Catawba Nuclear Station
JPM A
May 2014 NRC Initial License Exam

System JPM A

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EVALUATION SHEET

Task: Respond to an inadvertent dilution while shutdown per AP/1/A/5500/013 (Boron Dilution), Case II (Boron Dilution While Shutdown)

Alternate Path: Yes

Facility JPM #: New

Safety Function: 1 **Title:** Chemical and Volume Control System

K/A 004 A2.06 Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS: and based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Inadvertent boration/dilution

Rating(s): 4.2 / 4.3 **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: AP/1/A/5500/013 (Boron Dilution) rev. 24

Task Standard: Starts the 1A NI (Safety Injection) pump.

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 #168.**
3. **Enter the password.**
4. **Select "Yes" on the INITIAL CONDITION RESET pop-up window.**
5. **Ensure simulator setup per table below.**
6. **Place simulator in RUN and acknowledge any alarms.**
7. **ENSURE "Extra Operator" is present in the simulator.**
8. **Place simulator in FREEZE until Examiner cue is given.**

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event
	LOA-NI004 (RACKOUT NI PMP 1B)	RACK OUT				
	LOA-NV067 (RACKOUT NV PMP 1B)	RACK OUT				
	LOA-NV066 (RACKOUT NV PMP 1A)	RACK OUT				2
	Ensure EVENT 2 = x10i167c (NV-353 & 364 MIXED BED DEMIN 1A ISOL "CLOSE" pushbutton)					

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

Unit 1 is in MODE 5
Unit 1 RMWST is aligned for VCT makeup.

INITIATING CUES:

- **A boron dilution event is in progress, you have been instructed to perform AP/1/A/5500013 (Boron Dilution), Case II (Boron Dilution While Shutdown).**

EXAMINER NOTE: After reading cue, provide the applicant with a copy of AP/1/A/5500/013

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 1. **Verify boron dilution event - IN PROGRESS.** STANDARD: Applicant determines a boron dilution event is in progress per the initiating cue. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 2 **Verify Reactor Trip:** • All rod bottom lights - LIT • All reactor trip and bypass breakers - OPEN. STANDARD: Applicant verifies the reactor is tripped by verifying all rod bottom lights are lit on the DRPI monitors and that the green OPEN lights are lit for RX TRIP BKR 1A and RX TRIP BKR 1B on 1MC-1. COMMENTS:	___ **SAT** ___**UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3 3. **Verify core alterations - IN PROGRESS.** STANDARD: Applicant verifies that core alterations are NOT because the unit is in MODE 5 and proceeds to the RNO. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 4 3. RNO **GO TO Step 5.** STANDARD: Applicant proceeds to step 5 COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 5 5. **Evacuate personnel from reactor building using the following:** • Containment evacuation alarm • Plant page. STANDARD: Applicant depresses the red ON pushbutton for the UNIT 1 CONT EVAC ALARM on 1MC-1 and makes a plant page. **This step is critical to perform either action to protect the health and safety of the people working inside containment.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 6 6. **Stop any dilutions in progress as follows:** a. Place "NC MAKEUP CONTROL" switch to "STOP". STANDARD: Applicant places the “NC MAKEUP CONTROL” to the STOP position 1MC-10. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 7 6. b. Verify Unit 1 RMWST aligned for VCT makeup. STANDARD: Applicant verifies the Unit 1 RMWST is aligned per the initial conditions. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 8 6. c. Place both reactor makeup water pumps to "OFF". STANDARD: Applicant places RX M/U WTR PUMP 1A and RX M/U WTR PUMP 1B to the “OFF” position on 1MC-10. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 9 6. d. Isolate the NV demineralizers as follows: 1) Place 1NV-153A (Letdn Hx Otlt 3-Way Valve) in the "VCT" position. STANDARD: Applicant places 1NV-153A in the “VCT” position on 1MC-10. **This step is critical to prevent un-saturating the Mixed Bed Demineralizers.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 10 6. d. 2) Ensure the following valves - CLOSED: • 1NV-353 & 364 (Mixed Bed Demin 1A Isol) • 1NV-368 & 379 (Mixed Bed Demin 1B Isol). STANDARD: Applicant depresses the green CLOSE pushbutton for NV-353 & 364 MIXED BED DEMIN 1A ISOL and verifies the green CLSD light is lit for NV-368 & 379 MIXED BED DEMIN 1A ISOL on 1MC-10. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
NOTE Unit shutdown alignments may have established alternate boration flowpaths. STEP 11 7. **Ensure proper BDMS operation as follows:** a. Verify at least one of the following alarm(s) - LIT: • 1AD-2, E/2 "TRAIN A SHUTDOWN MARGIN ALARM" OR • 1AD-2, F/2 "TRAIN B SHUTDOWN MARGIN ALARM". STANDARD: Applicant verifies at least one of the alarms is lit. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 12 7. b. 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 are lit for 1NV-252A and 1NV-253B on 1MC-10. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 13 7. c. Ensure the following valves - CLOSED: • 1NV-188A (VCT Otlt Isol) • 1NV-189B (VCT Otlt Isol). STANDARD: Applicant verifies that the green CLSD lights are lit for 1NV-188A and 1NV-189B on 1MC-10. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 14 7. d. Verify NV pump - ON. STANDARD: Applicant determines that no NV pumps are on and proceeds to the RNO. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 15 7. d. RNO d. Perform the following: 1) **IF** NV pump 1A **AND** 1B boration flowpath **NOT** available, **THEN GO TO** Enclosure 1 (NI or ND Pump Boron Injection Alignment). STANDARD: Applicant proceeds to Enclosure 1. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
Enclosure 1 STEP 16 1. **Align NC system boration flowpath as follows:** a. **IF** establishing NC system boration, **THEN GO TO** Step 2. STANDARD: Applicant proceeds to step 2. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 17 2. **Initiate NC system boration flow as required using at least one of the following boration flowpaths.** • **IF** NI Pump 1A aligned to provide boron injection flowpath, **THEN** perform the following to establish NI Pump 1A injection flow: a. Ensure 1NI-118A (NI Pump 1A C-Leg Inj Isol) - OPEN. STANDARD: Applicant verifies that the red OPEN light is lit for 1NI-118A on 1MC-11 COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 18 b. START NI Pump 1A. STANDARD: Applicant depresses the red ON pushbutton for NI PMP 1A. **This step is critical to initiate NC system boration flow.** **NOTE TO EXAMINER: No other flow paths will be aligned.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 19 3. **WHEN NC system boration no longer required, THEN perform Step 5.** STANDARD: Applicant acknowledges step. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 20 4. **GO TO Case II (Boron Dilution While Shutdown), Step 9.** STANDARD: Applicant proceeds to Case II, Step 9. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
NOTE A time delay of up to 3-5 minutes can be expected before indication of negative reactivity insertion is obtained on excore instrumentation. STEP 21 9. **Verify neutron flux level - STABLE OR DECREASING.** STANDARD: Applicant reads the step. **Examiner Cue: "Another operator will complete the procedure."** COMMENTS: **END OF TASK**	___ **SAT** ___ **UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
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JPM A

READ TO APPLICANT

DIRECTION TO APPLICANT:

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INITIAL CONDITIONS:

Unit 1 is in MODE 5
Unit 1 RMWST is aligned for VCT makeup.

INITIATING CUES:

- **A boron dilution event is in progress, you have been instructed to perform AP/1/A/5500013 (Boron Dilution), Case II (Boron Dilution While Shutdown).**

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JPM B

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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)

Task Standard: EP/1/A/5000/ES-1.3 Transfer to Cold Leg Recirculation) step 6 is performed. The FWST is isolated with the NV (Chemical Volume and Control System) and NI (Safety Injection System) pumps aligned and injecting from the 1A ND (Residual Heat Removal System) pump. The 1B ND (Residual Heat Removal System) pump is shutdown.

