Catawba Nuclear Station
JPM A
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EVALUATION SHEET

Task: Emergency Borate the Reactor Coolant System

Alternate Path: Yes

Facility JPM #: NV-017

Safety Function: 1 **Title:** Reactivity Control

K/A 004 A2.14 Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Emergency Boration

Rating(s): 3.8 / 3.9 **CFR:** 41.5 / 43/5 / 45/3 / 45/5

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

Simulator **X** In-**P**lant _____ **P**erform **X** **S**imulate _____

References: EP/1/A/5000/FR-S.1 (Nuclear Power Generation/ATWS) rev. 22

Task Standard: One NV pump running with its suction aligned to the FWST and isolated from the VCT.

Validation Time: 5 minutes **Time Critical:** Yes _____ No **X**

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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 #163**
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.**

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	MAL-IPX003A(REACTOR TRIP BKR A FAILURE)	ACTIVE				
	MAL-IPX003B (REACTOR TRIP BKR B FAILURE)	ACTIVE				
	VLV-NV043F (NV236B BORIC ACID TO CHG PMP VLV FAIL TO POSITION)	0				
	MAL-MT-007 (LOSS OF TURBINE LUBE OIL PRESSURE)	ACTIVE				
	Instructor will act as the OATC and be manually inserting control rods when the simulator is placed in RUN.					

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READ TO APPLICANT

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INITIAL CONDITIONS:

- **A valid reactor trip signal has been received.**
- **The reactor will NOT trip automatically or manually.**
- **A Red Path for Subcriticality is in effect.**
- **The OATC is inserting rods manually.**

INITIATING CUES:

The Control Room Supervisor instructs you to initiate emergency boration, per EP/1/A/5000/FR-S.1, (Nuclear Power Generation/ATWS), step 4.

EXAMINER NOTE: After reading cue, provide the applicant with a copy of EP/1/A/5000/FR-S.1 pages 3-5.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 4. **Initiate emergency boration of NC System as follows:** a. Ensure at least one NV pump - ON. STANDARD: Applicant verifies red “ON” light lit for “NV PMP 1A” or “1B” (1MC-10). COMMENTS:	**___ SAT** **___ UNSAT**
STEP 2 4. b. OPEN 1NV-236B (Boric Acid To NV Pumps Suct). STANDARD: Applicant depresses the red “OPEN” pushbutton for 1NV-236B and verifies the red “OPEN” light remains dark and the green “CLSD” light remains lit on 1MC-10. 1NV-236B remains closed. COMMENTS:	**___ SAT** **___UNSAT**
STEP 3 4. c. Ensure both boric acid transfer pump switches - IN THE "ON" POSITION. STANDARD: Applicant rotates the switches for “B/A XFER PMP 1A” and “B/A XFER PMP 1B” to the “ON” position. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 4 4. d. Verify emergency boration flow - GREATER THAN OR EQUAL TO 30 GPM. STANDARD: Applicant verifies "EMER BORATE FLOW" (1NVP5440) indicates 0 gpm (1MC-5) and transitions to the RNO. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 5 4. d. RNO d. Align NV pump suction to FWST as follows: 1) OPEN the following valves: • 1NV-252A (NV Pumps Suct From FWST) • 1NV-253B (NV Pumps Suct From FWST). STANDARD: Applicant depresses the red OPEN pushbuttons for 1NV-252A and 1NV-253B **This step is critical to align borated water to the suction of the charging pumps. Only ONE of the valves opened meets the Critical Step criteria.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 6 4. d. RNO d. 2) CLOSE the following valves: • 1NV-188A (VCT Otlt Isol) • 1NV-189B (VCT Otlt Isol). STANDARD: Applicant depresses the green CLSD pushbutton for 1NV-188A and 1NV-189B. **This step is critical to prevent borated water from going to the VCT instead of the suction of the charging pumps. Closing only ONE of the valves meets the intent of the Critical Step criteria.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 7 4. e. Verify the following charging line isolation valves - OPEN: • 1NV-312A (Chrg Line Cont Isol) follows: • 1NV-314B (Chrg Line Cont Isol). STANDARD: Applicant verifies the red OPEN lights lit and green CLSD lights dark on 1NV-312A and 1NV-314B. COMMENTS:	**___ SAT** **___ UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 8 4. f. Verify Pzr pressure - LESS THAN 2335 PSIG. STANDARD: Applicant verifies PZR pressure instruments (1NCP5161, 1NCP5150, 1NCP5170 and 1NCP5171) indicate less than 2335 psig (1MC-10) COMMENTS: **END OF TASK**	**___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
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INITIAL CONDITIONS:

- **A valid reactor trip signal has been received.**
- **The reactor will NOT trip automatically or manually.**
- **A Red Path for Subcriticality is in effect.**
- **The OATC is inserting rods manually.**

INITIATING CUES:

The Control Room Supervisor instructs you to initiate emergency boration, per EP/1/A/5000/FR-S.1, (Nuclear Power Generation/ATWS), step 4.

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EVALUATION SHEET

Task: Transfer the Emergency Core Coolant System to the Cold Leg Recirculation

Alternate Path: Yes

Facility JPM #: NI-088

Safety Function: 2 **Title:** Emergency Core Cooling System (ECCS)

K/A 006 A4.07 Ability to manually operate and/or monitor in the control room: ECCS pumps and valves.

Rating(s): 4.4 / 4.4 **CFR:** 41.7 / 45.5 to 45.8

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

Simulator **X** In-**P**lant _____ **P**erform **X** **S**imulate _____

References: EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation) rev. 29

Task Standard: EP/1/A/5000/ES-1.3 Transfer to Cold Leg Recirculation) step 6 is performed and the 1A and 1B NV (Chemical Volume and Control System) and NI (Safety Injection System) pumps are secured.

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

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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 #164**
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.**

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	VLV-NI037F (NI184B CNMT SUMP LINE 1B ISOL (STEM) FAIL TO POSITION)	**0**				
	MAL-NC013A (NC COLD LEG A LEAK)	**27.5**				
	VLV-ND005F (ND28A ND HX A OUTLET TO CHARG AB FAIL TO POSITION.	**0**				

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INITIAL CONDITIONS:

- **A LOCA has occurred on Unit 1.**

INITIATING CUES:

- **1AD-9, E/8 'FWST LO-LO LEVEL' annunciator is lit and the Control Room Supervisor instructs you, as the BOP, to transfer to Cold Leg Recirculation using EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation) step 6.**

EXAMINER NOTE: After reading the cue, provide the applicant with a copy of EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation) complete through step 8 with step 6 flagged.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 6. **<u>WHEN</u> FWST level decreases to 5% (1AD-9, E/8 "FWST LO-LO LEVEL"), <u>THEN</u> align NV and NI Systems for recirc as follows:** a. Ensure Enclosure 1 (Foldout Page) is monitored. <u>STANDARD</u>: Applicant reads the step. **Examiner Cue: "The OATC will monitor Enclosure 1"** <u>COMMENTS:</u>	**___ SAT** **___ UNSAT**

<u>NOTE</u> CSF should not be implemented until directed by this procedure. <u>STEP 2</u> b. Verify at least one of the following annunciators - LIT: • 1AD-20, B/2 "CONT. SUMP LEVEL >2.5 ft" OR • 1AD-21, B/2 "CONT. SUMP LEVEL >2.5 ft". <u>STANDARD</u>: Applicant determines that one or both annunciators are lit. <u>COMMENTS:</u>	**___ SAT** **___UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3 c. Verify both ND pumps - ON. STANDARD: Applicant determines that only 1 ND pump is running and transitions to the RNO COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 4 6.c. RNO c. Perform the following: 1) **IF** 1NI-185A (ND Pump 1A Cont Sump Suct) is open, **THEN** start ND pump 1A. STANDARD: Applicant determines that ND PUMP 1A is on by verifying the red ON light is lit on 1MC-11. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 5 2) **IF** 1NI-184B (ND Pump 1B Cont Sump Suct) is open, **THEN** start ND pump 1B. STANDARD: Applicant determines that 1NI-184B is not open by verifying the green CLSD light is lit on 1MC-11 and determines that the step is not applicable. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 6 3) **IF** any ND pump running with suction aligned to sump, **THEN GO TO** Step 6.d. STANDARD: Applicant determines that ND Pump 1A is running with suction aligned to the sump and proceeds to step 6.d. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 7 6. d. Ensure the following valves - CLOSED: • 1ND-32A (ND Train 1A Hot Leg Inj Isol) • 1ND-65B (ND Train 1B Hot Leg Inj Isol). STANDARD: Applicant depresses the green CLOSE pushbuttons for 1ND-32A and 1ND-65B on 1MC-11. **This step is critical to prevent pump run out should only one ND pump be running.** **Examiner NOTE: Only one of the valves need to be closed to satisfy the critical step since the valves are in series.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 8 6. e. Isolate NI Pump Miniflow as follows: 1) Verify NC pressure - LESS THAN 1620 PSIG. STANDARD: Applicant determines that NC (Reactor Coolant System) pressure is less than 1620 psig. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 9 2) Ensure the following valves - CLOSED: • 1NI-115A (NI Pump 1A Miniflow Isol) • 1NI-144A (NI Pump 1B Miniflow Isol). STANDARD: Applicant determines that the green CLSD lights are lit for 1NI-115A and 1NI-144A on 1MC-11. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 10 3) Ensure "PWR DISCON FOR 1NI-147B" switch in "ENABLE". STANDARD: Applicant determines that the “PWR DISCON FOR 1NI-147B” is in “ENABLE” on 1MC-11. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 11 4) Ensure 1NI-147B (NI Miniflow Hdr To FWST Isol) - CLOSED. STANDARD: Applicant determines that the green CLSD light is lit for 1NI-147B on 1MC-11. COMMENTS:	___ SAT ___ UNSAT
STEP 12 6. f. Verify at least one of the following NV pumps miniflow valves - CLOSED: • 1NV-203A (NV Pumps A&B Recirc Isol) OR • 1NV-202B (NV Pmps A&B Recirc Isol). STANDARD: Applicant determines that the green CLSD lights are lit for 1NV-203A & 1NV-202B on 1MC-10. COMMENTS:	___ SAT ___ UNSAT
STEP 13 g. Ensure 1NI-334B (NI Pump Suct X-Over From ND) - OPEN. STANDARD: Applicant determines the red OPEN light is lit for 1NI-334B on 1MC-11. COMMENTS:	___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 14 h. OPEN the following valves: • 1NI-332A (NI Pump Suct X-Over From ND) • 1NI-333B (NI Pump Suct From ND). STANDARD: Applicant depresses the red OPEN pushbuttons for 1NI-332A and 1NI-333B on 1MC-11. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 15 i. Align ND discharge to suction of NI and NV pumps as follows: 1) OPEN 1ND-28A (ND Supply To NV & 1A NI Pmps). STANDARD: Applicant depresses the red OPEN pushbutton for 1ND-28A on 1MC-11 and determines that the valve will not open and continues. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 16 2) OPEN 1NI-136B (ND Supply To NI Pump 1B). STANDARD: Applicant depresses the red OPEN pushbutton for 1NI-136B on 1MC-11, determines that the valve will not open and proceeds to the next step. **Examiner NOTE: 1NI-136B will not open due to an interlock with 1NI-184B** COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 17 j. Verify at least one ND train aligned to provide suction to NV and NI as follows: • A Train: • 1A ND pump running • 1ND-28A (ND Supply To NV & 1A NI Pmps) - OPEN. STANDARD: Applicant determines no train can be aligned to provide suction to NV and NI and proceeds to the RNO. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 18 6.j. RNO j. Perform the following: 1) **IF** either valve is in intermediate position, **THEN** allow 20 seconds for valve to open. STANDARD: Applicant determines that this step does not apply. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 19 2) **IF** either valve is open **AND** its associated ND pump on, **THEN GO TO** Step 6.k. STANDARD: Applicant determines that this step does not apply. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 20 3) **IF** both A train and B train unavailable, **THEN** trip all NV and NI pumps. STANDARD: Applicant determines both A train and B train are unavailable and depresses the green OFF pushbuttons for NV PMP 1A, NV PUMP 1B, NI PMP 1A and NI PUMP 1B. **This step is critical to protect the NV and NI pumps from damage from loss of suction and allow them to be available later when the FWST has been refilled.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 21 k. Isolate FWST from NV and NI pumps as follows: 1) Place "PWR DISCON FOR 1NI-100B" switch in "ENABLE". STANDARD: Applicant places the switch for “PWR DISCON FOR 1NI-100B” in the ENABLE position. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 22 2) CLOSE 1NI-100B (NI Pmps Suct From FWST). STANDARD: Applicant depresses the green CLOSE pushbutton for 1NI-100B on 1MC-11. COMMENTS:	___ SAT ___ UNSAT

