Facility: McGuire	Date of Examination: 8/2/10
Exam Level (circle one): *RO (only)* / SRO(I) / **SRO (U)**	Operating Test No.: N10-1

Control Room Systems@ (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. 006 Emergency Core Cooling System Transfer the NI Pumps from Cold Leg Recirc to Hot Leg Recirc	S, D, EN	2
b. 005 Residual Heat Removal System **Respond to ND System Malfunction While at Mid Loop**	**S, D, A, L**	**4P**
c. 056 Condensate System **Swap Hotwell/CM Booster Pumps**	**S, N, A**	**4S**
d. 026 Containment Spray System **Manually Actuate Containment Spray System**	**S, P, D, A, EN**	**5**
e. APE 077 Generator Voltage and Electric Grid Disturbances Separate From the Electrical Grid Due to Low Grid Frequency	S, N, A	6
f. 015 Nuclear Instrumentation System Restore Repaired Power Range Channel to Service	S, P, M	7
g. 075 Circulating Water System Isolate the Circulating Water System During Turbine Building Flooding	S, N	8
h. *010 Pressurizer Pressure Control System* *Remove Pressurizer Heaters from Service*	*S, N, A*	*3*
In-Plant Systems@ (3 for RO; 3 for SRO-I; 3 or 2 for **SRO-U**)		
i. 039 Main and Reheat Steam System Control Steam Pressure Locally Using SM PORVs	D, E	4S
j. 008 Component Cooling Water System **Makeup to the Unit 1 KC Surge Tanks**	**D, R, E**	**8**
k. APE 057 Loss of Vital AC Electrical Instrument Bus Restore Power to KXB Power Panel Board Using Inverter SKX	**D, R, E**	**6**

@	All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.
* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 (5) /4-6 (4) / 2-3 (3)
(C)ontrol room	
(D)irect from bank	≤ 9 (6) /≤ 8 (6) / ≤ 4 (4)
(E)mergency or abnormal in-plant	≥ 1 (3) /≥ 1 (3) / ≥ 1 (2)
(EN)gineered Safety Feature	- / - / ≥ 1 (1) (Control Room System)
(L)ow-Power / Shutdown	≥ 1 (1) /≥ 1 (1) / ≥ 1 (1)
(N)ew or (M)odified from bank including 1(A)	≥ 2 (5) / ≥ 2 (4) / ≥ 1 (1)
(P)revious 2 exams	≤ 3 (2) / ≤ 3 (2)/ ≤ 2 (1) (Randomly Selected)
(R)CA	≥ 1 (2)/≥ 1 (2) / ≥ 1 (2)
(S)imulator	

JPM Summary

JPM A This is bank JPM-PS-NC-117. The operator will be told Unit 1 experienced a Loss of Coolant Accident six (6) hours ago, and that the plant is operating in the Cold Leg Recirculation mode. The operator will be directed to Transfer Recirculation to Hot Leg Recirc PER EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirculation). The operator will be expected to align the NI System to the Hot Leg Recirc Mode.

JPM B This is bank JPM PS-ND-183A. The operator will be told that Unit 1 is in Mode 5 with the NC System drained to approximately 10 inches, that 1A ND Pump is in service to all four Cold Legs, and that ND flow has suddenly increased. The operator will be directed to implement AP/1/A/5500/19 (Loss of ND or ND System Leakage). The operator will be expected to take manual action to control flow, but recognize that attempts to manually control the RHR HX Outlet Valve and the Bypass Valve are ineffective (Alternate Path). The operator will be expected to throttle ND flow to less than 3000 gpm using the Cold Leg injection valve(s) and position the ND Heat Exchanger Outlet Manual Loaders so that when these valves are repaired, the ND flow will not be affected.