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 B
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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-NI037F (NI184B CNMT SUMP LINE 1B ISOL (STEM) FAIL TO POSITION)	**0**				
	MAL-NC013A (NC COLD LEG A LEAK)	**27.5**				

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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. STEP 2 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 and 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. **This step is critical align the suction flow path for the NI (Safety Injection System) pumps to the discharge of the 1A ND (Residual Heat Removal System) pump.** **Examiner NOTE: Only one of the valves needs to be open to satisfy the critical step because the valves are in parallel.** COMMENTS:	**CRITICAL STEP** ___ **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 **This step is critical align the suction flow path for the NV (Chemical Volume and Control System) pumps to the discharge of the 1A ND (Residual Heat Removal System) pump.** COMMENTS:	**CRITICAL STEP** ___ **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 that the 1A ND pump is running and 1ND-28A is open and proceeds to the next step. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 18 k. Isolate FWST from NV and NI pumps as follows: 1) Place "PWR DISCON FOR 1NI-100B" switch in "ENABLE". STANDARD: Applicant places the “PWR DISCON FOR 1NI-100B” switch to “ENABLE” on 1MC-11. **This step is critical to allow operation of 1N-100B** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP 19 2) CLOSE 1NI-100B (NI Pmps Suct From FWST). STANDARD: Applicant depresses the green CLOSE pushbutton for 1NI-100B on 1MC-11. **This step is critical to isolate the NI (Safety Injection System) pumps suction from the FWST.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 20 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. **This step is critical to isolate the NV (Chemical Volume and Control System) pumps suction from the FWST.** 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 B

READ TO APPLICANT

DIRECTION TO APPLICANT:

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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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System JPM C

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EVALUATION SHEET

Task: Perform PT/1/A/4200/023B (NC PORV and Air Supply Stroke Test), Enclosure 13.4 (NC PORV Cycle)

Alternate Path: No

Facility JPM #: New

Safety Function: 3 **Title:** Pressurizer Pressure Control

K/A 010 A4.03 Ability to manually operate and/or monitor in the control room: PORV and block valves

Rating(s): 4.0 / 3.8 **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: PT/1/A/4200/023B (NC PORV and Air Supply Stroke Test), Enclosure 13.4 (NC PORV Cycle) rev. 017

Task Standard: Enclosure 13.4 successfully completed with all valves returned to the as found position.

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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JPM C
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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC #170**
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

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

Unit 1 is in MODE 3.

INITIATING CUES:

- **The Control Room Supervisor instructs you to perform PT/1/A/4200/023B, Enclosure 13.4 for all of the Pzr PORVs.**

EXAMINER NOTE: After reading cue, provide the applicant with a copy of PT/1/A/4200/023B, Enclosure 13.4.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 1.1 **IF** testing 1NC-32B (Pzr PORV), perform the following: 1.1.1 Record the as found position of 1NC-31B (Pzr PORV Isol) below: _____ STANDARD: Applicant records OPEN as the as found position. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 2 1.1.2 Ensure 1NC-31B (Pzr PORV Isol) is closed. STANDARD: Applicant places the switch for 1NC-31B to the CLOSE or OVERRIDE position. **This step is critical to prevent a pressure transient when 1NC-32B is opened.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___**UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3 1.1.3 Record the as found position of 1NC-32B (Pzr PORV) below: _____ STANDARD: Applicant records CLOSED as the as found position for 1NC-32B COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 4 1.1.4 Circle below the as found switch position of 1NC-32B (Pzr PORV). Close Open Auto STANDARD: Applicant circles Auto as the as found switch position of 1NC-32B. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 5 1.1.5 Ensure 1NC-32B (Pzr PORV) is closed. STANDARD: Applicant determines that 1NC-32B is closed. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 6 1.1.6 Cycle 1NC-32B (Pzr PORV) from closed to open to closed from the control room. STANDARD: Applicant places the switch for 1NC-32B to the OPEN position and then to the AUTO or CLOSE position. **This step is critical to cycle 1NC-32B.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 7 1.1.7 Return 1NC-32B (Pzr PORV) to the as found position, as recorded in Step 1.1.3 of this enclosure. STANDARD: Applicant determines that 1NC-32B is in the as found position as recorded in step 1.1.3. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 8 1.1.8 Return switch for 1NC-32B (Pzr PORV) to the as found position, as recorded in Step 1.1.4 of this enclosure. STANDARD: Applicant places the switch for 1NC-32B to the AUTO position. **This step is critical to return the switch for 1NC-32B to the as found position.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 9 1.1.9 Return 1NC-31B (Pzr PORV Isol) to the as found position, as recorded in Step 1.1.1 of this enclosure. STANDARD: Applicant places the switch for 1NC-31B to the OPEN position. **This step is critical to return 1NC-31B to the as found position and make 1NC-32B available for pressure relief.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 10 1.2 **IF** testing 1NC-34A (Pzr PORV), perform the following: 1.2.1 Record the as found position of 1NC-33A (Pzr PORV Isol) below: _____ STANDARD: Applicant records OPEN as the as found position for 1NC-33A COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 11 1.2.2 Ensure 1NC-33A (Pzr PORV Isol) is closed. STANDARD: Applicant places the switch for 1NC-33A to the CLOSE or OVERRIDE position. **This step is critical to prevent a pressure transient when 1NC-34A is opened.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 12 1.2.3 Record the as found position of 1NC-34A (Pzr PORV) below: _____ STANDARD: Applicant records CLOSED for the as found position for 1NC-34A. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 13 1.2.4 Circle below the as found switch position of 1NC-34A (Pzr PORV). Close Open Auto STANDARD: Applicant circles Auto as the as found switch position of 1NC-34A. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 14 1.2.5 Ensure 1NC-34A (Pzr PORV) is closed. STANDARD: Applicant determines that 1NC-34A is closed. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 15 1.2.6 Cycle 1NC-34A (Pzr PORV) from closed to open to closed from the control room. STANDARD: Applicant places the switch for 1NC-34A to the OPEN position and then to the AUTO or CLOSE position. **This step is critical to cycle 1NC-34A.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 16 1.2.7 Return 1NC-34A (Pzr PORV) to the as found position, as recorded in Step 1.2.3 of this enclosure. STANDARD: Applicant determines that 1NC-34A is in the as found position as recorded in step 1.2.3. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 17 1.2.8 Return switch for 1NC-34A (Pzr PORV) to the as found position, as recorded in Step 1.2.4 of this enclosure. STANDARD: Applicant places the switch for 1NC-34A to the AUTO position **This step is critical to return the switch for 1NC-34A to the as found position.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 18 1.2.9 Return 1NC-33A (Pzr PORV Isol) to the as found position, as recorded in Step 1.2.1 of this enclosure. STANDARD: Applicant places the switch for 1NC-33A to the OPEN position. **This step is critical to return 1NC-33A to the as found position and make 1NC-34A available for pressure relief.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 19 1.3 **IF** testing 1NC-36B (Pzr PORV), perform the following: 1.3.1 Record the as found position of 1NC-35B (Pzr PORV Isol) below: _____ STANDARD: Applicant records OPEN as the as found position for 1NC-35B. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 20 1.3.2 Ensure 1NC-35B (Pzr PORV Isol) is closed. STANDARD: Applicant places the switch for 1NC-35B to the CLOSE position. **This step is critical to prevent a pressure transient when 1NC-36B is opened.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 21 1.3.3 Record the as found position of 1NC-36B (Pzr PORV) below: _____ STANDARD: Applicant records CLOSED as the as found position for 1NC-36B. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 22 1.3.4 Circle below the as found switch position of 1NC-36B (Pzr PORV). Close Open Auto STANDARD: Applicant circles AUTO as the as found switch position of 1NC-36B COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 23 1.3.5 Ensure 1NC-36B (Pzr PORV) is closed. STANDARD: Applicant determines that 1NC-36B is closed. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 24 1.3.6 Cycle 1NC-36B (Pzr PORV) from closed to open to closed from the control room. STANDARD: Applicant places the switch for 1NC-36B to the OPEN position and then to the AUTO or CLOSE position. **This step is critical to cycle 1NC-36B.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 25 1.3.7 Return 1NC-36B (Pzr PORV) to the as found position, as recorded in Step 1.3.3 of this enclosure. STANDARD: Applicant determines that 1NC-36B is in the as found position as recorded in step 1.3.3. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 26 1.3.8 Return switch for 1NC-36B (Pzr PORV) to the as found position, as recorded in Step 1.3.4 of this enclosure. STANDARD: Applicant places the switch for 1NC-36B to the AUTO position. **This step is critical to return the switch for 1NC-36B to the as found position.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 27 1.3.9 Return 1NC-35B (Pzr PORV Isol) to the as found position, as recorded in Step 1.3.1 of this enclosure. STANDARD: Applicant places the switch for 1NC-35B to the OPEN position. **This step is critical to return 1NC-35B to the as found position and to make 1NC-36B available for pressure relief.** COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

Unit 1 is in MODE 3.

INITIATING CUES:

- **The Control Room Supervisor instructs you to perform PT/1/A/4200/023B, Enclosure 13.4 for all of the Pzr PORVs.**

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System JPM D

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EVALUATION SHEET

Task: Start Reactor Coolant Pump 1B

Alternate Path: Yes

Facility JPM #: NCP081 (modified)

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

K/A 003 A1.01 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS control including: RCP vibration.

Rating(s): 2.9 / 2.9 **CFR:** 41.5 / 45.5

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

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

References: OP/1/A/6150/002A (Reactor Coolant Pump) rev. 068

Task Standard: 1B Reactor Coolant Pump is tripped when vibration is noted to be greater than NC pump trip criteria.

Validation Time: 20 minutes **Time Critical:** Yes _____ No **X**

==========

Applicant: Time Start: _____

NAME_____ Docket #_____ Time Finish: _____

Performance Rating: Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____

NAME SIGNATURE DATE

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COMMENTS

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1. Reset to any 100% power IC set.