STEP 23 3) CLOSE the following valves: • 1NV-252A (NV Pumps Suct From FWST) • 1NV-253B (NV Pumps Suct From FWST). STANDARD: Applicant depresses the green CLOSE pushbuttons for 1NV-252A and 1NV-253B on 1MC-10. COMMENTS: **END OF TASK**	___ SAT ___ UNSAT

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
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INITIAL CONDITIONS:

- **A LOCA has occurred on Unit 1.**

INITIATING CUES:

- **1AD-9, E/8 'FWST LO-LO LEVEL' annunciator is lit and the Control Room Supervisor instructs you, as the BOP, to transfer to Cold Leg Recirculation using EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation) step 6.**

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EVALUATION SHEET

Task: Isolate Cold Leg Accumulators Following a Shutdown LOCA

Alternate Path: Yes

Facility JPM #: N/A

Safety Function: 3 **Title:** Emergency Core Cooling System (ECCS)

K/A 006 A1.13 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: Accumulator pressure (level, boron concentration)

Rating(s): 3.5 / 3.7 **CFR:** 41.5 / 45.5

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

Simulator **X** In-**P**lant _____ **P**erform **X** **S**imulate _____

References: AP/1/A/5500/027 (Shutdown LOCA) rev. 38, Enclosure 14 (Isolating Cold Leg Accumulators)

Task Standard: AP/1/A/5500/027 (Shutdown LOCA) Enclosure 14 (Isolating Cold Leg Accumulators) is performed and 1A & 1D Cold Leg Accumulators are isolated and 1B & 1C Cold Leg Accumulators are vented to containment.

Validation Time: 10 minutes **Time Critical:** Yes _____ No **X**

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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 # 165**
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.**

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	ANN-AD11-B03 (TRANSFORMER A TROUBLE)	ON				
	ANN-AD11-E03 (TRANSFORMER B TROUBLE)	ON				
	MAL-NC013B (NC COLD LEG B LEAK)	0.5				
	VLV-NI008F (NI65B ACCUM ISOL VLV FAIL TO POSITION)	1				
	VLV-NI011F (NI76A ACCUM ISOL VLV FAIL TO POSITION)	1				

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INITIAL CONDITIONS:

- **Unit 1 is in Mode 4.**
- **Unit 1 shutdown was in progress for a refueling outage, when pressurizer pressure and level began to decrease uncontrollably.**
- **The CRS has entered AP/1/A/5500/027 (Shutdown LOCA) to address the reactor coolant system leak.**

INITIATING CUES:

- **The CRS has directed you to isolate the Unit 1 Cold Leg Accumulators by performing AP/1/A/5500/027 (Shutdown LOCA) Enclosure 14 (Isolating Cold Leg Accumulators).**
- **An AO has been dispatched to restore power to all CLA discharge isolation valves per EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 9 (Power Alignment for CLA Valves).**

EXAMINER NOTE: After reading the cue, provide the applicant with a copy of AP/1/A/5500/027 Enclosure 14.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 1. **Dispatch operator to restore power to all CLA discharge isolation valves. REFER TO EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 9 (Power Alignment for CLA Valves)** STANDARD: Per initiating cue, the applicant should realize that this step is complete. Also valve indication for each of the CLA discharge isolation valves is available, due to power already being aligned by the AO. **Examiner Cue: If asked, "Power has been restored to all Cold Leg Accumulator discharge isolation valves."** COMMENTS:	**___ SAT** **___ UNSAT**

STEP 2: 2. **Ensure S/I - RESET** a. ECCS b. D/G load sequencers c. **IF AT ANY TIME** a B/O occurs, **THEN** restart S/I equipment previously on. STANDARD: Applicant verifies that the yellow ECCS and D/G load sequencer RESET lights are lit. Applicant acknowledges the If at any time statement. COMMENTS:	**___ SAT** **___UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3: 3. **WHEN power is aligned, THEN perform the following:** a. CLOSE the following valves: • **1NI-54A (C-Leg Accum A Disch Isol)** • 1NI-65B (C-Leg Accum B Disch Isol) • 1NI-76A (C-Leg Accum C Disch Isol) • **1NI-88B (C-Leg Accum D Disch Isol)** STANDARD: Applicant depresses the green CLOSE pushbutton for the valves listed, and verifies the green CLSD light lit and red OPEN light dark for valves 1NI-54A & 1NI-88B. Applicant also verifies the red OPEN light lit and green CLSD light dark for valves 1NI-65B & 1NI-76A and transitions to the RNO. **The critical part of this step is to close isolation valves 1NI-54A & 1NI-88B. The other 2 Cold Leg Accumulators will be vented to containment in subsequent steps in the RNO.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 4: 3.RNOa. Perform the following: 1) Ensure containment isolation signals – RESET: • Phase A • Phase B STANDARD: Applicant verifies that the yellow RESET lights are lit for both trains Phase A and Phase B isolations. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 5: 2) Ensure 1VI-77B (VI Cont Isol) - OPEN STANDARD: Applicant determines that the red OPEN light lit and green CLSD light dark for 1VI-77B. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 6 3) **IF** VI pressure is less than 85 PSIG, **THEN** dispatch operator to ensure proper VI compressor operation. STANDARD: Applicant determines that VI pressure is ~ 90 PSIG. This step is N/A. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 7: 4) Vent any CLA which cannot be isolated as follows: a) OPEN 1NI-47A (C-Leg Accum N2 Sup Cont Isol) STANDARD: Applicant depresses the red OPEN pushbutton for 1NI-47A and verifies the red OPEN light lit and green CLSD light dark. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 8: b) Place breaker 1CB-1 (behind 1MC-6)(Key #11) to - ON STANDARD: Applicant lifts breaker 1CB-1 fully up to the ON position. **This step is critical to place power on Cold Leg Accumulator Nitrogen supply isolation valves for 1B and 1C CLAs which will be opened in the next step to allow venting the accumulators to containment.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 9: c) OPEN valve for CLA(s) to be vented: • 1NI-50 (C-Leg Accum A N2 Supply Isol) • **1NI-61 (C-Leg Accum B N2 Supply Isol)** • **1NI-72 (C-Leg Accum C N2 Supply Isol)** • 1NI-84 (C-Leg Accum D N2 Supply Isol) STANDARD: Applicant depresses the red OPEN pushbutton and verifies the red OPEN light lit and green CLSD light dark for 1NI-61 and 1NI-72. **This step is critical due to not being able to isolate these CLAs. If these CLAs are not vented to reduce the N2 overpressure, it could cause a hard bubble to form in the reactor coolant system as reactor coolant pressure continues to decrease.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 10: d) CLOSE 1NI-47A. STANDARD: Applicant depresses the green CLOSE pushbutton and verifies the green CLSD light lit and red OPEN light dark for 1NI-47A. **This step is critical to allow venting the 1B and 1C CLAs.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 11: e) OPEN 1NI-83 (C-Leg Accums N2 Vent Ctrl) to depressurize affected CLA(s). STANDARD: Applicant rotates potentiometer for 1NI-83 clockwise to begin venting the 1B and 1C CLAs. **This step is critical to vent the 1B and 1C CLAs.** **NOTE TO EVALUATOR: The time to fully vent the 1B & 1C CLAs would be approximately 30 minutes. The critical steps for this JPM have been met at this point and the JPM may be terminated at your discretion.** **EVALUATOR CUE: "Another operator will continue to vent the 1B and 1C Cold Leg Accumulators. This JPM is complete."** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
May 2015 NRC Initial License Exam
JPM C

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 1 is in Mode 4.**
- **Unit 1 shutdown was in progress for a refueling outage, when pressurizer pressure and level began to decrease uncontrollably.**
- **The CRS has entered AP/1/A/5500/027 (Shutdown LOCA) to address the reactor coolant system leak.**

INITIATING CUES:

- **The CRS has directed you to isolate the Unit 1 Cold Leg Accumulators by performing AP/1/A/5500/027 (Shutdown LOCA) Enclosure 14 (Isolating Cold Leg Accumulators).**
- **An AO has been dispatched to restore power to all CLA discharge isolation valves per EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 9 (Power Alignment for CLA Valves).**

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JPM D

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EVALUATION SHEET

Task: Establish NC system Bleed and Feed per EP/1/A/5000/FR-H.1

Alternate Path: Yes

Facility JPM #: NC-046

Safety Function: 4P **Title:** Reactor Coolant System

K/A 002 A2.04 Ability to (a) predict the impacts of the following malfunctions or operations on the RCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of heat sinks

Rating(s): 4.3 / 4.6 **CFR:** 41.5 / 43.5 / 45.3 / 45.5

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

Simulator **X** In-**P**lant _____ **P**erform **X** **S**imulate _____

References: EP/1/A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink) rev. 42

Task Standard: Aligns S/I feed path using NI and NV pumps and opens 1NC-32B and 1NC-34A PZR PORVs to establish NC system bleed path

Validation Time: 10 minutes **Time Critical:** Yes _____ No **X**

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Applicant: Time Start: _____

NAME_____ Docket #_____ Time Finish: _____

Performance Rating: Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____

NAME SIGNATURE DATE

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COMMENTS

Catawba Nuclear Station
JPM D
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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC #166.**
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.**