JPM C This is a new JPM. The operator will be told that Unit 1 is operating at 90% power in preparation for a Condensate System Pump Swap. The operator will be directed to start the C Hotwell Pump, and place the A Hotwell Pump in standby, and then start the C Condensate Booster Pump and place the A Condensate Booster Pump in standby using Enclosure 4.5 of OP/1/A/6250/001 (Condensate and Feedwater System). The operator will be expected to swap both sets of pumps in accordance with the procedure. During the course of swapping the Condensate Booster Pumps, the operator will recognize that the C Hotwell Pump Strainer High ΔP Annunciator will alarm (Alternate Path). The operator will be expected to use the Annunciator Response Procedure and re-start the A Hotwell Pump, and stop the C Hotwell Pump.

JPM D This JPM is a bank JPM, and was previously used on the 2008 NRC Operating Test. The operator will be placed in a Post-Reactor Trip situation and told that the crew has progressed from EP/1/A/5000/E-0 (Reactor Trip and/or Safety Injection) to EP/1/A/5000/ES-0.1 (Reactor Trip Response) due to a reactor trip. The operator will be told that after entry into ES-0.1 a LOCA occurs inside the Containment causing a Safety

Injection; and that the crew has now left ES-0.1 for EP/1/A/5000/FR-Z.1 (Response to High Containment Pressure) due to the Orange Path condition on the Containment Critical Safety Function, completing steps 1-9. The operator will be directed to check the NS System in Operation in accordance with step 10 of FR-Z.1. Although Containment Pressure will be > 3 psig, automatic actuation of Containment Spray (NS) will have failed. Additionally, the NS manual actuators will fail to operate requiring that the operator take manual action to start the NS Pumps and open the discharge valves. The operator will need to manually open the NS Pump discharge valves and manually start the NS Pumps. When attempts are made to manually open the A Train discharge valves, they will not open (Alternate Path), requiring the operator to make no attempt to start the 1A NS pump.

JPM E This is a new JPM. With the plant at 77% power, the operator will be told that the crew has entered AP/1/A/5500/05 (Generator Voltage and Electrical Grid Disturbances) due to low Electrical Grid frequency, and that the procedure is completed up to Step 15. The operator will be directed to separate from the Electrical Grid without delay in accordance with Step 15 of AP/1/A/5500/05 (Generator Voltage and Electrical Grid Disturbances). Since plant power is greater than 60%, the operator will be required to reduce load. When the operator attempts to operate the turbine in automatic, Turbine power will fail to lower (Alternate Path). The operator will be expected to recognize that the Turbine has failed, and lower power manually, and then disconnect the Turbine Generator from the Electrical Grid.

JPM F This JPM is a modified version of a similar JPM used on the 2009 NRC Operating Test. The Operator will be placed in a situation with Unit 1 at 100% power. The operator will be told that Power Range Channel N43 has previously failed low, and that the channel has been defeated in accordance with AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation," Case III, "Power Range Malfunction." The operator will be asked to restore Power Range Channel N43 to service in accordance with Step 21 of AP16, "Malfunction of Nuclear Instrumentation," Case III, "Power Range Malfunction." The operator will be required to restore the channel to service in accordance with the procedure.

JPM G This is a new JPM. The operator will be told that there is massive flooding in the Turbine Building and that the crew has implemented AP/0/A/5500/44 (Plant Flooding), Enclosure 1 (Unit 1 Turbine Bldg Flooding). The operator will be directed to isolate the RC System by performing steps 6.d-v of the procedure, while the crew continues with EP/1/A/5000/E-0 (Reactor Trip and/or Safety Injection). The operator will be expected to take all pump and valve control switch manipulations to isolate the RC System. This task was chosen because Internal Flooding events are a large PRA contributor (15% CDF). This is a Time Critical JPM that must be complete in 40 Minutes.