2. Manually trip the reactor at 1MC-1.

3. Trip all (4) four NCP breakers at 1MC-10.

4. Place CF pump in service for auto S/G level control and secure CA.

5. Insert MAL-NCP005FXB (NCP VIB B MOUNT HORIZ FAILURE) Initial =0 Ramp =240 Value=10, EVENT =1, Delay = 5

6. Insert MAL-NCP005FYB (NCP VIB B MOUNT VERT FAILURE) Initial =0 Ramp =240 Value=10, EVENT =1, Delay = 5

7. Insert MAL-NCP005SXB (NCP VIB B MOUNT HORIZ FAILURE) Initial =0 Ramp =120 Value=30, EVENT =1, Delay = 5

8. Insert MAL-NCP005SYB (NCP VIB B MOUNT VERT FAILURE) Initial =0Ramp =120 Value=30, EVENT =1, Delay = 5

9. Insert EVENT 1 = x10d185M >400 (NCP B AMPS>400)

10. Freeze simulator and write to a snap.

IC SELECTED:

SIMULATOR OPERATOR INSTRUCTIONS:

ENSURE BENTLEY NEVADA VIBRATION MONITORS ON BACK BOARD ARE RESET AND THAT ALARMS 1AD-6 A/5 AND B/5 ARE CLEARED BETWEEN STUDENTS.

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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC #171**
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-NCP005FXB (NCP VIB 1B MOUNT HORZ FAILURE)	10	5	4 MIN		1
	MAL-NCP005FYB (NCP VIB 1B MOUNT VERT FAILURE)	10	5	4 MIN		1
	MAL-NCP005SXB (NCP VIB 1B SHAFT HORZ FAILURE)	30	5	2 MIN		1
	MAL-NCP005SYB (NCP VIB 1B SHAFT VERT FAILURE)	30	5	2 MIN		1
	Ensure EVENT 1 = x10d185m>400 (NCP B AMPS > 400)					

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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INITIAL CONDITIONS:

EP/1/A/5000/ES-0.2, Natural Circulation Cooldown has been implemented following a Reactor Trip caused by a lightning strike in the switchyard. Normal power has been restored.

INITIATING CUES:

Start NC Pump 1B by completing OP/1/A/6150/002A, NC Pump Operation Enclosure 4.1. The Initial Conditions of Enclosure 4.1 have been satisfied.

EXAMINER NOTE: After reading cue, provide the applicant with a copy of OP/1/A/6150/002A (Reactor Coolant Pump Operation), Enclosure 4.1 (Startup and Operation of the NC Pumps).

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

NOTE: In order to start an NC Pump, the underfrequency condition must be cleared by having at least three of four 6900V breakers (1TA, B, C, D-3) racked in and energized. STEP 1: 3.1 **IF** Unit 1 is in Mode 5, refer to Tech Spec Table 3.4.12-1 (Reactor Coolant Pump Operating Restrictions For Low Temperature Overpressure Protection) for temperature limitations on NC Pump starts. STANDARD: Applicant determines that this step does not apply. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 2 3.2 **IF** the pump to be started will be the fourth NC Pump in service on Unit 1, verify NC temperature is > 130°F. {PIP 96-1290, PIP 02-484} STANDARD: Applicant determines that this step does not apply. COMMENTS:	___ **SAT** ___**UNSAT**

STEP/STANDARD	SAT/UNSAT
NOTE: If #1 Seal ΔP gauge overranged, ΔP can be determined using 1NV125B (Excess Letdn Hx Otlt Ctrl) "VCT" or "NCDT" switch position as follows: • "VCT" position: NC Press minus Excess Letdn Hx Otlt Press = #1 Seal ΔP • "NCDT" position: NC Press minus VCT Press = #1 Seal ΔP STEP 3 3.3 Verify that No. 1 seal ΔP is greater than 200 psig for the pump to be started per the following gauges: (Control Board 1MC5) • 1B NCP: 1NVP5220 STANDARD: Applicant verifies seal ∆P > than 200 psid using stated gauge OR for VCT position: NC Press minus Excess Letdn Hx Otlt Press = #1 Seal ∆P COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 4 3.4 Verify that the standpipe level for the pump to be started is normal by its associated annunciator DARK: • "NCP B #2 SEAL S-PIPE HI/LO LVL" 1AD-7 A/2 STANDARD: Applicant verifies annunciator is DARK. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 5 3.5 Verify that VCT pressure is ≥ 15 psig. STANDARD: Applicant determines VCT pressure is ≥ 15 psig on the OAC or per 1NVP5500 (VCT VENT PRESS) ON 1MC-5. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 6 3.6 Verify 7-10 gpm seal injection flow on the pump to be started by the following gauges: (Control Board 1MC5) • 1B NCP: 1NVP5320 STANDARD: Applicant verifies seal injection is within range on 1NCP5230. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
NOTE: 1. If #1 Seal Leakoff Flow rate is < 1.0 gpm, the # 1 Seal Low Flow indication shall be used. 2. If #1 Seal ΔP gauge overranged, ΔP can be determined using 1NV125B (Excess Letdn Hx Otlt Ctrl) "VCT" or "NCDT" switch position as follows: • "VCT" position: NC Press minus Excess Letdn Hx Otlt Press = #1 Seal ΔP • "NCDT" position: NC Press minus VCT Press = #1 Seal ΔP STEP 7 3.7 Verify adequate #1 Seal Leakoff Flow on the pump to be started as follows: 3.7.1 Determine required #1 Seal Leakoff Flow from Revised Data Book Figure 26 (NC Pump No. 1 Seal Normal Operating Range). STANDARD: Applicant determines that the minimum required #1 Seal Leakoff Flow is approximately 1 gpm. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 8 3.7.2 Add 0.26 gpm to the minimum required #1 Seal Leakoff Flow of Figure 26 to correct for an expected drop in leakoff flow on pump start (0.20 gpm) and instrument inaccuracy (0.06 gpm). STANDARD: Applicant determines that the minimum required is 1 + 0.26 = 1.26 COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT

STEP 9 3.7.3 Obtain the current #1 Seal Leakoff Flow per one of the following:
 	
• DCS graphic 6002 (NC PUMPS)
OR
• Unit 1 Reactor Coolant Pumps graphic (NCPMPALL)
OR
• Appropriate OAC point
 	
  • C1A1376 (NC Pmp B No. 1 Seal Leakoff Lo Flow)
  • C1A0442 (NC Pmp B No. 1 Seal Leakoff Flow)
 	
STANDARD:
 	
Applicant obtains the current #1 Seal Leak Flow.
 	
COMMENTS:
	___ **SAT**
	
	___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
NOTE: 1. Operating Experience has shown that when NC Pump seal work has been performed during outages higher than desired seal leakoff flow can occur until NC Pump seal is seated. 2. Step 3.7.4.2 only applicable when OP/1/A/6150/001 (Filling and Venting the Reactor Coolant System) in progress. STEP 10 3.7.4 Perform one of the following based on indicated #1 Seal Leakoff Flow: 3.7.4.1 Verify the indicated #1 Seal Leakoff Flow (Step 3.7.3) is within the range of Data Book Figure 26 as adjusted per Step 3.7.2. STANDARD: Applicant determines that the #1 Seal Leakoff Flow is within limits. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 11 3.8 Verify upper and lower oil pot levels normal, for the pump to be started, via one of the following: • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • Visual inspection (local) OR • Associated annunciators DARK: • "NCP B UPPER/LOWER OIL RESERVOIR LO LEVEL" 1AD-6 F/2 STANDARD: Applicant verifies oil pot levels are normal per one of the listed indications. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
NOTE: KC flow is **NOT** required to the Thermal Barrier Hx whenever NC System temperature is less than 200°F. STEP 12 3.9 Verify KC flow to the Thermal Barrier Heater Exchanger normal, for the pump to be started, via one of the following: • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • Associated annunciators DARK: • "NCP B THERMAL BARRIER KC OUTLET HI/LO FLOW" 1AD-6 E/2 STANDARD: Applicant determines that KC flow to the Thermal Barrier Exchanger is normal per one of the indications. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 13 3.10 Verify KC flow to the Upper Motor Bearing Oil Cooler normal, for the pump to be started, via one of the following: • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • Associated annunciators DARK: • "NCP B MTR UPPER BRG KC OUTLET HI/LO FLOW" 1AD-6 C/2 STANDARD: Applicant determines that KC flow to the Upper Motor Bearing Oil Cooler is normal per one of the indications. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 14 3.11 Verify KC flow to the Lower Motor Bearing Oil Cooler normal, for the pump to be started, via one of the following: • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • Associated annunciators DARK: • "NCP B MTR LOWER BRG KC OUTLET LO FLOW" 1AD-6 D/2 STANDARD: Applicant determines that the KC flow to the Lower Motor Bearing Oil Cooler is normal per one of the indications. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 15 3.12 Verify annunciator 1AD-11, K-6, "230 KV SWITCHYARD VOLTAGE LO" is dark. STANDARD: Applicant determines that 1AD-11, K/6 is dark. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 16 3.13 **IF** the 6.9kv switchgear supplying the NC Pump to be started is also supplying a 4160v Essential Bus, verify the following: STANDARD: Applicant determines that the step does not apply. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 17 3.14 Two minutes prior to starting NC pump, start one oil lift pump for NCP to be started by pressing the "ON" pushbutton for: • "NC PUMP OIL LIFT PUMP B1" • "NC PUMP OIL LIFT PUMP B2" STANDARD: Applicant depresses the red ON pushbutton for NC PMP OIL LIFT PMP B1 or B2 approximately two minutes prior to starting the 1B NC Pump. **This step is critical to lift and lubricate the pump so that it can be started.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
NOTE: 1. If NC pump is **NOT** started, the oil lift pump shall be secured to minimize stress on oil nozzles. 2. The Degraded Bus Voltage Relays (27N) may actuate on the essential bus being supplied by the 6.9KV Switchgear associated with the NC Pump to be started in the following step. The alarm condition is expected to clear within 36 seconds.{PIP 95-0287} STEP 18 3.15 Start desired NC pump by pressing the "ON" pushbutton for: (R.M.) • "NC PUMP 1B" STANDARD: Applicant depresses the red ON pushbutton for NC PMP 1B. Once Hi Hi vibration is verified, the pump should be tripped. **This step is critical to start the 1B NC Pump and then trip the pump upon verification of Hi Hi Vibration to protect the pump from further damage.** **NOTE TO EXAMINER: Approximately 5 seconds after the NCP is started, the Hi Hi Vibration alarm will come in. The shaft vibration will reach 20 mils prior to reaching 5 on the mount. Per the annunciator response, the pump should be tripped at >20 mils in Modes 1 and 2, but not until >30 mils in Mode 3 (current condition). At 5 mils on the mount, the pump is tripped regardless of mode. 5 mils on the mount will occur before 30 mils on the shaft.** **EXAMINER CUE: AFTER the pump is tripped: "The CRS has pulled AP/1/A/5500/004 (Loss of Reactor Coolant Pump) and is ready to proceed."** COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
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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:

EP/1/A/5000/ES-0.2, Natural Circulation Cooldown has been implemented following a Reactor Trip caused by a lightning strike in the switchyard. Normal power has been restored.

INITIATING CUES:

Start NC Pump 1B by completing OP/1/A/6150/002A, NC Pump Operation Enclosure 4.1. The Initial Conditions of Enclosure 4.1 have been satisfied.

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System JPM E

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EVALUATION SHEET

Task: Synchronize the Generator to the Grid

Alternate Path: Yes

Facility JPM #: NEW

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

K/A 045 A4.02 Ability to manually operate and/or monitor in the control room: T/G controls, including breakers

Rating(s): 2.7 / 2.6 **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/B/6300/001 (Turbine Generator) rev. 099

Task Standard: Synchronizes the generator to the grid.

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 #172**
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
	OVR-EP006B (GEN BKR 1B TRIP ENABLE PB)	ON				2
	OVR-EP006C (GEN BKR 1B TRIP PB)	ON				2
	OVR-EP007B (GEN BKR 1A TRIP ENABLE PB)	ON				4
	OVR-EP007C (GEN BKR 1A TRIP PB)	ON				4
	Ensure EVENT 2 = x01i120a & !x01i148e					
	Ensure EVENT 4 = x01i120b & !x01i147e					

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

- **Unit 1 is in MODE 1 at 14% power.**
- **Turbine Generator startup is in progress per OP/1/B/6300/001 (Turbine Generator) Enclosure 4.1 (Turbine Generator Startup).**

INITIATING CUES:

The CRS has instructed you synchronize the generator to the grid in auto and pick up load per Step 3.62. Peer Checks have been waived.

EXAMINER NOTE: After reading cue, provide the applicant with a copy of OP/1/B/6300/001 (Turbine Generator) Enclosure 4.1 (Turbine Generator Startup).

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 3.62 Synchronize the Generator to the grid as follows: 3.62.1 Prior to placing the turbine generator on line, ensure Rx power is between 13% and 15% power. STANDARD: Applicant determines Rx power is approximately 14%. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 2 3.62.2 Announce the following over the plant page: "Placing Unit 1 Main Turbine on line, please clear the Transformer Yard". STANDARD: Applicant makes an announcement using the beige phone on 1MC-1 COMMENTS:	___ **SAT** ___**UNSAT**

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STEP/STANDARD	SAT/UNSAT
NOTE: If "MAN/AUTO REG" (1MC1) indicates "MAN", Manual sync of Generator is required. STEP 3 3.62.3 **IF** Auto sync of the Generator is desired, perform the following: 3.62.3.1 Verify "MAN/AUTO REG" in "AUTO" (1MC1). STANDARD: Applicant determines auto sync of the generator is desired per the initiating cue and determines that the AUTO light for MAN/AUTO REG is LIT COMMENTS:	___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
NOTE: 1. When "GEN SYNC SELECT" switch is turned to "AUTO 1A" or "AUTO 1B", the AVR Auto Sync Relay automatically adjusts Terminal voltage and Turbine speed and closes the selected breaker. 2. The following will occur when the Generator Breaker closes: • 6-7 MWe is picked up. • A Target of 60 MWe is automatically input. • A Load Rate of 12 MW/MIN is automatically input. • The MW feedback loop is placed in service. • The turbine is placed in "HOLD". STEP 4 3.62.3.2 Turn "GEN SYNC SELECT" switch (1MC1) to "AUTO 1A" or "AUTO 1B" position. STANDARD: Applicant places the GEN SYNC SELECT switch to either the AUTO 1A or AUTO 1B position. **EXAMINER NOTE: The first breaker selected will fail to close.** COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 5 3.62.3.3 **IF** the selected Generator Breaker did **NOT** close, perform the following: A. Depress "Auto Sync Enable" on Turbine Control panel. STANDARD: Applicant depresses the “Auto Sync Enable” button on the Turbine Control Panel. COMMENTS:	___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 6 B. **IF** selected Generator Breaker fails to close within 5 minutes, perform Steps 3.62.3.2 - 3.62.3.3 for opposite breaker. STANDARD: Applicant determines that the generator breaker failed to close and returns to step 3.62.3.2 for the opposite breaker. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 7 3.62.3.2 Turn "GEN SYNC SELECT" switch (1MC1) to "AUTO 1A" or "AUTO 1B" position. STANDARD: Applicant places the GEN SYNC SELECT switch to the opposite position than was selected the first time. **This step is critical to close a generator breaker and synchronize the generator grid.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
. STEP 8 3.62.3.3 **IF** the selected Generator Breaker did **NOT** close, perform the following: STANDARD: Applicant determines the step does not apply this time. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 9 3.62.3.4 Return "GEN SYNC SELECT" switch to the "MAN" position. STANDARD: Applicant places the GEN SYNC SELECT switch to the MAN position. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 10 3.62.4 **IF** Manual sync of Generator is desired, perform the following: STANDARD: Applicant determines that this step does not apply. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 11 3.62.5 After Generator Breaker 1A (or 1B) has closed, verify the following: 3.62.5.1 A Target of 60 MWe. 3.62.5.2 A Load Rate of 12 MW/Min. STANDARD: Applicant verifies a target of 60 MWe and a Load Rate of 12MW/Min is present on the Turbine Control Panel or the Turbine Graphic. COMMENTS:	___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 12 3.62.6 Select "GO" to pick up load. STANDARD: Applicant depresses the “GO” button on the Turbine Control Panel. **This step is critical to pick up load.** COMMENTS:	**CRITICAL STEP** **___ SAT** **___ UNSAT**
STEP 13 3.62.7 **WHILE** continuing with the power increase, but before 50% power, place other Generator Breaker in service as follows: STANDARD: Applicant reads the step. **EXAMINER CUE: “Another operator will place the other breaker in service.”** COMMENTS: **END OF TASK**	**___ 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 is in MODE 1 at 14% power.**
- **Turbine Generator startup is in progress per OP/1/B/6300/001 (Turbine Generator) Enclosure 4.1 (Turbine Generator Startup).**

INITIATING CUES:

The CRS has instructed you synchronize the generator to the grid in auto and pick up load per Step 3.62. Peer Checks have been waived.

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System JPM F

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EVALUATION SHEET

Task: Restore Normal Power to 1ETB and Shutdown D/G 1B from the Control Room

Alternate Path: Yes

Facility JPM #: DG3-004 (Modified)

Safety Function: 6 **Title:** Emergency Diesel Generator (ED/G) System

K/A 064 A4.01 Ability to manually operate and/or monitor in the control room: local and remote operation of the ED/G

Rating(s): 4.0 / 4.3 **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/6350/002 (Diesel Generator Operation) rev. 157 , Enclosure 4.18

Task Standard: 1ETB power being supplied from 1ATD and D/G is "OFF"

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

==========

COMMENTS

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JPM F
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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC #173**
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
	IND-DG012 (D/G 1B P/F METER)	.500		2 SEC		2
	IND-DG013 (D/G 1B KW METER)	0		2 SEC		2
	Ensure EVENT 2 = x11i343c (1ATD CLOSE pushbutton)					

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JPM F
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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

Unit 1 is recovering from a Unit Blackout per AP/1/A/5500/007 Case I (Loss of Normal Power to an Essential Train). 1ATD is energized and available to supply 1ETB. D/G 1B Mode Select Switch is in the "CTRL-RM" position. The D/G Load Sequencer has been reset.