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	MAL-CA003A CAPT SA2 FAILS TO START	Active				
	MAL-CA003B CAPT SA5 FAILS TO START	Active				
	MAL-CA004A FAILURE OF CA PUMP A TO START	Both				
	MAL-CA004B FAILURE OF CA PUMP B TO START	Both				
	MAL-NI001B NI PUMP B FAILURE	Auto				
	OVR-ISE043 SAFETY INJECTION INITIATE PB TRN B	Off				
	MAL-ISE002B (AUTO SI TRN B FAILS TO ACTUATE)	Active				
	VLV-NI001F (NI9A B.I.T. DISCHARGE ISOL VLV FAIL TO POSITION)	0				

Catawba Nuclear Station
JPM D
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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 reactor trip has occurred on Unit 1 due to a loss of both Main Feedwater pumps.**
- **The CA system will not function.**
- **Attempts to restart the Main CF pumps have been unsuccessful.**
- **EP/1/A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink) has been entered due to a "RED PATH" for the Heat Sink critical safety function while performing EP/1/A/5000/ES-0.1 (Reactor Trip Response).**
- **Bleed and Feed initiation criteria have been met.**

INITIATING CUES:

- **The CRS instructs you to initiate NC system bleed and feed by performing steps 19-24 of EP/1/A/5000/FR-H.1. Inform the CRS when the bleed and feed path has been initiated and verified.**

EXAMINER NOTE: After reading cue, provide the applicant with a copy of EP/1/A/5000/FR-H.1 pages 28-36.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 19. Perform Steps 20 through 24 quickly to establish NC heat removal by NC bleed and feed. STANDARD: Applicant acknowledges this step. COMMENTS:	**___ SAT** **___ UNSAT**

STEP 2 20. Ensure all NC pumps - OFF. STANDARD: Applicant ensures the NC pumps are off. COMMENTS:	**___ SAT** **___UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3 21. Initiate S/I. STANDARD: Applicant depresses the red train 'A' and 'B' "SAFETY INJECTION INITIATE" pushbuttons and verifies the red "SAFETY INJECTION ACTUATED" status light is lit on 1SI-13 or "ECCS TRN A" yellow reset light is dark on 1MC-11. **This step is critical to start the NI pump and align the valves required for initiating an NC system feed path.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 4 22. Verify NC System feed path as follows: a. Verify the following pumps - ON: • At least one NV pump • At least one NI pump. STANDARD: Applicant determines that at least one NV pump and one NI pump are running. **EXAMINER NOTE:** **Applicant may start 1B NI pump and 1B NV pump at this time due to it being a failed auto action. If not, the procedure will direct starting these pumps in the upcoming steps.** COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 5 22 b. Verify "NV S/I FLOW" – INDICATING FLOW. STANDARD: Applicant determines that 1NVP6080 (NV S/I FLOW) on 1MC-3 indicates 0 GPM and transitions to the RNO. COMMENTS:	___ SAT ___ UNSAT
STEP 6 22 b. RNO Perform the following: 1) Ensure the following pumps - ON: • NV Pumps • NI Pumps. STANDARD: Applicant ensures that all NV pumps and NI pumps are running by depressing the red ON pushbuttons for any non-running pump, and verifying the red ON lights are lit and green OFF lights are dark for all pumps. COMMENTS:	___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 7 22 b. RNO 2) **IF** at least one NV pump in service, **THEN** perform the following: a) Ensure the following valves - OPEN: • 1NV-252A (NV Pumps Suct From FWST) • 1NV-253B (NV Pumps Suct From FWST). STANDARD: Applicant verifies the red OPEN lights lit and green CLSD lights dark on 1NV-252A and 1NV-253B. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 8 22 b. RNO 2) b) Ensure the following valves - CLOSED: • 1NV-188A (VCT Otlt Isol) • 1NV-189B (VCT Otlt Isol). STANDARD: Applicant determines that the green CLSD light is lit and red OPEN light is dark on 1NV-188A. Applicant determines that the green CLSD light is dark for 1NV-189B, and depresses the green CLOSE pushbutton and verifies the green CLSD light is lit and the red OPEN light is dark. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 9 22 b. RNO 2) c) Ensure the following valves - OPEN: • 1NI-9A (NV Pmp C/L Inj Isol) • 1NI-10B (NV Pmp C/L Inj Isol). STANDARD: Applicant determines the red OPEN light is dark and green CLSD light is lit on 1NI-9A and 1NI-10B. Applicant depresses the red OPEN pushbutton for 1NI-9A but the valve will not open. Applicant depresses the red OPEN pushbutton for 1NI-10B and verifies the red OPEN light is lit and the green CLSD light is dark. **This step is critical to align an NC (Reactor Coolant) system Feed path.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 10 22 b. RNO 3) **IF** NI Pump 1A is in service, **THEN** ensure the following valves - OPEN: • 1NI-103A (NI Pump 1A Suct) • 1NI-118A (NI Pump 1A C-Leg Inj Isol) • 1NI-162A (NI To C-Legs Inj Hdr Isol) • 1NI-100B (NI Pmps Suct From FWST). STANDARD: Applicant determines that the red OPEN light is lit and green CLSD light is dark on valves 1NI-103A, 1NI-118A, 1NI-162A, and 1NI-100B. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 11 22 b. RNO 4) **IF** NI Pump 1B is in service, **THEN** ensure the following valves - OPEN: • 1NI-135B (NI Pump 1B Suct) • 1NI-150B (NI Pump 1B C-Leg Inj Isol) • 1NI-162A (NI To C-Legs Inj Hdr Isol) • 1NI-100B (NI Pmps Suct From FWST). STANDARD: Applicant verifies that the red OPEN light is lit and green CLSD light is dark on valves 1NI-135B, 1NI-150B, 1NI-162A, and 1NI-100B. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 12 22 b. RNO 5) **IF** no feed path can be aligned, **THEN** perform the following: STANDARD: Applicant determines that a feed path does exist and this step is N/A. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 13 23. Establish NC System bleed path as follows: a. Ensure all Pzr PORV isolation valves - OPEN. STANDARD: Applicant determines the RED lights are lit and GREEN lights are dark on valves 1NC-31B, 1NC-35B, and 1NC-33A. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 14 23 b. Select "OPEN" on the following PZR PORVs: • 1NC-34A (PZR PORV) • 1NC-32B (PZR PORV). STANDARD: Applicant rotates switches for 1NC-34A and 1NC-32B, clockwise to the OPEN position and verifies RED lights are lit and GREEN lights are dark on both valves. **This step is critical because it establishes an NC (Reactor Coolant) system Bleed path.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 15 23 c. Align N_2 to Pzr PORVs by opening the following valves: • 1NI-438A (Emer N2 From CLA A To 1NC-34A) • 1NI-439B (Emer N2 From CLA B To 1NC-32B). STANDARD: Applicant depresses the red OPEN pushbutton and verifies red OPEN light lit and green CLSD light dark on valves 1NI-438A and 1NI-439B. COMMENTS:	___ SAT ___ UNSAT
STEP 16 23 d. Verify power to all Pzr PORV isolation valves - AVAILABLE. STANDARD: Applicant verifies indicating lights lit on 1NC-31B, 1NC-35B, and 1NC-33A. COMMENTS:	___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 17 24. Verify the following valves - OPEN: • 1NC-31B (PZR PORV Isol) • 1NC-32B (PZR PORV) • 1NC-33A (PZR PORV Isol) • 1NC-34A (PZR PORV). STANDARD: Applicant verifies lights on 1NC-31B, 1NC-32B, 1NC-33A and 1NC-34A indicate OPEN. COMMENTS: **END OF TASK**	**___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
May 2015 NRC Initial License Exam
JPM D

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 reactor trip has occurred on Unit 1 due to a loss of both Main Feedwater pumps.**
- **The CA system will not function.**
- **Attempts to restart the Main CF pumps have been unsuccessful.**
- **EP/1/A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink) has been entered due to a "RED PATH" for the Heat Sink critical safety function while performing EP/1/A/5000/ES-0.1 (Reactor Trip Response).**
- **Bleed and Feed initiation criteria have been met.**

INITIATING CUES:

- **The CRS instructs you to initiate NC system bleed and feed by performing steps 19-24 of EP/1/A/5000/FR-H.1. Inform the CRS when the bleed and feed path has been initiated and verified.**

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EVALUATION SHEET

Task: Control Tavg using steam dumps in manual

Alternate Path: No

Facility JPM #: SM-100

Safety Function: 4S **Title:** Main and Reheat Steam System

K/A 039 A2.04 Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Malfunctioning steam dump

Rating(s): 3.4 / 3.7 **CFR:** 41.5 / 43.5 / 45.3 / 45.13

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

Simulator **X** In-**P**lant _____ **P**erform **X** **S**imulate _____

References: AP/1/A/5500/003 (Load Rejection) rev. 41 Case I (Switchyard available) step 3.

Task Standard: AP/1/A/5500/003 (Load Rejection) Case I (Switchyard available) step 3 is performed to operate the steam dumps in manual to ensure Tavg is decreasing to Tref and demonstrate proper control to not cause any unwanted actuations.

Validation Time: 16 minutes **Time Critical:** Yes _____ No **X**

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Applicant: Time Start: _____

NAME_____ Docket #_____ Time Finish: _____

Performance Rating: Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____

NAME SIGNATURE DATE

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COMMENTS

Catawba Nuclear Station
JPM E
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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC # 167**
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.**

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	MAL-EP003C Zone 1A Lockout	ACTIVE				
	OVR-IDE025A SBM-Steam Dump INTLK Byp Trn A – Byp INTLK Pos	ON				
	OVR-IDE025A SBM-Steam Dump INTLK Byp Trn A – Byp INTLK Pos	OFF				5
	IRX-009 Rods fail to move	BOTH				
	SET Event 5 x02I185r (Steam Dump Pressure Mode Switch to pressure)					5
	Ensure T-AVG > 3°F higher than T-REF					

Catawba Nuclear Station
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INITIAL CONDITIONS:

- **Unit 1 has experienced a Load Rejection due to a Zone A lockout.**
- **The immediate actions of AP/1/A/5500/003 (Load Rejection) have been completed.**
- **During the runback, the control rods stopped moving in auto and manual.**
- **The CRS and the OATC are responding using AP/1/A/5500/015 (Rod Control Malfunction).**

INITIATING CUES:

- **The CRS has directed you to perform step 3 of AP/1/A/5500/003.**

EXAMINER NOTE: After reading the cue, provide the applicant with a copy of AP/1/A/5500/003 with the immediate actions completed.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1 3. **Verify proper steam dump operation as follows:** a. Verify T-Ref instrumentation – AVAILABLE. STANDARD: Applicant determines T-Ref instrumentation is available on 1NCCR5441, Rod motion demand signals, or DCS "IRE" graphic or Steam Dump graphic. COMMENTS:	**___ SAT** **___ UNSAT**

STEP 2 3.b "C-9 COND AVAILABLE FOR STM DUMP" status light (1SI-18) – LIT. STANDARD: Applicant determines the C-9 status light on 1SI-18 is lit. COMMENTS:	**___ SAT** **___UNSAT**