JPM H This is a new JPM. The operator will be told that plant power has just been raised to 100% per OP/1/A/6100/003 (Controlling Procedure for Unit Operation). The operator will be directed to remove Pzr Heater Groups A, B and D from service per Enclosure 4.6 (Operation of Pzr Heaters) of OP/1/A/6100/003. The operator will be expected to remove the A, B and D Pzr Heater Groups from service in accordance with Step 3.4.4 of Enclosure 4.6. After the Pzr Pressure Master has been placed in MANUAL and its output has been adjusted, the Pzr variable Heaters (Group C) will fail (Alternate Path). The operator will be required to respond to MCB Annunciator 1AD6/D6 (PZR HTR CONTROLLER TROUBLE), and manually control pressure using the other heater

groups. The operator will be expected to place at least one Pzr Heater Group in service in accordance with Step 3.3.1 (or equivalent) of Enclosure 4.6.

JPM I This is Bank JPM STM-SM-107. The Operator will be told that a Loss of Control Room has occurred and AP/1/A/5500/17 (Loss of Control Room) has been implemented, that Steam Generator pressure is discovered to be 1185 psig, and the CRS desires to reduce pressure below the Safety Valve lift setpoint. The operator will be directed to locally control Steam Generator Pressure with the SM PORV's per AP/1/A/5500/17 (Loss of Control Room) Enclosure 7 (Manual Operation of PORVs). The operator will be expected to open 1SV-1 and 1SV-19 to 10% open and control their position from the Unit 1 exterior doghouse.

JPM J This is bank JPM PSS-KC-165T. The operator will be told that Unit 1 is operating at 100% power when the KC Surge Tank A and B lo level computer alarms are received, that the surge tank levels are 3.9 feet and decreasing, and that AP/1/A/5500/21 (Loss of KC or KC System Leakage) has been implemented. Since the YM System will be out of service, the operator will be directed to initiate makeup to both Unit 1 KC Surge Tanks per AP/1/A/5500/21 (Loss of KC or KC System Leakage), Enclosure 3 (Aligning RN Makeup to KC Surge Tank). This is a Time Critical JPM. The operator will be expected to manipulate valves, and communicate with the C/R to restore KC Surge Tank level within ten minutes of dispatch. This is a Time Critical JPM that must be complete in 10 Minutes.

JPM K This is bank JPM EL-EPK-199. The operator will be told that AP/1/A/5500/15 (Loss of Vital or Aux Control Power) has been implemented due to a loss of Aux Control Power Panel Board KXB, and that prior to the event, all electrical systems were aligned in their normal operating configurations. The operator will be directed to energize KXB using inverter SKX per Enclosure 24 of AP/1/A/5500/15 (Loss of Vital or Aux Control Power). The operator will be expected to align Inverter SKX to provide power to KXB power panel board.

SIM JPM A

Facility: McGuire Task No.:

Task Title: Transfer the NI Pumps from Cold Leg Recirc to Hot Leg Recirc JPM No.: 2010 Systems - Control Room JPM A

K/A Reference: 006, A4.01, 4.1/3.9

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

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

Initial Conditions: Unit 1 experienced a Loss of Coolant Accident six (6) hours ago.

Transfer to Cold Leg Recirculation (EP/1/A/5000/ES-1.3) is complete.

Task Standard: The NI System is realigned to the Hot Leg Recirc Mode.

Required Materials: None

General References: EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirc)
EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirc)

Handouts: EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirc)

Initiating Cue: The CRS has directed you to Transfer to Hot Leg Recirc PER EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirculation).

Time Critical Task: NO

Validation Time: 8 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset the Simulator to IC-20 (100% Power BOL)

2. Insert Malfunction NC0008A (Cold Leg LOCA)

3. From CAEP, open and run file ZZNIVLVI to restore power to the following valves:

   NI 162 - (L) NI 19, SET = Racked In
   NI 121 - (L) NI 22, SET = Racked In
   NI 152 - (L) NI 23, SET = Racked In
   NI 173 - (L) NI 24, SET = Racked In
   NI 178 - (L) NI 25, SET = Racked In