INITIATING CUES:

The SRO instructs you to parallel D/G 1B to 1ETB's normal power source (1ATD) and shutdown D/G 1B, per OP/1/A/6350/002 (Diesel Generator Operation), Enclosure 4.18, by completing step 3.2. IV will be waived during the performance of this JPM.

EXAMINER NOTE: After reading cue, provide the applicant with a copy of OP/1/A/6350/002 Enclosure 4.18

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 3.2 **IF** shutting down the diesel from the Control Room, perform the following: 3.2.1 **IF** both the normal (ETB Norm Fdr Frm ATD) **AND** alternate (ETB Alt Fdr Frm SATB) incoming feeder breakers are open, perform the following: **CAUTION:** It is essential for the Operator to read and understand the following steps before attempting to re-synchronize the D/G and bus to the normal or alternate power source. Quick response to any changes in load and power factor when the breaker closes is required to reduce the likelihood of a reverse power D/G Breaker trip. 3.2.1.1 Adjust voltage using "D/G 1B Volt Adjust" to allow "D/G 1B Volts" to be one half to two divisions (50 to 200 volts) higher than "Line Volts". STANDARD: Applicant determines that both feeder breakers are open and adjusts D/G voltage using the “D/G 1B Volt Adjust” until “D/G 1B Volts” are one half to two divisions (50 to 200 volts) higher than “Line Volts” on 1MC-8 COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 2 3.2.1.2 Place the "D/G 1B Sync" Switch in the "ON" position. STANDARD: Applicant places the “D/G 1B Sync Switch” in the “ON” position on 1MC-11 COMMENTS:	___ **SAT** ___**UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 3 3.2.1.3 Adjust D/G speed using "D/G 1B Gov Ctrl" such that the Synchroscope is moving slowly in the "FAST" direction, (approximately 1 revolution per 30 seconds). STANDARD: Applicant adjusts D/G speed using the “D/G 1B Gov Ctrl” until the Synchroscope is moving slowly in the fast direction. COMMENTS:	___ **SAT** ___ **UNSAT**
CAUTION: The following three steps shall be performed prior to signing off either step to reduce the likelihood of a reverse power D/G Breaker trip. STEP 4 3.2.1.4 As the indicator reaches 1.5 min. before the vertical (synchronized) position, close one of the following breakers: • ETB Norm Fdr Frm ATD OR • ETB Alt Fdr Frm SATB STANDARD: Applicant closes ETB Norm Fdr Frm ATD per the initiating cue. **This step is critical to align 1ETB to its normal power source.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 5 3.2.1.5 Stabilize the D/G with a positive load and a lagging power factor. STANDARD: Applicant will attempt to stabilize the D/G with a positive load and a lagging power factor utilizing the "D/G 1B GOV CTRL" and the "D/G 1B VOLT ADJUST" on 1MC-11. **EXAMINER NOTE: Applicant will not be successful performing this step.** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 6 3.2.1.6 **IF** the power factor meter indicates severely leading, (pegs high) **AND** power output decreases to 0 KW (pegs low) then IMMEDIATELY trip D/G 1B Bkr To ETB. STANDARD: Applicant determines that the step applies and trips the D/G 1B Bkr To ETB. **This step is critical to minimize damage to the diesel generator from reverse power.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 7 3.2.1.7 Place the "D/G 1B Sync" Switch in the "OFF" position. Record time_____ STANDARD: Applicant places the “D/G 1B Sync” switch in the “OFF” position. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 8 3.2.2 Verify one of the following breakers is closed: • ETB Norm Fdr Frm ATD OR • ETB Alt Fdr Frm SATB STANDARD: Applicant verifies the red CLSD light is lit for ETB Norm Fdr Frm ATD COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 9 3.2.3 **IF** D/G 1B Bkr To ETB is open, go to Step 3.2.7. STANDARD: Applicant determines that the green OPEN light is lit on D/G 1B BKR TO ETB and goes to Step 3.2.7 COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 10 3.2.7 Allow diesel to idle unloaded for a minimum of 5 minutes or until the following conditions are met: • Jacket water outlet temperature is < 170°F. • Lube oil outlet temperature is < 170°F. • Turbocharger exhaust temperatures have stabilized. STANDARD: Applicant reads the step. **EXAMINER CUE: "Jacket water temperature is 160°F, Lube Oil outlet temperature is 167°F and the Turbocharger exhaust temperatures have stabilized."** COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 11 3.2.8 Ensure one of the following conditions is met: • The D/G Sequencer is "RESET". OR • Power has been removed from the D/G Sequencer. STANDARD: Applicant determines that the D/G Sequencer has been reset per the initial conditions or the yellow D/G LOAD SEQ RESET light LIT on 1MC-11 COMMENTS:	___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 12 3.2.9 Depress the D/G 1B "OFF" pushbutton to stop the engine. Record time_____ STANDARD: Applicant depresses the green OFF pushbutton on D/G 1B on 1MC-11 **This step is critical to shut down the diesel.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 13 3.2.10 **WHEN** the engine stops, dispatch Operators as necessary to verify the following: • The "L.O. Pump & Heater" light indicates "ON". • The "J.W. Pump & Heater" light indicates "ON". • 1RN-292B (1B D/G Hx Inlet Isol) (DB-566, AA-38) closes. STANDARD: Applicant reads the step. **EXAMINER CUE: "An operator has been dispatched."** COMMENTS: **END OF TASK**	___ **SAT** ___ **UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
2014 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 recovering from a Unit Blackout per AP/1/A/5500/007 Case I (Loss of Normal Power to an Essential Train). 1ATD is energized and available to supply 1ETB. D/G 1B Mode Select Switch is in the "CTRL-RM" position. The D/G Load Sequencer has been reset.

INITIATING CUES:

The SRO instructs you to parallel D/G 1B to 1ETB's normal power source (1ATD) and shutdown D/G 1B, per OP/1/A/6350/002 (Diesel Generator Operation), Enclosure 4.18, by completing step 3.2. IV will be waived during the performance of this JPM.

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JPM G
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System JPM G

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EVALUATION SHEET

Task: Shift Lower Containment Vent 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 _____ Control Room **X** **P**erform _____ **S**imulate **X**

References: OP/2/A/6450/001 (Containment Ventilation (VV) Systems rev.033

Task Standard: 2D LCVU running and 2C LCVU off.

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**
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

Catawba Nuclear Station
JPM G
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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

Unit 2 is in MODE 1.

INITIATING CUES:

- **The Control Room Supervisor has instructed you to shift Lower Containment Vent Units by stopping the 2C LCVU and starting the 2D LCVU.**
- **Steps 3.1 and 3.3 were marked N/A during the pre-job brief.**
- **Peer check has been waived.**

EXAMINER NOTE: After reading cue, provide the applicant with a copy of OP/2/A/6450/001 Containment Ventilation (VV) Systems, Enclosure 4.13.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 3.2 **IF** three LCVUs are operating **AND** it is desired, shift the operating units as follows: 3.2.1 **IF** the LCVUs are operating in "LOW" speed, perform the following: 3.2.1.1 Stop the LCVU to be removed from service by placing its control switch in the "OFF" position: • "VV LCVU 2C" STANDARD: Applicant describes placing the switch for VV LCVU 2C to the OFF position. **This step is critical to shut down the desired Lower Containment Vent Unit** **EXAMINER CUE: IF asked, "Three LCVUs are operating."** **EXAMINER CUE: IF asked, "The LCVUs are operating in 'LOW' speed."** **EXAMINER CUE: "The switch for VV LCVU 2C is in the OFF position."** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
NOTE: The procedure may continue up to and including Step 3.2.1.8 before completing the following step. STEP 2 3.2.1.2 Verify the green indicating light illuminates for the LCVU stopped. STANDARD: Applicant describes verifying the green indicating light is LIT for VV LCVU 2C. **EXAMINER CUE: "The green light is LIT."** COMMENTS:	___ **SAT** ___**UNSAT**