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JPM E
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STEP/STANDARD	SAT/UNSAT
STEP 3 3.c Verify the following: • "C-7A LOSS OF LOAD INTLK COND DUMP" status light (1SI-18) – LIT. • Steam dump valves – MODULATING. STANDARD: Applicant determines the C-7A status light on 1SI-18 is lit. Applicant determines that the steam dump valves are not modulating and transitions to the RNO. COMMENTS:	**___ SAT** **___ UNSAT**

STEP 4 3.c.RNO.c **IF** steam dump valves are closed **AND** T-Avg is 3°F greater than T-Ref, **THEN**: 1) Place "STM DUMP CTRL" in manual STANDARD: Applicant determines that T-Avg is > 3°F higher than T-Ref and depresses the [M] pushbutton on the "STM DUMP CTRL". **This step is critical because it is required to control the steam dumps in manual to maintain NC temperature equal to reference temperature.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 5 3.c.RNO.c 2) Adjust "STM DUMP CTRL" to 0% demand. STANDARD: Applicant depresses the demand decrease (↓) pushbutton until 0% demand is displayed on "STM DUMP CTRL". **This step is critical to prevent the steam dumps from rapidly opening and causing an uncontrolled cool down when placing the steam dumps in pressure mode in the following step.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 6 3.c.RNO.c 3) Place the steam dumps in pressure mode. STANDARD: Applicant turns the steam dump mode select switch clockwise to the PRESS position. **This step is critical to be able to operate the steam dumps in manual.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 7 3.c.RNO.c 4) Operate condenser steam dump valves to maintain T-Avg at T-Ref. STANDARD: Applicant depresses the demand increase (↑) pushbutton to open the steam dump valves. **This step is critical to open the steam dump valves and to decrease T-Avg to T-Ref.** **EXAMINER NOTE: The intent of this JPM is for the applicant to control T-Avg using the steam dumps in manual. Once the applicant has established control of T-Avg (decreasing toward T-Ref) the following cue can be given at the examiners discretion:** **EXAMINER CUE: "The CRS will continue directing the operations of AP/03. This JPM is complete."** COMMENTS: **END OF TASK**	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
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JPM E

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 1 has experienced a Load Rejection due to a Zone A lockout.**
- **The immediate actions of AP/1/A/5500/003 (Load Rejection) have been completed.**
- **During the runback, the control rods stopped moving in auto and manual.**
- **The CRS and the OATC are responding using AP/1/A/5500/015 (Rod Control Malfunction).**

INITIATING CUES:

- **The CRS has directed you to perform step 3 of AP/1/A/5500/003.**

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EVALUATION SHEET

Task: Shift Upper Containment Ventilation Units

Alternate Path: No

Facility JPM #: NEW

Safety Function: 5 **Title:** Containment Cooling System

K/A 022 A4.01 Ability to manually operate and/or monitor in the control room: CCS fans

Rating(s): 3.6 / 3.6 **CFR:** 41.7 / 45.5 to 45.8

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

Simulator **X** In-**P**lant _____ **P**erform **X** **S**imulate _____

References: OP/1/A/6450/001 (Containment Ventilation (VV) Systems) rev. 42, Enclosure 4.12 (Shifting Operating Upper Containment Ventilation Units)

Task Standard: OP/1/A/6450/001 (Containment Ventilation (VV) Systems) Enclosure 4.12 (Shifting Operating Upper Containment Ventilation Units) performed to start 1D UCVU and shutdown 1C UCVU.

Validation Time: 5 minutes **Time Critical:** Yes _____ No **X**

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Applicant: Time Start: _____

NAME_____ Docket #_____ Time Finish: _____

Performance Rating: Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____

NAME SIGNATURE DATE

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COMMENTS

Catawba Nuclear Station
JPM F
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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC # 167 (This JPM written to be done with JPM E and will have the same simulator setup as JPM E).**
3. **Enter the password.**
4. **Select "Yes" on the INITIAL CONDITION RESET pop-up window.**
5. **Ensure simulator setup per table in JPM E.**
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.**

EXAMINER NOTE: This JPM can be performed in conjunction with JPM E.

Catawba Nuclear Station
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READ TO APPLICANT

DIRECTION TO APPLICANT:

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INITIAL CONDITIONS:

- **Unit 1 is at 48% power.**

INITIATING CUES:

- **The CRS has directed you to shift operating Upper Containment Ventilation Units by starting 1D UCVU and stopping 1C UCVU per OP/1/A/6450/001 (Containment Ventilation (VV) Systems) Enclosure 4.12 (Shifting Operating Upper Containment Ventilation Units).**

EXAMINER NOTE: After reading the cue, provide the applicant with a copy of OP/1/A/6450/001 (Containment Ventilation (VV) Systems) Enclosure 4.12 (Shifting Operating Upper Containment Ventilation Units).

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1 3.1 **IF** only one UCVU is running, perform the following: 3.1.1 **IF** the running UCVU is operating in the "NORM" mode, start the UCVU to be placed in service by placing its control switch in the "NORM" position: • "VV UCVU 1A" • "VV UCVU 1B" • "VV UCVU 1C" • **"VV UCVU 1D"** STANDARD: Applicant places the control switch for "VV UCVU 1D" to the "NORM" position. **This step is critical to meet the task of shifting operating UCVUs per the JPM standard.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 2 3.1.2 **IF** the running UCVU is operating in the "MAX" mode, start the UCVU to be placed in service by placing its control switch in the "MAX" position. STANDARD: Applicant determines this step is N/A. COMMENTS:	**___ SAT** **___UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3 3.1.3 Verify the red indicating lights illuminate for the UCVU placed in service. STANDARD: Applicant determines the red indicating light lit for the 1D UCVU. COMMENTS:	___ SAT ___ UNSAT

STEP 4 3.1.4 Verify the red indicating lights illuminate for the return fan placed in service. STANDARD: Applicant determines the red indicating light lit for return fan 1D. COMMENTS:	___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 5 3.1.5 Place the control switch for the UCVU to be stopped in the "OFF" position: • "VV UCVU 1A" • "VV UCVU 1B" • **"VV UCVU 1C"** • "VV UCVU 1D" STANDARD: Applicant places the control switch for the 1C UCVU to the "OFF" position. **This step is critical to meet the task of shifting operating UCVUs per the JPM standard.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 6 3.1.6 Verify the green indicating light illuminates for the UCVU fan stopped. STANDARD: Applicant determines the green indicating light lit for the 1C UCVU. COMMENTS:	**___ SAT** **___ UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 7 3.1.7 Verify the green indicating light illuminates for the return fan stopped. STANDARD: Applicant determines the green indicating light lit for the 1C return fan. COMMENTS:	**___ SAT** **___ UNSAT**
STEP 8 3.2 **IF** two or three UCVUs are running, perform the following: STANDARD: Applicant determines this step is N/A. COMMENTS:	**___ SAT** **___ UNSAT**
STEP 9 3.3 Indicate below the operating UCVUs: • "VV UCVU 1A" • "VV UCVU 1B" • "VV UCVU 1C" • "VV UCVU 1D" STANDARD: Applicant indicates that 1D UCVU is running. COMMENTS: **END OF TASK**	**___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
May 2015 NRC Initial License Exam
JPM F

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 1 is at 48% power.**

INITIATING CUES:

- **The CRS has directed you to shift operating Upper Containment Ventilation Units by starting 1D UCVU and stopping 1C UCVU per OP/1/A/6450/001 (Containment Ventilation (VV) Systems) Enclosure 4.12 (Shifting Operating Upper Containment Ventilation Units).**

Catawba Nuclear Station
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JPM G

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EVALUATION SHEET

Task: Reset Radiation Monitor Trip Setpoints

Alternate Path: No

Facility JPM #: WE-EMF-001

Safety Function: 7 **Title:** Process Radiation Monitoring System

K/A 073 A4.02 Ability to manually operate and/or monitor in the control room: Radiation monitoring system control panel

Rating(s): 3.7 / 3.7 **CFR:** 41.7 / 45.5 to 45.8

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

Simulator **X** In-**P**lant _____ **P**erform **X** **S**imulate _____

References: OP/0/A/6500/080 (EMF RP86A Output Modules) rev. 17, Enclosure 4.2 (EMF RP86A Trip Setpoint Adjustment)

Task Standard: EMF50L TRIP 1 setpoint set to 6.3 E3 CPM and the TRIP 2 setpoint set to 9.0 E3 CPM per OP/0/A/6500/080 (EMF RP86A Output Modules) Enclosure 4.2 (EMF RP86A Trip Setpoint Adjustment).

Validation Time: 10 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

Catawba Nuclear Station
JPM G
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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. **Ensure copy of EMF-50 setpoint log page has been replaced.**
9. **Place simulator in FREEZE until Examiner cue is given.**

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event

Catawba Nuclear Station
JPM G
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READ TO APPLICANT

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INITIAL CONDITIONS:

- **Unit 1 is at 100% power.**

INITIATING CUES:

Following a discussion with Glenn from RP concerning a premature gaseous release termination, the Control Room Supervisor directs you to set EMF 50L setpoints using OP/0/A/6500/080 (EMF RP86A Output Modules) Enclosure 4.2 (EMF RP86A Trip Setpoint Adjustment) to the following values:

- **Trip 1 = 6300 CPM**
- **Trip 2 = 9000 CPM**

OAC Program EMFLIB is currently not available.

EXAMINER NOTE: After reading the cue, provide the applicant with a copy of OP/0/A/6500/080 (EMF RP86A Output Modules) Enclosure 4.2 (EMF RP86A Trip Setpoint Adjustment).

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

NOTE: 1. If desired, EMF setpoints adjustments may be performed from the "EMF SETPOINT" screen of OAC EMF Library (EMFLIB) Application. EMFLIB is user friendly, no procedure instructions are provided for this application.
2. The Trip Lamps can only be cleared if the activity level has decreased below the Trip Setpoint.
3. If any trip setpoint is >1000 cpm, the entered setpoint should be rounded down to the nearest 100 prior to entering to ensure the entered setpoint remains conservative.

STEP 1 3.1 **IF** necessary, press the clear key [CLR] to reset trip lamps STANDARD: Applicant verifies trip lamps dark or depresses the [CLR] key to clear alarms. COMMENTS:	**___ SAT** **___ UNSAT**

STEP 2 3.2 Press the function key [FUN] to bring up the "SELECT FUNCTION" screen. STANDARD: Applicant depresses the [FUN] key to bring up the "SELECT FUNCTION" screen. **This step is critical, due to being the only way to get to the select function screen, which is required to input new Trip 1 and Trip 2 values.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3 3.3 Adjust Trip 1 Setpoint as follows: 3.3.1 Press [1] for Trip 1 setting display screen. STANDARD: Applicant depresses the [1] to bring up the Trip 1 setting display screen. **This step is critical to bring up the screen that the new Trip 1 setting will be input into.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 4 3.3.2 Key in the desired Trip 1 setpoint. STANDARD: Applicant keys in 6300 CPM using the numeric keypad. **This step is critical to input the new Trip 1 setpoint required to meet the task standard. This new setpoint is checked in the next step. The critical requirement is for the new trip setpoint of 6300 CPM to be entered by the end of this JPM.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 5 3.3.3 Ensure the setpoint is correctly displayed in the "ENTER" block on the setpoint display screen. STANDARD: Applicant ensures 6300 CPM is displayed in the ENTER block. **This step is only critical if setpoint was entered wrong in the previous step.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
NOTE: Once the enter key [ENT] is pressed, the change in Trip 1 alarm setpoint is active.	

