **END OF TASK**	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. **Unit 1 is currently performing a liquid waste release from the Monitor Tank Building.**
2. **Low Pressure Service Water (RL) Flow transmitter 0RLP5080 (RL Disch Flow) and OAC points C1P0903 and C2P0903 (RL Line A Disch Flow-Hourly Average) are INOPERABLE and have been removed from service.**
3. **The RN system is aligned to the RL discharge header.**
4. **PT/0/A/4250/011 (RL Temperature and Discharge Flow Determination) was last completed at 0700.**
5. **Current time is 1030.**
6. **Units 1 and 2 are both at 100% power.**

INITIATING CUES:

You are directed to calculate the total RL discharge flow using Enclosure 13.2 (Total Discharge Flow Calculation Sheet) of PT/0/A/4250/011 and determine if adequate flow exists to continue the release per the LWR currently in progress. Record your answer in the spaces below.

Total RL Discharge Flow _____ GPM.

Adequate Flow Exists _____.
Yes/No

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

Unit 1 and Unit 2 Data Sheet for 1030

Unit 1 Cooling Tower Evaporation (PID C1P5853) – 13,500 GPM
Unit 2 Cooling Tower Evaporation (PID C2P5853) – 14,000 GPM

Low Pressure Service Water (RL) Status

RL pump A only is in service.
RL Header Pressure (0RLP5030) – 66 PSIG
Lake Wylie Level (0RNP7380) – 569 Feet

Nuclear Service Water (RN) Status

1B RN pump is in service
OAC points C1P5854, C1P5855, and C1P5856 are removed from service
RN Pump Train A flow (1RNP7520) – 0 GPM
RN Pump Train A flow (2RNP7520) – 0 GPM
RN Pump Train B flow (1RNP7510) – 17,000 GPM
RN Pump Train B Flow (2RNP7510) – 0 GPM

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DATA SHEET

Task: Quantify steam leak size

Alternate Path: N/A

Facility JPM #: RXM-004

Safety Function: N/A

K/A G2.1.20 Ability to interpret and execute procedure steps.

Importance: 4.6 / 4.6 **CFR:** 41.10 / 43.5 / 45.12

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator X In-Plant _____ Perform X Simulate _____

References: AP/1/A/5500/028 (Secondary Steam Leak), Revision 007
EP/1/A/5000/E-0, (Reactor Trip or Safety Injection), Revision 041

Task Standard: Applicant determines steam leak size exceeds 5% (approx. 7%) and requires a reactor trip. MSIVs are closed, and transition to E-0 is made.

Validation Time: 15 minutes **Time Critical:** Yes _____ No X

Applicant:
NAME_____ Docket #_____

Time Start: _____
Time Finish: _____

Performance Rating:

Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC #**
3. **Enter the password.**
4. **Select "Yes" on the INITIAL CONDITION RESET pop-up window.**
5. **Ensure simulator setup per table below.**
6. **Do NOT go to RUN.**

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	MAL-SM009 (SM HEADER BREAK)	**9.5e+5**				
	Take actions of AP/28 up to step 16.					

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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

A steam leak has occurred on the Main Steam header, AP/1/A/5500/028 (Secondary Steam Leak) has been entered and is complete through step 15.

INITIATING CUES:

Begin at step 16 and determine:

1) Size of steam leak - _____%___

2) Reactor Trip required - ___YES / NO___

EXAMINER NOTE: After reading Initiating Cue, provide the applicant with a copy of AP/1/A/5500/028 complete through step 15.

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STEP / STANDARD	SAT / UNSAT

START TIME: _____

STEP 1: 16. **Determine approximate steam leak size as follows:** a. Verify - TURBINE ONLINE. STANDARD: Applicant determines turbine is online by indication of MWs and/or generator breakers closed. COMMENTS:	**___ SAT** **___ UNSAT**

STEP 2: 16. b. Ensure stable plant conditions: □ Stable T-Avg □ Condenser dump valves closed. STANDARD: Applicant determines T-Avg is stable and condenser dumps closed by GREEN closed lights lit. COMMENTS:	**___ SAT** **___UNSAT**