STEP 3 3.2.1.3 Verify the red "MAX" indicating light extinguishes for the LCVU stopped. STANDARD: Applicant describes verifying the red "MAX" indicating light for VV LCVU 2C MAX is DARK. **EXAMINER CUE: "The red "MAX" light is DARK.** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 4 3.2.1.4 Verify the green "CLOSED" indicating light illuminates for the LCVU damper associated with the LCVU stopped. STANDARD: Applicant describes verifying the green “CLOSED” indicating light for 2LCVU-D-3 LWR CONT VENT DAMPER is LIT. **EXAMINER CUE: “The green light is LIT.”** COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 5 3.2.1.5 Start the idle LCVU by placing its control switch in the "LOW" position: • "VV LCVU 2D" STANDARD: Applicant describes placing the switch for VV LCVU 2D in the LOW position. **This step is critical to start the desired LCVU.** **EXAMINER CUE: “The switch for LCVU 2D is in the LOW position.”** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 6 3.2.1.6 Verify the red indicating light illuminates for the LCVU placed in service. STANDARD: Applicant describes verifying the red (middle) indicating light for VV LCVU 2D is LIT. **EXAMINER CUE: "The red light is LIT."** COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 7 3.2.1.7 Verify the red "OPEN" indicating light illuminates for the LCVU damper associated with the LCVU started. STANDARD: Applicant describes verifying the red "OPEN" indicating light for 2LCVU-D-4 LWR CONT VENT DAMPER. **EXAMINER CUE: "The red light is LIT."** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 8 3.2.1.8 Verify the red "MAX" indicating light illuminates for the LCVU placed in service. STANDARD: Applicant describes verifying the red light for VV LCVU 2D MAX is LIT **EXAMINER CUE: "The red light is LIT."** COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 9 3.2.2 **IF** the LCVUs are operating in "HIGH" speed, perform the following: STANDARD: Applicant determines that this step does not apply. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 10 3.4 Indicate below the operating Pipe Tunnel Booster Fan: • "PIPE TUNNEL BSTR FAN 2A" • "PIPE TUNNEL BSTR FAN 2B" STANDARD: Applicant marks the box for the operating Pipe Tunnel Booster Fan. **EXAMINER CUE: IF ASKED, "Pipe Tunnel Booster Fan 2A is ON."** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 11 3.5 Indicate below the operating LCVUs: • "VV LCVU 2A" • "VV LCVU 2B" • "VV LCVU 2C" • "VV LCVU 2D" STANDARD: Applicant marks the blocks for the 2A, 2B and 2D LCVUs. COMMENTS: **END OF TASK**	___ **SAT** ___ **UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
2014 NRC Initial License Exam
JPM G

READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

Unit 2 is in MODE 1.

INITIATING CUES:

- **The Control Room Supervisor has instructed you to shift Lower Containment Vent Units by stopping the 2C LCVU and starting the 2D LCVU.**
- **Steps 3.1 and 3.3 were marked N/A during the pre-job brief.**
- **Peer check has been waived.**

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System JPM H

Catawba Nuclear Station
JPM H
May 2014 NRC Initial License Exam

EVALUATION SHEET

Task: Place Standby Component Cooling Train in Service

Alternate Path: No

Facility JPM #: KC-082 (Modified)

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

K/A 008 A4.01 Ability to manually operate and/or monitor in the control room: CCW indications and controls

Rating(s): 3.3 / 3.1 **CFR:** 41.7 / 45.5

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

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

References: OP/1/A/6400/005 (Component Cooling System) rev. 116

Task Standard: "1B1" Component Cooling Pump running and '"B" KC HX outlet valve in "KC TEMP" position. "1A2" KC Pump stopped and "A" KC HX Outlet Valve aligned for miniflow.

Validation Time: 20 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 H
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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC #175**
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

Catawba Nuclear Station
JPM H
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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

- **Unit 1 is operating at 100% with "1A2" KC Pump in operation.**
- **KC Pump "1A2" needs to be removed from service to permit preventive maintenance on the pump and motor.**

INITIATING CUES:

- **The Control Room SRO instructs you to shift trains of KC with 1B1 KC Pump in service and take KC Pump "1A2" out of service beginning at step 3.1.2 in enclosure 4.3 of OP/1/A/6400/005.**
- **Concurrent verification and peer checks have been waived and the "B" train KC pumps have been "checked out" satisfactorily by a NLO.**

EXAMINER NOTE: After reading cue, provide the applicant with a copy of OP/1/A/6400/005 (Component Cooling System), Enclosure 4.3 (Shifting Trains).

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 3.1.2 Ensure 1RN-347B (KC Hx 1B Inlet Isol) is open. STANDARD: Applicant determines that 1RN-347B is open by verifying the red OPEN light is LIT or via the OAC. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 2 3.1.3 Ensure "KC HX 1B OTLT MODE" is in "KC TEMP". STANDARD: Applicant places the switch for KC HX 1B OTLT MODE in the “KC TEMP” position on 1MC-11. **This step is critical to ensure that the outlet of the KC Heat exchanger is controlled at the proper temperature.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___**UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 3 3.1.4 **IF** letdown is in service per OP/1/A/6200/001 (Chemical and Volume Control System) perform the following: (R.M.) 3.1.4.1 Verify the Cation Bed Demineralizer is **NOT** in service per OP/1/A/6200/001 (Chemical and Volume Control System). STANDARD: Applicant determines that letdown is in service and that the Cation Bed Demineralizers are not in service. **EXAMINER CUE: IF ASKED, "The Cation Bed Demineralizers are not in service."** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 4 3.1.4.2 Record position of 1NV-153A (Letdn Hx Otlt 3-Way Vlv). Recorded valve position_____ STANDARD: Applicant determines that the position of 1NV-153A is in the "DEMIN" position. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 5 3.1.4.3 **IF** letdown flow is through the demineralizers, notify Primary Chemistry that the demineralizers will be bypassed while shifting KC Trains. Person notified _____ STANDARD: Applicant determines that letdown flow is through the demineralizers and notifies Primary Chemistry that the demineralizers will be bypassed while shifting KC Trains. **EXAMINER CUE: "This is Stephanie Jackson from Primary Chemistry, I understand the demineralizers will be bypassed while shifting KC Trains."** COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 6 3.1.4.4 **IF** letdown flow is through the demineralizers, notify Radiation Protection that the demineralizers will be bypassed while shifting KC Trains. Person notified _____ STANDARD: Applicant notifies Radiation Protection that the demineralizers will be bypassed while shifting KC Trains. **EXAMINER CUE: "This is Christina Frey from Radiation Protection, I understand that the demineralizers will be bypassed while shifting KC Trains.** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 7 3.1.4.5 Place 1NV-153A (Letdn Hx Otlt 3-Way Vlv) in the "VCT" position. STANDARD: Applicant places the switch for 1NV-153A to the “VCT” position. **This step is critical to bypass the demineralizer to prevent a change in reactivity due to the changing boron affinity of the demineralizers caused by letdown temperature changes due to component cooling temperature changes when the trains are shifted.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
CAUTION: 5700 gpm discharge header flow per each operating KC pump shall **NOT** be exceeded. STEP 8 3.1.5 Start either KC Train 1B pump: • "KC PUMP B1" STANDARD: Applicant depresses the red ON pushbutton for KC PUMP 1B on 1MC-11 **This step is critical to start the desired pump.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 9 3.1.6 Adjust the following flow controllers on 1MC11 to zero gpm flow: • 1KC-149 (KF Hx 1A Cool Wtr Otlt) STANDARD: Applicant adjusts the controller for 1KC-149 to zero gpm. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 10 3.1.7 Stop all KC Train 1A pumps: • "KC PUMP A2" STANDARD: Applicant depresses the green OFF pushbutton for KC PUMP A2 on 1MC-11 **This step is critical to secured the desired pump.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 11 3.1.8 Place "KC HX 1A OTLT MODE" in "MINIFLOW" position. STANDARD: Applicant places the switch for KC HX 1A OTLT MODE in the “MINIFLOW” position on 1MC-11 COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 12 3.1.9 **IF AT ANY TIME** KC Train flow approaches 5700 gpm while performing the next step, ensure 1KC-C40B (Train B Miniflow Isol) is closed. STANDARD: Applicant ensures that 1KC-40B is closed on 1MC-11. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 13 3.1.10 Perform the following for the KF cooling loops that are in service: • Adjust 1KC-149 (KF Hx 1A Cool Wtr Otlt) flow controller on 1MC11 to 3000 gpm or as necessary to maintain Spent Fuel Pool temperature < 125°F. STANDARD: Applicant adjusts 1KC-149 flow controller to less than or ≤ 3000 gpm. **EXAMINER NOTE: Since Spent Fuel Pool temperature is only ~ 115°F, the applicant may decide to adjust 1KC-149 at this time.** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
NOTE: One pump running is preferred as long as flow is < 5700 gpm. STEP 14 3.1.11 **IF** KC flow requirement is > 5700 gpm, perform the following: STANDARD: Applicant determines that this step does not apply. COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 15 3.1.12 **IF** letdown is in service per OP/1/A/6200/001 (Chemical and Volume Control System), **WHEN** KC flow and temperature have stabilized perform the following: (R.M.) 3.1.12.1 **IF** 1NV-153A (Letdn Hx Otlt 3-Way Vlv) position was recorded as "DEMIN" in Step 3.1.4.2 **AND** no other reason exists for it to remain in the "VCT" position, return it to "AUTO" as follows: A. Place 1NV-153A in the "DEMIN" position. (R.M.) B. Verify 1NV-153A returns to "AUTO". STANDARD: Applicant places the control switch for 1NV-153A to the “DEMIN” position and returns it to AUTO on 1MC-10. COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 16 3.1.12.2 **IF** letdown flow is through the demineralizers, notify Primary Chemistry that the demineralizers have been restored to service. Person notified _____ STANDARD: Applicant notifies Primary Chemistry that the demineralizers have been restored to service. **EXAMINER CUE: "This is Stephanie Jackson from Primary Chemistry, I understand the demineralizers have been restored to service."** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 17 3.1.12.3 **IF** letdown flow is through the demineralizers, notify Radiation Protection that the demineralizers have been restored to service. Person notified _____ STANDARD: Applicant notifies Radiation Protection that the demineralizers have been restored to service. **EXAMINER CUE: "This is Christina Frey from Radiation Protection, I understand the demineralizers have been restored to service."** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 18 3.1.13 **IF** RN miniflow was established per Step 3.1.1.2, secure unneeded flow paths. STANDARD: Applicant determines that this step does not apply. COMMENTS: **END OF TASK**	___ **SAT** ___ **UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
2014 NRC Initial License Exam
JPM H