STEP 6 3.3.4 Press the enter key [ENT]. This value is now displayed under "Trip 1" and the "ENTER" block is cleared. STANDARD: Applicant presses the [ENT] key and verifies the correct value under the "Trip 1" on the display. **This step is critical to input the new Trip 1 setpoint. Again the critical requirement is to have the Trip 1 setpoint set to 6300 CPM by the end of the JPM.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 7 3.3.5 Press the clear key [CLR] to return to the "SELECT FUNCTION" screen. STANDARD: Applicant presses the [CLR] key to return to the "SELECT FUNCTION" screen. COMMENTS:	___ SAT ___ UNSAT
STEP 8 3.4 Adjust Trip 2 Setpoint as follows: 3.4.1 Press [2] for Trip 2 setting display screen. STANDARD: Applicant presses [2] to bring up the Trip 2 setting display screen. **This step is critical to get to the required screen to input the new Trip 2 setpoint.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 9 3.4.2 Key in the desired Trip 2 setpoint. STANDARD: Applicant enters 9000 CPM using the numeric keypad. **This step is critical to input the new Trip 2 setpoint required to meet the task standard. This new setpoint is checked in the next step. The critical requirement is for the new trip setpoint of 9000 CPM to be entered by the end of this JPM.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 10 3.4.3 Ensure the setpoint is correctly displayed in the "ENTER" block on the setpoint display screen. STANDARD: Applicant ensures 9000 CPM is displayed in the ENTER block. **This step is only critical if setpoint was entered wrong in the previous step.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
NOTE: Once the enter key [ENT] is pressed, the change in Trip 2 alarm setpoint is active.	
STEP 11 3.4.4 Press the enter key [ENT]. This value is now displayed under "Trip 2" and the "ENTER" block is cleared. STANDARD: Applicant presses the [ENT] key and verifies the correct value under the "Trip 2" on the display. **This step is critical to input the new Trip 2 setpoint. Again the critical requirement is to have the Trip 2 setpoint set to 9000 CPM by the end of the JPM.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 12 3.5 Press the clear key [CLR] twice to return to the normal display screen. STANDARD: Applicant presses the [CLR] key twice to return to the normal display screen. COMMENTS:	**___ SAT** **___ UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 13 3.6 Enter the new EMF setpoints on the Control Room EMF Setpoint Log. STANDARD: Applicant enters 6300 CPM for trip 1 value and 9000 CPM for trip 2 value on EMF-50L setpoint log sheet. COMMENTS:	___ SAT ___ UNSAT
STEP 14 3.7 Sign the Control Room EMF Setpoint Log in the appropriate box. STANDARD: Applicant signs the EMF Setpoint Log. COMMENTS:	___ SAT ___ UNSAT
STEP 15 3.8 **IF** applicable, document the RP personnel that supplied the setpoints in the Control Room EMF Setpoint Log. STANDARD: Applicant documents that Glenn from RP was the person that supplied the EMF-50L setpoints. COMMENTS: **EXAMINER CUE:** **"Another operator will verify the correct setpoints are entered and finish filling out the setpoint log. This JPM is complete."** **END OF TASK**	___ SAT ___ UNSAT

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
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JPM G

READ TO APPLICANT

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INITIAL CONDITIONS:

- **Unit 1 is at 100% power.**

INITIATING CUES:

Following a discussion with Glenn from RP concerning a premature gaseous release termination, the Control Room Supervisor directs you to set EMF 50L setpoints using OP/0/A/6500/080 (EMF RP86A Output Modules) Enclosure 4.2 (EMF RP86A Trip Setpoint Adjustment) to the following values:

- **Trip 1 = 6300 CPM**
- **Trip 2 = 9000 CPM**

OAC Program EMFLIB is currently not available.

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JPM H

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EVALUATION SHEET

Task: Loss of KC AP-21 step 8 (Reactor Trip Sequence)

Alternate Path: Yes

Facility JPM #: PSS-KC-083

Safety Function: 8 **Title:** Component Cooling Water System

K/A 008 A2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of CCW pump

Rating(s): 3.3 / 3.6 **CFR:** 41.5 / 43.5 / 45.3 / 45.13

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

Simulator **X** In-**P**lant _____ **P**erform **X** **S**imulate _____

References: AP/1/A/5500/021 (Loss of Component Cooling) rev. 42

Task Standard: Aligns steam dumps to pressure mode, trips the reactor and when reactor power is < 5%, trips all NC pumps per AP/1/A/5500/021 (Loss of Component Cooling) step 8.

Validation Time: 5 minutes **Time Critical:** Yes _____ No **X**

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Applicant: Time Start: _____

NAME_____ Docket #_____ Time Finish: _____

Performance Rating: Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____

NAME SIGNATURE DATE

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COMMENTS

Catawba Nuclear Station
JPM H
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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC # 169.**
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.**

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	VLV-KC024F (KC425A Rtn Hdr Cont Isol Outside VLV Fail To Position)	**0**				
	Perform actions of AP-21 up to step 8.					

Catawba Nuclear Station
JPM H
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READ TO APPLICANT

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INITIAL CONDITIONS:

- **Unit 1 is at 100% power.**
- **AP/1/A/5500/021 (Loss of Component Cooling) has been entered.**

INITIATING CUES:

- **The CRS instructs you to perform step 8 of AP/1/A/5500/021.**

EXAMINER NOTE: After reading cue, provide the applicant with a copy of AP/1/A/5500/021 (Loss of Component Cooling) completed through step 7.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

CAUTION A loss of KC cooling to the NC pumps results in a gradual approach to an overheated condition in approximately 10 minutes which will result in shaft seizure.	
STEP 1 8. Verify KC flow to NC pumps as follows: • 1AD-20, A/1 "KC SUPPLY HDR FLOW TO NCP BRGS LOW" – DARK • 1AD-21, A/1 "KC SUPPLY HDR FLOW TO NCP BRGS LOW" - DARK STANDARD: Applicant determines that the listed alarms are lit and transitions to the RNO. COMMENTS:	**___ SAT** **___ UNSAT**

STEP 2 8.RNO.a. Ensure the following valves – OPEN: • 1KC-425A (NC Pumps Ret Hdr Cont Isol) • 1KC-338B (NC Pumps Sup Hdr Cont Isol) • 1KC-424B (NC Pumps Ret Hdr Cont Isol) STANDARD: Applicant determines the red OPEN lights lit and green CLSD lights dark for 1KC-338B & 1KC-424B. Applicant determines that the green CLSD light is lit for 1KC-425A and depresses the red OPEN pushbutton. Applicant determines that 1KC-425A will not open. COMMENTS:	**___ SAT** **___UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3 8.RNO.b. **IF AT ANY TIME** any of the following conditions are met: • Time since loss of KC – GREATER THAN 10 MINUTES **OR** • Any NC pump trip criteria from Enclosure 1 (Foldout Page) is met **THEN** perform the following: **EXAMINER CUE: "Loss of KC occurred greater than 10 minutes ago."** STANDARD: Applicant determines that it has been > 10 minutes since loss of KC per examiner cue and continues with step b.1) of the RNO. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 4 8.RNO.b.1) **IF** letdown is isolated, **THEN** perform the following: STANDARD: Applicant determines that letdown is in service and that this step is N/A. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 5 8.RNO.b.2) Ensure steam dumps – IN PRESSURE MODE. STANDARD: Applicant places steam dump select switch to "PRESS". **This step is critical to ensure proper temperature control following trip of the NC pumps in subsequent steps.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 6 8.RNO.b.3) Ensure the Reactor – TRIPPED. STANDARD: Applicant rotates the reactor trip breaker pistol grips counter-clockwise to the trip position. **EXAMINER CUE: If the applicant starts to perform actions to verify reactor trip, give the following cue – "Another operator will perform the immediate actions of E-0."** **This step is critical to ensure reactor power is < 5% prior to tripping the NC pumps in subsequent steps.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 7 8.RNO.b.4) **WHEN** reactor power less than 5%, **THEN** perform the following: a) Trip all NC pumps. b) Ensure normal spray valve associated with tripped NC pump(s) – IN MANUAL AND CLOSED STANDARD: Applicant depresses the green OFF pushbutton for NC pumps 1A, 1B, 1C, and 1D and verifies the green OFF light lit and red ON light dark for each NC pump. Applicant will depress the [M] button on 1NC-27 & 1NC-29 controllers and depress the [↓] demand pushbutton on each valve until the demand is reading 0%. **This step is critical to protect the NC pumps from failure due to a loss of cooling water supply. It is also critical to place the normal spray valves in manual and closed to align the system for future option of using NV aux spray for NC system pressure reduction.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 8 8.RNO.b.5) Secure any dilutions in progress. STANDARD: Applicant determines that no dilutions are in progress and continues to the next step. COMMENTS:	**___ SAT** **___ UNSAT**

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JPM H
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STEP/STANDARD	SAT/UNSAT
STEP 9 8.RNO.b.6) **IF** reactor trip breakers were closed, **THEN** perform one of the following while continuing with this procedure as time and conditions allow: • **IF** above P-11, **THEN GO TO** EP/1/A/5000/E-0 (Reactor Trip or Safety Injection) OR • **IF** below P-11, **THEN GO TO** AP/1/A/5500/005 (Reactor Trip or Inadvertent S/I Below P-11) STANDARD: Applicant determines the need to go to E-0. **EXAMINER CUE: "The CRS has pulled E-0 and another RO will perform the immediate actions of E-0. This JPM is complete."** COMMENTS: **END OF TASK**	**___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
May 2015 NRC Initial License Exam
JPM H

READ TO APPLICANT

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INITIAL CONDITIONS:

- **Unit 1 is at 100% power.**
- **AP/1/A/5500/021 (Loss of Component Cooling) has been entered.**

INITIATING CUES:

- **The CRS instructs you to perform step 8 of AP/1/A/5500/021.**

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EVALUATION SHEET

Task: Place 1B Hydrogen Recombiner in Service

Alternate Path: No

Facility JPM #: VX-025

Safety Function: 5 **Title:** Hydrogen Recombiner and Purge Control System

K/A 028 A2.01 Malfunctions or operations on the HRPS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Hydrogen Recombiner power setting, determined by using plant data book

Rating(s): 3.4 / 3.6 **CFR:** 41.5 / 43.5 / 45.3 / 45.13

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

Simulator _____ In-**P**lant **X** **P**erform _____ **S**imulate **X**

References: OP/1/A/6450/010 (Containment Hydrogen Control Systems) rev. 43, Enclosure 4.10 (Operation of the Hydrogen Recombiners Following a LOCA)
Unit 1 Revised Data Book, Figure 10

Task Standard: Hydrogen Recombiner 1B in service with Power Adjust "POT" set to approximately 58 KW per Figure 10 of the Unit 1 Revised Data Book.