STEP / STANDARD	SAT / UNSAT
NOTE • In the following step, "turbine power" is the calculated value obtained from the X axis, using indicated Turbine Impulse Pressure as the Y axis value. • OAC turn on code "DBK" can be used. STEP 3: 16. c. Determine turbine power level. **REFER TO** OAC Data Book file "TURB_IMP.XYP Turbine Impulse Pressure" located under "Secondary Systems" tab. STANDARD: Applicant uses indications from OAC Data Book file to determine turbine power is approx _____%. (Value specific to IC.) **This step is critical to determine turbine power, which is necessary to calculate the size of the steam leak.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
NOTE Secondary plant configuration can affect Thermal Power Best Estimate. Diverse reactor power indications should be used to determine reactor power. STEP 4: 16. d. Determine reactor power by evaluating the following indications: • Thermal Power Best Estimate • Nuclear instrumentation • NC Loop delta Ts STANDARD: Applicant determines reactor power is approx ____%. (Value is specific to IC.) **This step is critical to determine Reactor power which is necessary to calculate the size of the steam leak.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 5: 16. e. Verify difference between reactor power and turbine power - LESS THAN 5%. STANDARD: Applicant determines the difference between reactor power and turbine power is 6% - 7%. **This step is critical to determine steam leak size and subsequent actions.** COMMENTS:	**CRITICAL TASK** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 6: 16. e. RNO Perform the following: 1) Notify RP of leak size. 2) **GO TO** Step 19. STANDARD: Applicant notifies RP, and then proceeds to step 19. **Examiner Cue: Repeat back information as required. 'This is Tad in RP; I understand the leak size is ____'.** COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 7: 19. **Perform the following:** a. Verify steam leak - KNOWN TO BE ISOLABLE BY TURBINE TRIP. STANDARD: Applicant determines the leak is on the SM header per the initiating cue and that it is not isolable by a turbine trip. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 8: 19. a. RNO Perform the following: 1) Trip reactor. STANDARD: Applicant determines that the reactor needs to tripped. **This step is critical to initiate actions to address the steam leak.** **Examiner Cue: When applicant determines that the reactor needs to be tripped, "This JPM is complete."** COMMENTS: **END OF TASK**	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

A steam leak has occurred on the Main Steam header, AP/1/A/5500/028 (Secondary Steam Leak) has been entered and is complete through step 15.

INITIATING CUES:

Begin at step 16 and determine:

1) Size of steam leak - _____%___

2) Reactor Trip required - ___YES / NO___

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SRO

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DATA SHEET

Task: Make Emergency Classification and Complete the Initial Emergency Notification Form

Alternate Path: N/A

Facility JPM #: SEP-018

Safety Function: N/A

K/A 2.4.40 Knowledge of SRO responsibilities in emergency plan implementation.

Importance: 2.7 / 4.5 **CFR:** 41.10 / 43.5 / 45.11

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator _____ Classroom __X__ Perform __X__ Simulate _____

References: RP/0/A/5000/001 (Classification of Emergency), revision 029

Task Standard: Event classified as a "Site Area Emergency" based on the criteria in 4.1.C.4 and 4.1.N.2 (or N.3).
Obtain the preprinted Emergency Notification sheet or complete a blank one for 4.1.S.3. Fill out the sheet within 15 minutes from the time the classification is made.

Validation Time: 22 minutes **Time Critical:** Yes __X__ No _____

Applicant:
NAME_____ Docket #_____

Time Start: _____
Time Finish: _____

Performance Rating:

Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

- A Unit 1 transient initially caused an OP Delta T Reactor Trip signal.
- The reactor failed to automatically trip.
- The crew successfully completed a manual reactor trip 10 minutes ago.
- Almost immediately, the unit safety injected.
- The crew entered EP/1/A/5000/E-0 (Reactor Trip or Safety Injection).
- 1C Steam Generator has a stuck open S/G safety.
- The crew is transitioning to EP/1/A/5000/E-2 (Faulted Steam Generator Isolation).

The transition brief contained the following additional information:

- NC pumps had to be tripped due to a loss of subcooling.
- NC pressure is 600 psig and stable.
- 1ETB has an unknown fault and is currently de-energized.
- EMF Trip 2 alarms are in:
  - 1EMF-28 (Steam Line Monitor)
  - 1EMF-33 (Condenser Air Ejector Monitor)
  - 1EMF-72, 73 (N-16 Steam Line Monitors)

Current meteorological data:

- Clear conditions.
- Wind speed is 5 mph.
- Wind direction is 270°.

INITIATING CUES:

Classify the event and fill out the initial Emergency Notification form through the date and time that you approve it.

This JPM is time critical.