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 operating at 100% with "1A2" KC Pump in operation.**
- **KC Pump "1A2" needs to be removed from service to permit preventive maintenance on the pump and motor.**

INITIATING CUES:

- **The Control Room SRO instructs you to shift trains of KC with 1B1 KC Pump in service and take KC Pump "1A2" out of service beginning at step 3.1.2 in enclosure 4.3 of OP/1/A/6400/005.**
- **Concurrent verification and peer checks have been waived and the "B" train KC pumps have been "checked out" satisfactorily by a NLO.**

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System JPM I
In-Plant

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EVALUATION SHEET

Task: Break Condenser Vacuum Locally

Alternate Path: None

Facility JPM #: CA-084

Safety Function: 4S **Title:** Main Turbine Generator (MT/G) System

K/A 045 A1.06 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MT/G system controls including: Expected response of secondary plant parameters following T/G trip

Rating(s): 3.3 / 3.7 **CFR:** 41.5 / 45.5

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

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

References: AP/2/A/5500/006 (Loss of S/G Feedwater) Enclosure 3

Task Standard: Enclosure 3 has been completed with the first vacuum breaker opened within 10 minutes.

Validation Time: 8 minutes **Time Critical:** Yes **X** No _____

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Applicant: Time Start: _____

NAME _____ Docket #_____ Time Finish: _____

Performance Rating: SAT ____ UNSAT ____ Performance Time ___

Examiner: _____ _____/_____

NAME SIGNATURE DATE

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COMMENTS

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SIMULATOR OPERATOR INSTRUCTIONS:

1. **ENSURE NRC Examination Security has been established.**
2. **Reset to IC #**
3. **Enter the password.**
4. **Select "Yes" on the INITIAL CONDITION RESET pop-up window.**
5. **Ensure simulator setup per table below.**
6. **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

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READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

- **Unit 2 is in Mode 3 following a reactor trip.**

INITIATING CUES:

- **The Control Room Supervisor instructs you to perform AP/2/A/5500/006 (Loss of S/G Feedwater) Enclosure 3 (Local Actions to Break Condenser Vacuum).**

This JPM is TIME CRITICAL; time begins when you acknowledge the task.

EXAMINER NOTE: Provide applicant with a copy of the procedure.

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STEP/STANDARD	SAT/UNSAT

START TIME _____

Examiner NOTE:

Critical Time Start: Record Time that applicant acknowledges the task _____.

CRITICAL STEP

___ **SAT**

___ **UNSAT**

CAUTION **High air flow rates will exist when vacuum breakers are first opened. Stay clear of pipe end.**

STEP 1: 1. **Break condenser vacuum by opening the following valves:**

- 2CM-368 (2A Main Cond Shell Vacuum Bkr) (TB2-600,2F-2G, 26) (Ladder needed)
- 2CM-369 (2B Main Cond Shell Vacuum Bkr) (TB2-600, 2F, 24-25) (Ladder needed)
- 2CM-370 (2C Main Cond Shell Vacuum Bkr) (TB2-609, 2F-22) (Ladder needed).

STANDARD:

Applicant will describe opening the valves: 2CM-368, 2CM-369, 2CM-370

This step is critical in order to open correct valves for breaking vacuum.

Examiner Note: The critical end time is when the applicant describes opening the first valve. Due to the height of the valves, no fall protection will be required.

Examiner Cue: **When** applicant describes engaging lever and rotating handwheel counter clockwise to open the following valve then: "**A large volume of airflow is heard."**

Critical end time_____

COMMENTS:

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STEP/STANDARD	SAT/UNSAT
STEP 2 2. **Secure steam to CSAEs as follows:** a. Close the following valves: • 2SA-22 (Main Steam To CSAE) (TB2-614, 2M-32) • 2SA-27 (Aux Steam To CSAE) (TB-614, 2L-2M, 27). STANDARD: Applicant will describe closing 2SA-22 and 2SA-27 **This step is critical, because if it is not performed, the CSAEs will continue to pull vacuum.** **Examiner Cue:** As applicant properly describes closing the valves give cue as appropriate, "**Valve turns until resistance is felt.**" COMMENTS:	**CRITICAL STEP** ___ **SAT** ___**UNSAT**
STEP 3 b. **WHEN** time and manpower permit, **THEN** complete the shutdown of the CSAEs. **REFER TO** OP/2/B/6300/006 (Main Vacuum). STANDARD: Applicant will read the step **Examiner Cue: The Control Room Supervisor has instructed another operator to complete the shutdown of the CSAEs.** COMMENTS:	___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 4 3. **WHEN requested by Control Room Supervisor, THEN verify condenser vacuum broken as follows:** a. Inspect each vacuum breaker for absence of air flow into condenser. b. Notify Control Room Supervisor of results. STANDARD: Applicant will inspect each vacuum breaker for the absence of air flow into the condenser and will report to the Control Room Supervisor. **Examiner Cue:** After each inspection, **"No air flow into condenser."** COMMENTS:	___ **SAT** ___ **UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
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DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

- **Unit 2 is in Mode 3 following a reactor trip.**

INITIATING CUES:

- **The Control Room Supervisor instructs you to perform AP/2/A/5500/006 (Loss of S/G Feedwater) Enclosure 3 (Local Actions to Break Condenser Vacuum).**

This JPM is TIME CRITICAL; time begins when you acknowledge the task.

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System JPM J
In-Plant

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EVALUATION SHEET

Task: Shifting Main Transformer Auxiliaries

Alternate Path: No

Facility JPM #: EP-016

Safety Function: 6 **Title:** Electrical

K/A 062 A2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Types of loads that, if de-energized, would degrade or hinder plant operation.

Rating(s): 3.4 / 3.9 **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/6350/005 (Alternate AC Power Sources) rev. 076, Enclosure 4.24

Task Standard: The 1A Main Transformer Auxiliaries are transferred to an energized source.

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**
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

Catawba Nuclear Station
JPM J
May 2014 NRC Initial License 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 is at 100% power.**
- **The incoming feeder breaker to 1LXC tripped due to a load center fault.**
- **As a result, one-half of the 1A Main Transformer Auxiliaries have been de-energized.**

INITIATING CUES:

The Unit Supervisor directs you to shift the 1A Main Transformer Auxiliaries to the 1LXD Feeder per Enclosures 4.24 (Shifting Main Transformer 1A Auxiliaries) of OP/1/A/6350/005 (Alternate AC Power Sources).

EXAMINER NOTE: After reading cue, provide the applicant with a copy of OP/1/A/6350/005, Enclosure 4.24.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

NOTE: 1. Shifting of power supplies shall be performed without delay.

2. All breakers and alarm lights are located inside the cabinet at the Main Transformer.

3. During normal operation, loss of a power supply (from LXC or LXD) will be indicated by the associated "NO VOLTAGE BANK A (B)" alarm light at the transformer.

4. Electrical PPE (high voltage gloves, FR clothing, face shield) is required for shifting power supplies.

___ **SAT**

___ **UNSAT**

Examiner Note: **Applicant should state that they would acquire the required PPE.**

STEP 1: 3.1 **IF** shifting Bank A power supplies, perform the following:

3.1.1 Verify voltage indicated on 1LXD per one of the following:

- Transformer 1TXD Supply Voltage meter with 1LXD-4B closed

OR

- Transformer 1TXS Supply Voltage meter with 1LXD-8B closed

STANDARD:

Applicant verifies voltage indicated on transformer 1TXD with 1LXD-4B closed or 1TXS with 1LXD-8B closed.

Examiner Cue: 600 volts is indicated.