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

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

Performance Rating: Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

Catawba Nuclear Station
JPM I
May 2015 NRC Exam

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 LOCA has occurred on Unit 1.**

INITIATING CUES:

- **The CRS instructs you to place Hydrogen Recombiner 1B in service at the required power per OP/1/A/6450/010 (Containment Hydrogen Control Systems), Enclosure 4.10 (Operation of the Hydrogen Recombiners Following a LOCA), steps 3.1 through 3.3.14.**
- **All initial conditions are complete.**
- **Containment pressure is 4.3 psig.**
- **Containment hydrogen concentration is 5% as indicated on 1MC-7.**
- **Hydrogen Recombiner 1A is tagged for maintenance.**

EXAMINER NOTE: After reading cue, provide the applicant with a copy of OP/1/A/6450/010 rev. 43, Enclosure 4.10 signed off through step 2.2. The copy of Unit 1 Revised Data Book Figure 10 will be given to the applicant when step 3.3.12.1 is being performed.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1 3.1 Ensure the H2 Skimmer Fans running per Enclosure 4.13 (Emergency Manual Operation of the H2 Skimmer Fans) **EXAMINER CUE**: **"Hydrogen Skimmer Fans 1A & 1B are running per Enclosure 4.13."** STANDARD: Applicant acknowledges cue and signs off the step. COMMENTS:	**___ SAT** **___ UNSAT**

CAUTION: Hydrogen Recombiners are NOT operated with hydrogen concentration ≥ 6% without TSC approval.

NOTE: 1. If desired to place both Hydrogen Recombiners in service, Steps 3.2 and 3.3 may be performed in conjunction.
2. If desired to place both Hydrogen Recombiners in service, use additional Enclosure 4.11 (Hydrogen Recombiner Heater Temperature Log).
3. Placing Hydrogen Recombiner 1A in service is preferred for ALARA consideration.

STEP 2 3.2 **IF** placing Hydrogen Recombiner 1A in service, perform the following at 1ELCP0139 (1A Hydrogen Recombiner Control Panel) (AB-577, DD-52, Rm 494): STANDARD: Applicant determines that per the cue sheet, Hydrogen Recombiner 1A is tagged out for maintenance, and that this step is N/A. COMMENTS:	**___ SAT** **___UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3 3.3 **IF** placing Hydrogen Recombiner 1B in service, perform the following at 1ELCP0140 (1B Hydrogen Recombiner Control Panel) (AB-560, DD-52, Rm 370): 3.3.1 Ensure the "POWER OUT SWITCH" is in the "OFF" position. STANDARD: Applicant locates the Power Out Switch and ensures it is in the OFF position. **EXAMINER CUE: "The "POWER OUT SWITCH" is in the "OFF" position."** COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 4 3.3.2 Ensure the "POWER ADJUST" potentiometer is set to zero (000). STANDARD: Applicant verifies the "POWER ADJUST" potentiometer is set to 000. **EXAMINER CUE: "The "POWER ADJUST" pot is set to zero (000)."** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 5 3.3.3 **IF** the "POWER IN AVAILABLE" light is DARK, ensure 1EMXL-F07C (1B Electric Hydrogen Recombiner Power Supply Panel) (AB-560, BB-47) is in the "ON" position. **EXAMINER CUE**: "The "POWER IN AVAILABLE" light is lit." STANDARD: Applicant determines that with the POWER IN AVAILABLE light being lit, this step is N/A. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 6 3.3.4 Place the "POWER OUT SWITCH" in the "ON" position. **EXAMINER CUE:** After applicant describes placing the POWER OUT SWITCH up to the ON position, "The POWER OUT SWITCH is in the "ON" position." STANDARD: Applicant places the POWER OUT SWITCH up to the ON position. **This step is critical to place the hydrogen recombiner in service.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 7 3.3.5 Verify that the red indicating light is lit. **EXAMINER CUE**: After finding the indicating light on the switch plate inform the applicant - "The RED light on the switch plate is lit." STANDARD: Applicant finds the red indicating light on the switch plate and verifies that it is lit. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 8 3.3.6 Slowly turn the "POWER ADJUST" potentiometer clockwise until 5 KW is indicated on the "POWER OUT" meter. **EXAMINER CUE:** After explaining operation of the potentiometer in the clockwise direction, inform applicant – "The POWER OUT meter rises to 5 KW". STANDARD: Applicant describes turning the potentiometer clockwise to increase the POWER OUTPUT meter reading to 5 KW. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 9 3.3.7 Maintain a 5 KW output for 10 minutes. **EXAMINER CUE**: "Using time compression, 10 minutes has elapsed." STANDARD: Applicant describes maintaining this power output for 10 minutes. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 10 3.3.8 Slowly advance the "POWER ADJUST" setting until an output of 10 KW is obtained on the "POWER OUT" meter. **EXAMINER CUE**: After explaining the operation of the potentiometer in the clockwise direction inform applicant - "The POWER OUT meter rises to 10 KW." STANDARD: Applicant describes turning the potentiometer clockwise to increase the POWER OUTPUT meter reading to 10 KW. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 11 3.3.9 Maintain a 10 KW output for 10 minutes. **EXAMINER CUE**: "Using time compression, 10 minutes has elapsed." STANDARD: Applicant describes maintaining this power output for 10 minutes. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 12 3.3.10 Advance the "POWER ADJUST" setting until an output of 20 KW is obtained on the "POWER OUT" meter. **EXAMINER CUE**: After explaining the operation of the potentiometer in the clockwise direction inform applicant - "The POWER OUT meter rises to 20 KW." STANDARD: Applicant describes turning the potentiometer clockwise to increase the POWER OUTPUT meter reading to 20 KW. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 13 3.3.11 Maintain a 20 KW output for 5 minutes. **EXAMINER CUE**: "Using time compression, 5 minutes has elapsed." STANDARD: Applicant describes maintaining this power output for 5 minutes. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 14 3.3.12 Determine Hydrogen Recombiner 1B power setting as follows: 3.3.12.1 Determine KW value from Figure 10 of the Unit 1 Revised Data Book. **EXAMINER NOTE: The copy of Unit 1 Revised Data Book should be given to the applicant at this time.** STANDARD: Applicant determines that the KW value from Figure 10 is 54 KW. **This step is critical in determining the proper power setting for the given containment conditions.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 15 3.3.12.2 H_2 concentration (1MC-7) _____ % STANDARD: Applicant determines from cue sheet that hydrogen concentration is 5%. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 16 3.3.12.3 **IF** H_2 concentration is > 3.5%, add 4 KW to calculation. STANDARD: Applicant determines that H2 concentration is > 3.5% and adds 4 KW to the calculation. **This step is critical in determining the proper power setting for the given containment conditions.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 17 3.3.12.4 Calculate KW as follows: 54 (Step 3.3.12.1) + 4 (Step 3.3.12.3 or N/A) = 58 KW STANDARD: Applicant calculates the required power setting to be 58 KW. **This step is critical in determining the proper power setting for the given containment conditions.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 18 3.3.13 Advance the "POWER ADJUST" setting until the "POWER OUT" meter indicates the value calculated in 3.3.12.4. Adjust "POWER ADJUST" as necessary to maintain this output. **EXAMINER CUE**: After explaining the operation of the potentiometer in the clockwise direction inform applicant - "The POWER OUT meter rises to 58 KW." STANDARD: Applicant describes turning the potentiometer clockwise to increase the POWER OUTPUT meter reading to 58 KW. **This step is critical to set the necessary power output setting for the given containment conditions.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 19 3.3.14 Notify the NCO that Hydrogen Recombiner 1B is now in service. Person notified _____ STANDARD: Applicant calls the control room and notifies them that 1B Hydrogen Recombiner is in service. **EXAMINER CUE**: "Unit 1 Control Room, this is Greg." Repeat any additional information given. COMMENTS: **END OF TASK**	**___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
May 2015 NRC Initial License Exam
JPM I

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 LOCA has occurred on Unit 1.**

INITIATING CUES:

- **The CRS instructs you to place Hydrogen Recombiner 1B in service at the required power per OP/1/A/6450/010 (Containment Hydrogen Control Systems), Enclosure 4.10 (Operation of the Hydrogen Recombiners Following a LOCA), steps 3.1 through 3.3.14.**
- **All initial conditions are complete.**
- **Containment pressure is 4.3 psig.**
- **Containment hydrogen concentration is 5% as indicated on 1MC-7.**
- **Hydrogen Recombiner 1A is tagged for maintenance.**

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EVALUATION SHEET

Task: Locally Start 2B Diesel Generator

Alternate Path: Yes

Facility JPM #: DG3-008

Safety Function: 6 **Title:** Emergency Diesel Generators

K/A 064 A2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure modes of water, oil, and air valves

Rating(s): 3.1 / 3.3 **CFR:** 41.5 / 43.5 / 45.3 / 45.13

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

Simulator _____ In-**P**lant **X** **P**erform _____ **S**imulate **X**

References: AP/2/A/5500/007 (Loss of Normal Power) rev. 72, Enclosure 11 (Energizing 2ETB From 2B D/G)

Task Standard: 2B D/G is started locally; then secured due to inability to align cooling water supply.