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EXAMINER NOTE:

If applicant asks for instructions on filling out the Emergency Notification Form, provide a copy of:

- RP/0/A/5000/006 A (Notifications to States and Counties from the Control Room), Enclosure 4.1, "Emergency Notification Form Completion", 7 pages

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STEP / STANDARD	SAT / UNSAT

START TIME: _____

STEP 1: Classify the event using RP/0/A/5000/001, Classification of Emergency. STANDARD: **Applicant classifies the event as a "Site Area Emergency" due to: Event #4.1.C.4 and #4.1.N.2 or 3.** **3 points 4.1.C.4 (SG Secondary Side Release With Primary to Secondary Leakage).** **AND** **5 points 4.1.N.2 (Greater than available makeup capacity as indicated by a loss of NCS Subcooling).** **OR** **5 points 4.1.N.3 (Indication that a SG is ruptured and has a Non-Isolable secondary side fault.).** **EXAMINER NOTE:** **It is critical that the classification be made and the emergency be declared within 15 minutes of the recorded start time.** **TIME EMERGENCY DECLARED _____.** **This step is critical to ensure the proper classification will be communicated.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

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STEP / STANDARD	SAT / UNSAT
STEP 2: Obtain Emergency Notification form. STANDARD: Applicant obtains a blank Emergency Notification form (provided by Examiner). **This step is critical to ensure that the proper form is transmitted.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 3: Complete the Emergency Notification Form. **EXAMINER NOTE:** **For actual events, Lines 1, 3, 4, 5, 6, 9, 10 and 11 are critical entries based on the NRC Performance Indicator, but for exam purposes, CRITICAL STEPS are in BOLD below. Also see attached completed Emergency Notification Form KEY.** STANDARD: □ Line 1: "Drill" is marked. □ Line 2: "Initial" is marked. □ Line 3: Catawba Nuclear Site (pre-printed). □ **Line 4: Per attached KEY.** □ Line 5: "None" is marked. □ **Line 6: Emergency release "is occurring" due to 1EMF-33 indication of S/G tube leakage.** □ Line 7: "Under evaluation" marked. **EXAMINER CUE: "RP is determining release significance."** □ Line 8: "Stable " marked. □ Line 9: Not required for initial notifications, and NOT critical. If entered, wind direction is 270° and wind speed 5 mph. □ **Line 10: "Declaration" marked and enters current date and time.** □ **Line 11: Affected Unit(s) marked as "1".** □ Line 12: Marks box "A" and 0% power. **EXAMINER CUE: "The reactor was tripped 10 minutes ago."** Enters time minus 10 minutes and enters today's date. □ Line 13: Includes information on the loss of power and the ATWS. □ Lines 14,15 and 16 - see Examiner Cue below. **IF ASKED,** **EXAMINER CUE: "RP has not determined any release data."** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP / STANDARD	SAT / UNSAT
STEP 3 (cont.) **EXAMINER NOTE**: **These steps are not required for initial notifications.** □ Line 17: Signs as Emergency Coordinator. Date and time on line 17 is based on time of approval. See attached, completed, Emergency Notification sheet for a key. **Time Emergency Notification Form is completed: _____** **It is critical that the total time from the declaration time recorded in Step 1 to completing the Emergency Notification Form is ≤ 15 minutes.** COMMENTS:	

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

READ TO APPLICANT

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INITIAL CONDITIONS:

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- The crew successfully completed a manual reactor trip 10 minutes ago.
- Almost immediately, the unit safety injected.
- The crew entered EP/1/A/5000/E-0 (Reactor Trip or Safety Injection).
- 1C Steam Generator has a stuck open S/G safety.
- The crew is transitioning to EP/1/A/5000/E-2 (Faulted Steam Generator Isolation).

The transition brief contained the following additional information:

- NC pumps had to be tripped due to a loss of subcooling.
- NC pressure is 600 psig and stable.
- 1ETB has an unknown fault and is currently de-energized.
- EMF Trip 2 alarms are in:
  - 1EMF-28 (Steam Line Monitor)
  - 1EMF-33 (Condenser Air Ejector Monitor)
  - 1EMF-72, 73 (N-16 Steam Line Monitors)

Current meteorological data:

- Clear conditions.
- Wind speed is 5 mph.
- Wind direction is 270°.

INITIATING CUES:

Classify the event and fill out the initial Emergency Notification form through the date and time that you approve it.

This JPM is time critical.