COMMENTS:

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STEP/STANDARD	SAT/UNSAT
STEP 2 3.1.2 **IF** this is an unexpected loss of power, verify the following at Transformer 1A: • "NO VOLTAGE BANK A" alarm light illuminated. • "NO VOLTAGE BANK B" alarm light dark. STANDARD: Applicant verifies "NO VOLTAGE BANK A" alarm light is illuminated and the "NO VOLTAGE BANK B" alarm light is dark. **Examiner Cue: NO VOLTAGE BANK A is LIT and NO VOLTAGE BANK B is DARK.** COMMENTS:	___ **SAT** ___**UNSAT**
STEP 3 3.1.3 Open "NORMAL FEEDER 1LXC" breaker. STANDARD: Applicant describes opening the NORMAL FEEDER 1LXC breaker by placing it in the OFF (down) position. **Examiner Cue: NORMAL FEEDER 1LXC is in the OFF position.** **This step is critical to allow the lockout bar to be slid in the following step.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 4 3.1.4 Slide lockout bar to the left. STANDARD: Applicant describes sliding the lockout bar to the left. **Examiner Cue: Lockout bar is to the left.** **This step is critical to allow closing of the EMERG FEEDER 1LXD breaker in the following step.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 5 3.1.5 Close "EMERG FEEDER 1LXD" breaker. STANDARD: Applicant describes closing the EMERG FEEDER 1LXD breaker by placing the breaker to the ON (up) position. **Examiner Cue: EMERG FEEDER 1LXD breaker is in the ON position.** **This step is critical to energize the transformer auxiliaries for the 1A Main Transformer** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 6 3.1.6 Acknowledge any alarms present. STANDARD: Applicant describes acknowledging any alarms. **Examiner Cue: Alarms have been acknowledged.** COMMENTS:	___ **SAT** ___ **UNSAT**
STEP 7 3.1.7 Complete and file Enclosure 4.29 (Unit 1 Main Transformers Cooler Groups Status) to record status. STANDARD: Applicant reads the step. **Examiner Cue: Another operator will complete and file enclosure 4.29** **NOTE:** At this point, Bank A is supplied from 1LXD. Subsequent steps are to return Bank A to 1LXC. COMMENTS: **END OF TASK**	___ **SAT** ___ **UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
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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 100% power.**
- **The incoming feeder breaker to 1LXC tripped due to a load center fault.**
- **As a result, one-half of the 1A Main Transformer Auxiliaries have been de-energized.**

INITIATING CUES:

The Unit Supervisor directs you to shift the 1A Main Transformer Auxiliaries to the 1LXD Feeder per Enclosures 4.24 (Shifting Main Transformer 1A Auxiliaries) of OP/1/A/6350/005 (Alternate AC Power Sources).

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System JPM K
In-Plant

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EVALUATION SHEET

Task: Place the 2A Hydrogen Analyzer in Service

Alternate Path: No

Facility JPM #: VX-024

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

K/A 028 A1.01 Ability to predict and/or monitor changes in parameter (to prevent exceeding design limits) associated with operating the HRPS controls including): Hydrogen concentration

Rating(s): 3.4 / 3.8 **CFR:** 41.5 / 45.5

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

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

References:

- EP/2/A/5000/E-1 (Loss of Reactor or Secondary Coolant), rev. 025
- OP/2/A/6450/010 (Containment Hydrogen Control Systems Enclosure 4.9), rev. 026

Task Standard: Hydrogen Analyzer Train 2A in Service monitoring upper containment.

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

==========

Applicant: Time Start: _____

NAME_____ Docket #_____ Time Finish: _____

Performance Rating: Performance Time _____

SAT ____ UNSAT ____

Examiner: _____ _____/_____

NAME SIGNATURE DATE

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COMMENTS

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JPM K
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SIMULATOR OPERATOR INSTRUCTIONS:

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

✓	Instructor Action	Final	Delay	Ramp	Delete In	Event

Catawba Nuclear Station
JPM K
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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 large break LOCA has occurred on Unit 2.**
- **The procedure currently in use is EP/2/A/5000/E-1 (Loss of Reactor or Secondary Coolant).**
- **Containment Hydrogen Analyzer 2B is tagged for maintenance.**

INITIATING CUES:

- **The Control Room Supervisor directs you to place Containment Hydrogen Analyzer 2A in service to Position "1" for sampling Upper Containment per OP/2/A/6450/010 (Containment Hydrogen Control Systems) Enclosure 4.9, step 3.1. All initial conditions are complete. Peer check has been waived.**

EXAMINER NOTE: After reading cue, provide examinee with a copy of OP/2/6450/010, Enclosure 4.9 with the Initial Conditions signed off.

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STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: 3.1 Place Hydrogen Analyzer Train A **OR** Train B in service. 3.1.1 **IF** aligning Hydrogen Analyzer Train A, proceed as follows: 3.1.1.1 Obtain Hydrogen Analyzer Control Panel Train A (2ELCP0251) key (Key #225) from WCC. STANDARD: Applicant determines from the initiating cue that A train needs to be aligned and obtains the key #225 **EXAMINER NOTE: Key not required to be obtained to complete this JPM task. Once key is identified give cue.** **EXAMINER CUE: "Key 225 has been obtained."** COMMENTS:	___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
NOTE: Steps 3.1.1.2 - 3.1.1.5 will be performed at Hydrogen Analyzer Control Panel Train 2A HACP-2A (2ELCP0251) (AB-579, DD-61). STEP 2 3.1.1.2 Select the desired sample location by positioning the "HYDROGEN ANALYZER SAMPLE VALVES PORTS" switch: • Position "1" (for sampling Upper Containment) • Position "2" (for sampling operating level) • Position "3" (for sampling Steam Generator 1B cavity) • Position "ALL" for sampling ALL 3 locations) STANDARD: Applicant describes placing the HYDROGEN ANALYZER SAMPLE VALVES PORTS" switch in position "1". **EXAMINER CUE: "Switch is in position 1."** **This step is critical to sample Upper Containment.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___**UNSAT**
STEP 3 3.1.1.3 Verify the "POS 1: H2 ANALYZER POS 2: POST ACCIDENT SAMPLE PANEL" switch is in "POS. 1". STANDARD: Applicant describes verifying the switch is in "POS 1" **EXAMINER CUE: "Switch is in position 1."** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
STEP 4 3.1.1.4 Insert key in "HYDROGEN ANALYZER CONT ISOLATION VALVES" key switch and turn to "OPEN" position. STANDARD: Applicant describes inserting the key and turning the key to the “OPEN” position. **This step is critical to open the containment isolation valves in order to be able to sample upper containment.** **EXAMINER CUE: “Key is in the OPEN position.”** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**
STEP 5 3.1.1.5 Verify the following indicating lights are lit: • "H2 SAMPLE CONT. ISOLATION VALVES OPEN" • Sample location(s) selected in Step 3.1.1.2. STANDARD: Applicant describes verifying the red OPEN light LIT for H2 Sample Containment Isolation Valves. **EXAMINER CUE: “Red OPEN light is lit.”** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP/STANDARD	SAT/UNSAT
NOTE: Steps 3.1.1.6 - 3.1.1.7 will be performed inside A Train Hydrogen Analyzer Control Unit (PAMS) 2MIMT5320A (AB-579, DD-61). STEP 6 3.1.1.6 Verify the "STANDBY/OFF" switch is in the "STANDBY" position. STANDARD: Applicant describes verifying the “STANDBY/OFF” switch is in the “STANDBY” position. **EXAMINER CUE:** **“Switch is in the ‘STANDBY’ position.”** COMMENTS:	___ **SAT** ___ **UNSAT**

STEP 7 3.1.1.7 Place the "ON/OFF" switch in the "ON" position. STANDARD: Applicant describes moving the ON/OFF switch up to the “ON” position. **This step is critical to turn the analyzer on.** **EXAMINER CUE:** **“Switch is in the ‘ON’ position and the green ‘ON’ light is lit.”** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ **UNSAT**

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STEP/STANDARD	SAT/UNSAT
STEP 8 3.1.1.8 Monitor H_2 concentration at either of the following locations: • "Hydrogen Analyzer Control Unit "2MIMT5320A" (AB-579, DD-61) • "CONTAINMENT TRN A H2 ANAL" meter (2MIP5320) located on 2MC7. STANDARD: Applicant describes calling the control room to inform them that the hydrogen analyzers are in service and can be read on the local unit or on 2MC-7. **EXAMINER CUE:** **"Hydrogen concentration will be monitored on 2MC-7."** COMMENTS: **END OF TASK**	___ **SAT** ___ **UNSAT**

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)
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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:

- **A large break LOCA has occurred on Unit 2.**
- **The procedure currently in use is EP/2/A/5000/E-1 (Loss of Reactor or Secondary Coolant).**
- **Containment Hydrogen Analyzer 2B is tagged for maintenance.**

INITIATING CUES:

- **The Control Room Supervisor directs you to place Containment Hydrogen Analyzer 2A in service to Position "1" for sampling Upper Containment per OP/2/A/6450/010 (Containment Hydrogen Control Systems) Enclosure 4.9, step 3.1. All initial conditions are complete. Peer check has been waived.**