4. Insert LOA NI 26, SET = Racked In, to restore power to NI 183

5. Allow Accident to continue until the FWST Lo Level Alarm sounds and the Auto Transfer of ND to Cold Leg Recirc initiates

Note: To lower FWST to Lo Alarm level set: ASISRWST=800000 with "Monitor"

6. Complete the transfer to Cold Leg Recirc Per EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc)

Note: To lower FWST to Lo-Lo Alarm set: ASISRWST=210000 with "Monitor"

7. Allow the NS System to bring FWST level to the LO LO level setpoint then Transfer NS to Cold Leg Recirc

8. Freeze the Simulator

OR

1. Reset Simulator to Temporary Snap IC-241 (April, 2010).
2. REMOVE White Tag Stickers from the following Valves:
   - 1NI-121A
   - 1NI-162A
   - 1NI-150B
   - 1NI-152B
3. Momentarily place Simulator in Run to acknowledge alarms/Reset SLIMS.
4. Leave Simulator in FREEZE until operator is ready to begin.

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirc).

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
*1	(Step 1) Align NI flow path for Hot Leg Recirc: (Step 1.a) Stop 1A NI Pump.	The operator depresses the 1A NI Pump STOP pushbutton and observes the Green status light LIT, Red status light OFF. The operator observes motor amps go to 0, and pump flow (1NIP-5450) lower to 0.		
*2	(Step 1.b) Close 1NI-118A (Train A NI to Cold Leg Isol).	The operator depresses the 1NI-118A CLOSE pushbutton and observes Green status light LIT, Red status light OFF.		
3	(Step 1.c) Check 1NI-118A (Train A NI to Cold Leg Isol) – CLOSED.	The operator observes the 1NI-118A Green status light LIT, Red status light OFF.		
*4	(Step 1.d) Open 1NI-121A (Train A NI to B &C Hot Leg)	The operator depresses the 1NI-121A OPEN pushbutton and observes Red status light LIT, Green status light OFF.		
5	(Step 1.e) Check 1NI-121A (Train A NI to B &C Hot Leg) – OPEN.	The operator observes the 1NI-121A Red status light LIT, Green status light OFF.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*6	(Step 1.f) Start 1A NI Pump.	The operator depresses the 1A NI Pump START pushbutton and observes the Red status light LIT, Green status light OFF. The operator observes motor amps rise, peak and stabilize, and pump flow (1NIP-5450) rise to ≈440 gpm.		
*7	(Step 1.g) Stop 1B NI Pump.	The operator depresses the 1B NI Pump STOP pushbutton and observes the Green status light LIT, Red status light OFF. The operator observes motor amps go to 0, and pump flow (1NIP-5120) lower to 0.		
*8	(Step 1.h) Close 1NI-150B (Train B NI to Cold Leg Isol).	The operator depresses the 1NI-150B CLOSE pushbutton and observes Green status light LIT, Red status light OFF.		
*9	(Step 1.i) Close 1NI-162A (NI Pumps Cold Leg Isol).	The operator depresses the 1NI-162A CLOSE pushbutton and observes Green status light LIT, Red status light OFF.		
*10	(Step 1.j) Open 1NI-152B (Train B NI to A & D Hot Leg).	The operator depresses the 1NI-152B OPEN pushbutton and observes Red status light LIT, Green status light OFF.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	(Step 1.k) Check if 1B NI Pump should be started: • 1NI-150B (Train B NI to Cold Leg Isol) - CLOSED • 1 NI-152B (Train B NI to A & D Hot Leg) - OPEN	The operator observes the 1NI-150B Green status light LIT, Red status light OFF. The operator observes the 1NI-152B Red status light LIT, Green status light OFF.		
*12	(Step 1.l) Start NI Pump 1B.	The operator depresses the 1B NI Pump START pushbutton and observes the Red status light LIT, Green status light OFF. The operator observes motor amps rise, peak and stabilize, and pump flow (1NIP-5120) rise to ≈450.		
13	(Step 1.m) Check the following windows on ESF Monitor Light Panel, Group 5 - LIT: • A-1 "1NI-118A TRAIN A NI TO CL ISOL CLOSED" • B-1 "1NI-121A TRAIN A NI TO HL ISOL OPEN" • A-8 "1NI-150 TRAIN B NI TO CL ISOL CLOSED" • A-3 "1NI-162A NI PUMPS COLD LEG ISOL CLOSED" • B-8 "1NI-152 TRAIN B NI TO HL ISOL OPEN"	The operator observes that each of the ESF Monitor Light Panel windows are LIT.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
14	(Step 2) Check flow from at least one train of NI - ESTABLISHED.	The operator observes that flow meter for 1A (1NIP-5450) indicates ≈ 450 gpm. The operator observes that flow meter for 1B (1NIP-5120) indicates ≈ 440 gpm.		
15	(Step 3) RETURN TO procedure and step in effect	The operator reports to the CRS that the procedure is complete.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems - Control Room JPM A