Validation Time: 17 minutes **Time Critical:** Yes _____ No **X**

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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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JPM J
May 2015 NRC Exam

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 has experienced a loss of all AC power to 2ETB.**
- **The reason for the loss of AC power has been corrected.**
- **The 2ETB load shed is complete.**

INITIATING CUES:

- **The CRS instructs you to energize 2ETB from 2B D/G by performing AP/2/A/5500/007 (Loss of Normal Power) Enclosure 11 (Energizing 2ETB From D/G).**

EXAMINER NOTE: After reading cue, provide the applicant with a copy of AP/2/A/5500/007 rev. 72, Enclosure 11.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1 1. **Obtain the following:** • Key #757 (2A/2B D/G Test Start Switch) from WCC Key locker • Flashlight. **EXAMINER CUE**: **"Key and flashlight have been obtained."** STANDARD: Applicant describes getting key #757 from the WCC key locker and obtaining a flashlight. COMMENTS:	**___ SAT** **___ UNSAT**

STEP 2 2. **Do not continue in this enclosure until notified that load shed of 2ETB is complete.** STANDARD: Applicant determines from initial conditions that 2ETB load shed is complete and continues with the procedure. COMMENTS:	**___ SAT** **___UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 3 3. **Start D/G 2B as follows:** a. Notify Control Room Operator to place "D/G 2B CTRL LOCATION" switch on 2MC-11 in "LOCAL" position. STANDARD: Applicant calls the control room operator and directs placing the D/G 2B CONTROL LOCATION switch to the LOCAL position. **EXAMINER CUE: "D/G 2B CTRL LOCATION SWITCH is in the LOCAL position."** **This step is critical to be able to start 2B D/G locally and gain control of the D/G output breaker to tie 2B D/G to 2ETB.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 4 3.b. **IF** unable to transfer diesel to Local Control, **THEN** actuate "CONTROL ROOM OVERRIDE" at breakglass station on 2DGCPB. STANDARD: Applicant determines that per previous examiner cue that this step is N/A. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 5 3.c. Place key in "MANUAL TEST START" keyswitch and turn to "START" position. **EXAMINER CUE: After describing inserting the key and rotating switch to the START position, notify applicant - "The 2B D/G has started and is coming up to operating speed."** STANDARD: Applicant describes inserting key #757 into the MANUAL TEST START keyswitch and rotating it clockwise to the START position. **This step is critical to start the D/G to meet the task given for this JPM.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 6 3.d. Ensure "SPEED CONTROL" is adjusted to obtain frequency of between 58.8 and 61.2 Hz. **EXAMINER CUE: When frequency meter is found, inform applicant – "Frequency is 60 Hz."** STANDARD: Applicant finds the frequency meter and verifies that frequency is in the required band. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 7 3.e. Ensure "VOLTAGE CONTROL" is adjusted to obtain "D/G VOLTAGE" between 4160 and 4600 Volts. **EXAMINER CUE**: **When voltage meter is found, inform applicant – "Voltage is 4100 Volts."** STANDARD: Applicant finds the D/G voltage meter and when discovering that voltage is low, will describe depressing the VOLTAGE RAISE pushbutton to increase D/G voltage. **EXAMINER CUE: After applicant describes depressing the VOLTAGE RAISE pushbutton, inform them – "D/G Voltage now reads 4200 Volts."** **This step is critical to ensure the D/G is operating at the proper voltage prior to tying it to 2ETB in the following step.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 8 4. **WHEN D/G is running, THEN close "Diesel Generator 2B" breaker.** **EXAMINER CUE: After explaining depressing the RED CLOSE pushbutton on D/G 2B breaker, inform applicant – "D/G 2B breaker RED CLSD light is lit."** STANDARD: Applicant describes depressing the RED CLOSE pushbutton and verifying the RED CLSD indicating light being lit. **This step is critical to meeting the task given in this JPM.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 9 5. **IF D/G breaker will not close, THEN:** STANDARD: Applicant determines from the previous cue that this step is N/A. COMMENTS:	**___ SAT** **___ UNSAT**

STEP 10 6. **Close the following essential load center normal incoming breakers:** • 2ELXB-4B (Normal Incoming Breaker Fed From Xfmr 2ETXB) (AB-560, AA-67, Rm 362) • 2ELXD-4B (Normal Incoming Breaker Fed From Xfmr 2ETXD) (AB-560, AA-68, Rm 362) **EXAMINER CUE**: **After explaining the operation of the Load Center pistol grip clockwise to the CLOSE position, inform applicant – "Breaker is closed."** STANDARD: Applicant describes rotating each breaker pistol grip clockwise to the CLOSE position and verifying the RED indicating light lit for each breaker. **This step is critical to provide power to the D/G cooling water valve, allowing it to open automatically and provide cooling to the D/G.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 11 7. **Ensure RN flow through KD Hx as follows:** a. Verify 2RN-292B (2B D/G Hx Inlet Isol) (D2B-567, AA-76) - OPEN **EXAMINER CUE**: **When applicant finds 2RN-292B and describes verifying the valve indicator needle pointing to the OPEN position, inform them - "Valve indicates CLOSED."** STANDARD: Applicant describes verifying the valve position indicator pointing to the OPEN position. COMMENTS:	**___ SAT** **___ UNSAT**

STEP 12 7.b. **IF** 2RN 292B (2B D/G Hx Inlet Isol) does not open, **THEN** perform the following: 1) Open 2EMXF-F01A (2B Diesel Generator Hx Inlet Isol Motor (2RN-292B)) (D2B-556, CC-75) **EXAMINER CUE**: **When applicant describes the opening of 2EMXF-F01A, inform them – "Breaker is OFF."** STANDARD: Applicant describes inserting the locking tab on 2EMXF-F01A and rotating the breaker counter-clockwise to the OFF position and pulling the locking tab back out. COMMENTS:	**___ SAT** **___ UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 13 7.b.2) OPEN 2RN-292B (2B D/G Hx Inlet Isol). **EXAMINER CUE**: **After applicant describes manually opening 2RN-292B, inform them - "Valve does not move and the position indicator still shows CLOSED."** STANDARD: Applicant describes pulling the declutching lever and rotating the valve handwheel in the counter-clockwise direction. COMMENTS:	**___ SAT** **___ UNSAT**
STEP 14 8. **IF RN flow cannot be established, THEN:** **a. Stop D/G 2B by depressing "STOP" on 2DECPB.** b. Notify Control Room Supervisor of status. c. Return this enclosure to Control Room Supervisor. **EXAMINER CUE: After applicant describes depressing the STOP pushbutton on 2DECPB, inform them – "Diesel Generator is coasting down." Also repeat back any information given to the Control Room Supervisor.** STANDARD: Applicant depresses the STOP pushbutton on 2DECPB and verifies the Diesel Generator is stopped. **The only part of this step that is critical is to stop the 2B D/G. This step is critical to prevent damage to the 2B D/G due to no cooling water being available.** COMMENTS: **END OF TASK**	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
May 2015 NRC Initial License Exam
JPM J

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 has experienced a loss of all AC power to 2ETB.**
- **The reason for the loss of AC power has been corrected.**
- **The 2ETB load shed is complete.**

INITIATING CUES:

- **The CRS instructs you to energize 2ETB from 2B D/G by performing AP/2/A/5500/007 (Loss of Normal Power) Enclosure 11 (Energizing 2ETB From D/G).**

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EVALUATION SHEET

Task: Startup Backup Temporary VI Compressor

Alternate Path: No

Facility JPM #: VI-003

Safety Function: 8 **Title:** Instrument Air System

K/A APE065 AA1.04 Ability to operate and / or monitor the following as they apply to the Loss of Instrument Air: Emergency air compressor

Rating(s): 3.4 / 3.6 **CFR:** 41.7 / 45.5 / 45.6

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

Simulator _____ In-**P**lant **X** **P**erform _____ **S**imulate **X**

References: AP/0/A/5500/022 (Loss of Instrument Air) rev. 35
EP/1/A/5000/G-1 (Unit 1 Generic Control Room Enclosures) rev. 09, Enclosure 23 (Backup VI Compressor(s))

Task Standard: Temporary VI compressor started and aligned to the Instrument Air header through 1VI-417.

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

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

Performance Rating: Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

Catawba Nuclear Station
JPM K
May 2015 NRC Exam

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 1 and 2 are at 100% power.**
- **VI Lo Pressure annunciator is lit.**
- **VI pressure is 75 psig and slowly decreasing.**
- **AP/0/A/5500/022 (Loss of Instrument Air) has been implemented.**

INITIATING CUES:

- **The CRS instructs you to startup and align the Backup Temporary VI compressor #2 to the Instrument Air Header per the local copy of EP/1/A/5000/G-1 (Unit 1 Generic Control Room Enclosures) Enclosure 23 (Backup VI Compressor(s)) step 3.**

EXAMINER NOTE: After applicant locates the local copy, hand them a copy of EP/1/A/5000/G-1 Enclosure 23.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

EXAMINER NOTE: Two Backup VI compressors should be available at any given time. A third backup compressor is stationed at the Catawba garage.
Applicant should select Backup VI Compressor 2 for startup per the initiating cue.
IF Backup Compressor 2 is not available then direct the operator to startup compressor 3 and start the JPM at step 5 (page 14 of this JPM).

STEP 1 3. To Start Backup VI Compressor 2 perform the following: a. Verify engine oil (inside engine side panel) – GREATER THAN "ADD" ON DIPSTICK. **EXAMINER CUE**: **When dipstick is located, inform applicant - "Oil level is greater than "ADD"."** STANDARD: Applicant locates the dipstick and checks the oil level. COMMENTS:	**___ SAT** **___ UNSAT**

STEP 2 3.b. Verify compressor oil level (inside compressor front panel) – VISIBLE IN SIGHTGLASS. **EXAMINER CUE: When sightglass is located, inform applicant – "Oil level is visible in the sight glass (near full)."** STANDARD: Applicant locates sightglass and checks oil level. COMMENTS:	**___ SAT** **___UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3 3.c. **IF** oil levels inadequate, **THEN** inform Control Room. STANDARD: Applicant determines per given cues that this step is N/A. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 4 3.d. Ensure all compressor panel doors – CLOSED **EXAMINER CUE: If asked, inform applicant – "All doors are closed."** STANDARD: Applicant ensures that all compressor panel doors are closed. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 5 3.e. Unplug battery charger power supply cord from the outlet (outside wall at TB 594, 2D-34). **EXAMINER CUE**: **When plug is located, inform applicant – "Battery charger is unplugged."** STANDARD: Applicant locates and describes unplugging the battery charger power supply cord. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 6 3.f. Ensure 1VI-428 (VI Comp B/U2 Disch) – OPEN **EXAMINER CUE: When valve is located and applicant correctly describes opening the valve, inform applicant – "1VI-428 is Open."** STANDARD: Applicant locates and describes the verification of or opening 1VI-428. **This step is critical to ensure a flow path from the compressor discharge to the VI header.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

NOTE The following steps are performed at control panel on front of Backup VI compressor 2.	
STEP 7 3.g. Rotate OFF/ON/START switch to – ON. **EXAMINER CUE: When switch is located, and operation described, inform applicant – "OFF/ON/START switch is in ON."** STANDARD: Applicant locates and describes operation of the OFF/ON/START switch to the ON position. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 8 3.h. **IF** outside temperature less than or equal to 45°F, **THEN** place "HEATERS" toggle switch – "ON". **EXAMINER CUE: If asked, inform applicant – "Outside air temp is currently 87°F."** STANDARD: Applicant determines from the examiner cue that this step is N/A. COMMENTS:	___ **SAT** ___ **UNSAT**

NOTE Fuel level of ½ will provide approximately 3 hours of run time at full load.	
STEP 9 3.i. Verify fuel level – ON SCALE. **EXAMINER CUE**: **When fuel level gage is located, inform applicant – "Fuel oil level is at ¾ mark."** STANDARD: Applicant locates fuel level gage and verifies level is on scale per cue given. COMMENTS:	___ **SAT** ___ **UNSAT**

NOTE OFF/ON/START switch spring returns to ON when released.
OFF/ON/START switch should not be held in the START position for greater than 10 seconds, to prevent starter overheating.

STEP/STANDARD	SAT/UNSAT
STEP 10 3.j. Start Backup VI Compressor 2 as follows: 1) Rotate and hold OFF/ON/START switch to – START. **EXAMINER CUE**: **After explaining the operation of the OFF/ON/START switch, inform applicant – "OFF/ON/START switch is in START."** STANDARD: Applicant describes turning OFF/ON/START switch to the START position. **This step is critical to start the backup VI compressor prior to aligning to supply the instrument air header.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 11 3.j.2) Release OFF/ON/START switch when one of the following occurs: • Engine starts **OR** • 10 seconds has elapsed. **EXAMINER CUE**: **Inform applicant – "The engine is running."** **EXAMINER CUE: Once applicant describes releasing the OFF/ON/START switch, inform applicant – "OFF/ON/START switch has been released."** STANDARD: Applicant describes releasing the OFF/ON/START switch following cue given by examiner. **This step is critical to prevent overheating the engine starter.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 12 3.j.3) **IF** engine failed to start, **THEN** start compressor as follows: STANDARD: Applicant determines from examiner cue in previous step, that this step is N/A. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 13 3.k. **WHEN** compressor has been running for 60 seconds, **THEN** depress "PRESSURE CONTROL" switch. **EXAMINER CUE**: **Inform applicant - "60 seconds have elapsed." When located and operation described, inform applicant – "PRESSURE CONTROL button has been depressed."** STANDARD: Applicant describes depressing the PRESSURE CONTROL button. **This step is critical to ensure compressor discharge pressure is sufficient to supply the Instrument Air header.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 14 3.l. **IF** outside air temperature greater than 32°F, **THEN** ensure "HEATERS" toggle switch – "OFF". **EXAMINER CUE: When located, inform applicant – "HEATER toggle switch is in the OFF position."** STANDARD: Applicant determines that per previous given cue, that this step is applicable and verifies the HEATERS toggle switch is OFF. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 15 3.m. OPEN 1VI 425 (VI Comp B/U2 Manifold Inlet). **EXAMINER CUE: When valve is located and proper operation described, inform applicant – "1VI-425 is Open."** STANDARD: Applicant describes opening 1VI-425. **This step is critical to align proper flow path from the compressor to the Instrument Air header.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 16 3.n. Ensure the following valves OPEN: • 1VI-511 (B/U VI Compressor Air Dryer Bypass) (TB2-598, 2C-34). • 1VI-417 (B/U VI Compressor Header Isol) (TB2-598, 2C-34). **EXAMINER CUE: When valves are located and proper operation to open is described, inform applicant – "1VI-511 is open. 1VI-417 is open."** STANDARD: Applicant describes opening 1VI-511 and 1VI-417. **This step is critical to align a flow path from the backup VI Compressor to the Instrument Air header.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 17 3.o. Record the following: • Compressor start time _____ • HOURMETER _____ • COMP DISH PRESS _____ **EXAMINER CUE: If asked, inform applicant – "Use current run hours, time and discharge pressure is 110 psig."** STANDARD: Applicant records the values for current time, engine run hours, and discharge pressure given in the cue. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 18 3.p. Notify the control room of the following: • Status of backup compressor 2 • **IF** idle compressor available, **THEN** request Control Room Supervisor to evaluate VI header pressure to determine whether additional backup compressor required • **IF** Control Room determines additional backup VI compressor required, **THEN** start idle Backup VI compressor. **EXAMINER CUE**: **Repeat back the information given, then inform applicant – "The CRS has evaluated VI header pressure and an additional backup VI compressor is not needed at this time. The CRS will have the turbine building AO complete the steps. This JPM is complete."** **EXAMINER NOTE: If backup compressor 2 was not available, the following steps will be to align backup compressor 3.** STANDARD: Applicant informs the Control Room of the status of backup compressor 2. COMMENTS:	**___ SAT** **___ UNSAT**

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JPM K
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STEP/STANDARD	SAT/UNSAT
STEP 1 5. To Start Backup VI Compressor 3 perform the following: a. Verify engine oil (inside engine side panel) – GREATER THAN "ADD" ON DIPSTICK. **EXAMINER CUE**: **When dipstick is located, inform applicant - "Oil level is greater than "ADD"."** STANDARD: Applicant locates the dipstick and checks the oil level. COMMENTS:	**___ SAT** **___ UNSAT**
STEP 2 5.b. Verify compressor oil level (inside compressor front panel) – VISIBLE IN SIGHTGLASS. **EXAMINER CUE: When sightglass is located, inform applicant – "Oil level is visible in the sight glass (near full)."** STANDARD: Applicant locates sightglass and checks oil level. COMMENTS:	**___ SAT** **___UNSAT**
STEP 3 5.c. **IF** oil levels inadequate, **THEN** inform Control Room. STANDARD: Applicant determines per given cues that this step is N/A. COMMENTS:	**___ SAT** **___ UNSAT**

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JPM K
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STEP/STANDARD	SAT/UNSAT
STEP 4 5.d. Ensure all compressor panel doors – CLOSED **EXAMINER CUE: If asked, inform applicant – "All doors are closed."** STANDARD: Applicant ensures that all compressor panel doors are closed. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 5 5.e. Unplug battery charger power supply cord from the outlet (outside wall at TB 594, 2D-34). **EXAMINER CUE**: **When plug is located, inform applicant – "Battery charger is unplugged."** STANDARD: Applicant locates and describes unplugging the battery charger power supply cord. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 6 5.f. Ensure 1VI-430 (VI Comp B/U3 Disch) – OPEN **EXAMINER CUE: When valve is located and applicant correctly describes opening the valve, inform applicant – "1VI-430 is Open."** STANDARD: Applicant locates and describes the verification of or opening 1VI-430. **This step is critical to ensure a flow path from the compressor discharge to the VI header.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

NOTE The following steps are performed at control panel on front of Backup VI compressor 3.	
STEP 7 5.g. Rotate OFF/ON/START switch to – ON. **EXAMINER CUE: When switch is located, and operation described, inform applicant – "OFF/ON/START switch is in ON."** STANDARD: Applicant locates and describes operation of the OFF/ON/START switch to the ON position. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 8 5.h. **IF** outside temperature less than or equal to 45°F, **THEN** place "HEATERS" toggle switch – "ON". **EXAMINER CUE: If asked, inform applicant – "Outside air temp is currently 87°F."** STANDARD: Applicant determines from the examiner cue that this step is N/A. COMMENTS:	___ **SAT** ___ **UNSAT**

NOTE Fuel level of ½ will provide approximately 3 hours of run time at full load.	
STEP 9 5.i. Verify fuel level – ON SCALE. **EXAMINER CUE**: **When fuel level gage is located, inform applicant – "Fuel oil level is at ¾ mark."** STANDARD: Applicant locates fuel level gage and verifies level is on scale per cue given. COMMENTS:	___ **SAT** ___ **UNSAT**

NOTE OFF/ON/START switch spring returns to ON when released.
OFF/ON/START switch should not be held in the START position for greater than 10 seconds, to prevent starter overheating.

STEP/STANDARD	SAT/UNSAT
STEP 10 5.j. Start Backup VI Compressor 3 as follows: 1) Rotate and hold OFF/ON/START switch to – START. **EXAMINER CUE**: **After explaining the operation of the OFF/ON/START switch, inform applicant – "OFF/ON/START switch is in START."** STANDARD: Applicant describes turning OFF/ON/START switch to the START position. **This step is critical to start the backup VI compressor prior to aligning to supply the instrument air header.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 11 5.j.2) Release OFF/ON/START switch when one of the following occurs: • Engine starts **OR** • 10 seconds has elapsed. **EXAMINER CUE**: **Inform applicant – "The engine is running."** **EXAMINER CUE: Once applicant describes releasing the OFF/ON/START switch, inform applicant – "OFF/ON/START switch has been released."** STANDARD: Applicant describes releasing the OFF/ON/START switch following cue given by examiner. **This step is critical to prevent overheating the engine starter.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 12 5.j.3) **IF** engine failed to start, **THEN** start compressor as follows: STANDARD: Applicant determines from examiner cue in previous step, that this step is N/A. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 13 5.k. **WHEN** compressor has been running for 60 seconds, **THEN** depress "PRESSURE CONTROL" switch. **EXAMINER CUE**: **Inform applicant - "60 seconds have elapsed." When located and operation described, inform applicant – "PRESSURE CONTROL button has been depressed."** STANDARD: Applicant describes depressing the PRESSURE CONTROL button. **This step is critical to ensure compressor discharge pressure is sufficient to supply the Instrument Air header.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP 14 5.l. **IF** outside air temperature greater than 32°F, **THEN** ensure "HEATERS" toggle switch – "OFF". **EXAMINER CUE: When located, inform applicant – "HEATER toggle switch is in the OFF position."** STANDARD: Applicant determines that per previous given cue, that this step is applicable and verifies the HEATERS toggle switch is OFF. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 15 5.m. OPEN 1VI 426 (VI Comp B/U3 Manifold Inlet). **EXAMINER CUE: When valve is located and proper operation described, inform applicant – "1VI-426 is Open."** STANDARD: Applicant describes opening 1VI-426. **This step is critical to align proper flow path from the compressor to the Instrument Air header.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 16 5.n. Ensure the following valves OPEN: • 1VI-511 (B/U VI Compressor Air Dryer Bypass) (TB2-598, 2C-34). • 1VI-417 (B/U VI Compressor Header Isol) (TB2-598, 2C-34). **EXAMINER CUE: When valves are located and proper operation to open is described, inform applicant – "1VI-511 is open. 1VI-417 is open."** STANDARD: Applicant describes opening 1VI-511 and 1VI-417. **This step is critical to align a flow path from the backup VI Compressor to the Instrument Air header.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 17 5.o. Record the following: • Compressor start time _____ • HOURMETER _____ • COMP DISH PRESS _____ **EXAMINER CUE: If asked, inform applicant – "Use current run hours, time and discharge pressure is 110 psig."** STANDARD: Applicant records the values for current time, engine run hours, and discharge pressure given in the cue. COMMENTS:	**___ SAT** **___ UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 18 5.p. Notify the control room of the following: • Status of backup compressor 3 • **IF** idle compressor available, **THEN** request Control Room Supervisor to evaluate VI header pressure to determine whether additional backup compressor required • **IF** Control Room determines additional backup VI compressor required, **THEN** start idle Backup VI compressor. **EXAMINER CUE**: **Repeat back the information given, then inform applicant – "The CRS has evaluated VI header pressure and an additional backup VI compressor is not needed at this time. The CRS will have the turbine building AO complete the steps. This JPM is complete."** STANDARD: Applicant informs the Control Room of the status of backup compressor 3. COMMENTS: **END OF TASK**	**___ SAT** **___ UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
May 2015 NRC Initial License Exam
JPM K

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 1 and 2 are at 100% power.**
- **VI Lo Pressure annunciator is lit.**
- **VI pressure is 75 psig and slowly decreasing.**
- **AP/0/A/5500/022 (Loss of Instrument Air) has been implemented.**

INITIATING CUES:

- **The CRS instructs you to startup and align the Backup Temporary VI compressor #2 to the Instrument Air Header per the local copy of EP/1/A/5000/G-1 (Unit 1 Generic Control Room Enclosures) Enclosure 23 (Backup VI Compressor(s)) step 3.**