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS: Unit 1 experienced a Loss of Coolant Accident six (6) hours ago.

Transfer to Cold Leg Recirculation (EP/1/A/5000/ES-1.3) is complete.

INITIATING CUE: The CRS has directed you to Transfer to Hot Leg Recirc PER EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirculation).

A. Purpose

This procedure provides the necessary instructions for transferring the Safety Injection System to Hot Leg Recirc.

B. Symptoms or Entry Conditions

This procedure is entered from:

- EP/1/A/5000/E-1 (Loss Of Reactor Or Secondary Coolant), Step 20 when the specified time interval has elapsed.
- RP/0/A/5700/026 (Operations/Engineering Required Actions In The Technical Support Center (TSC)), when a decision has been made by the TSC that transfer to Hot Leg Recirc is required. Transfer to Hot Leg Recirc may be required, eventually, after transferring to Cold Leg Recirc during the implementation of:
  a. EP/1/A/5000/ES-1.2 (Post LOCA Cooldown And Depressurization).
  b. EP/1/A/5000/ECA-3.1 (SGTR With Loss Of Reactor Coolant - Subcooled Recovery Desired).
  c. EP/1/A/5000/ECA-3.2 (SGTR With Loss Of Reactor Coolant - Saturated Recovery Desired).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

C. Operator Actions

1. **Align NI flow path for Hot Leg Recirc as follows:**

__ a. Stop 1A NI Pump.

__ b. Close 1NI-118A (Train A NI To Cold Leg Isol).

__ c. Check 1NI-118A (Train A NI To Cold Leg Isol) - CLOSED.

c. Perform the following:

__ 1) **IF** 1NI-118A is in intermediate position, **THEN** wait up to 30 seconds for valve to complete valve movement.

__ 2) **IF** 1NI-118A is closed, **THEN GO TO** Step 1.d.

__ 3) **IF** 1NI-118A will not close, **THEN GO TO** Step 1.g.

__ d. Open 1NI-121A (Train A NI To B & C Hot Leg).

__ e. Check 1NI-121A (Train A NI To B & C Hot Leg) - OPEN.

e. Perform the following:

__ 1) **IF** 1NI-121A is in intermediate position, **THEN** wait up to 30 seconds for valve to complete valve movement.

__ 2) **IF** 1NI-121A is open, **THEN GO TO** Step 1.f.

__ 3) **IF** 1NI-121A will not open, **THEN GO TO** Step 1.g.

__ f. Start 1A NI Pump.

__ g. Stop 1B NI Pump.

__ h. Close 1NI-150B (Train B NI To Cold Leg Isol).

__ i. Close 1NI-162A (NI Pumps Cold Leg Isol).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

1. (Continued)

__ j. Open 1NI-152B (Train B NI To A & D Hot Leg).

k. Check if 1B NI Pump should be started:

__ • 1NI-150B (Train B NI To Cold Leg Isol) - CLOSED

__ • 1NI-152B (Train B NI To A & D Hot Leg) - OPEN.

k. Perform the following:

__ 1) **IF** valve(s) in intermediate position, **THEN** wait up to 30 seconds to allow valves to complete valve movement.

__ 2) **IF** valves are properly aligned, **THEN GO TO** Step 1.l.

__ 3) **IF** either valve fails to go to its required position, **THEN GO TO** Step 1.m.

__ l. Start 1B NI Pump.

m. Check the following windows on ESF Monitor Light Panel, Group 5 - LIT:

__ • A-1 "1NI-118A TRAIN A NI TO CL ISOL CLOSED"

__ • B-1 "1NI-121A TRAIN A NI TO HL ISOL OPEN"

__ • A-8 "1NI-150 TRAIN B NI TO CL ISOL CLOSED"

__ • A-3 "1NI-162A NI PUMPS COLD LEG ISOL CLOSED"

__ • B-8 "1NI-152 TRAIN B NI TO HL ISOL OPEN".

__ m. Notify station management of valve positions.

__ 2. **Check flow from at least one train of NI - ESTABLISHED.**

Perform the following:

__ a. Notify station management that NI flow not indicated.

__ b. **IF** both trains of NI have failed to operate in Hot Leg Recirc mode, **THEN GO TO** Step 4.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

__ 3. **RETURN TO procedure and step in effect.**

4. **Align ND S/I flow path for Hot Leg Recirc as follows:**

a. Check the following valves - CLOSED:

__ • 1ND-1B (1C NC Loop to ND Pumps Isol)

__ • 1ND-2AC (1C NC Loop To ND Pumps Cont Inside Isol)

__ • 1ND-30A (1A ND To 1B & 1C NC Hotlegs Isol)

__ • 1ND-15B (1B ND To 1B & 1C NC Hot Legs Isol).

a. Perform the following:

__ 1) Contact station management to evaluate guidance to align NI or ND for Hot Leg Recirc.

__ 2) **RETURN TO** procedure and step in effect.

__ b. Open 1NI-183B (U1 ND to B & C Hot Leg Cont Outside Isol).

b. Perform the following:

__ 1) Contact station management to evaluate guidance to align NI or ND for Hot Leg Recirc.

__ 2) **RETURN TO** procedure and step in effect.

c. For A ND train:

__ 1) Check 1NS-43A (1A ND Hx Outlet to NS Cont Outside Isol) - CLOSED.

__ 1) **GO TO** Step 4.d.

__ 2) Close 1NI-173A (1A ND to A & B Cold Legs Cont Outside Isol).

__ 2) **GO TO** Step 4.d.

__ 3) Open 1ND-30A (1A ND To 1B & 1C NC Hotlegs Isol).

__ 3) Open 1NI-173A.

4) Check the following windows on ESF Monitor Light Panel, Group 5 - LIT:

__ 4) Notify station management of valve positions.

__ • A-6 "1NI-183B ND TO HL B & C ISOL OPEN"

__ • A-2 "1NI-173A TRAIN A ND TO CL A & B CLOSED".

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

4. (Continued)

d. For B ND train:

__ 1) Check 1NS-38B (1B ND Hx Outlet to NS Cont Outside Isol) - CLOSED.	__ 1) **GO TO** Step 5.
__ 2) Close 1NI-178B (1B ND to C & D Cold Legs Outside Isol).	__ 2) **GO TO** Step 5.
__ 3) Open 1ND-15B (1B ND To 1B & 1C NC Hot Legs Isol).	__ 3) Open 1NI-178B.
4) Check the following windows on ESF Monitor Light Panel, Group 5 - LIT:	__ 4) Notify station management of valve positions.
__ • A-6 "1NI-183B ND TO HL B & C ISOL OPEN"	
__ • A-7 "1NI-178B TRAIN B ND TO CL C & D CLOSED".	

__ 5. **Check flow to NC hot legs from at least one train of ND - ESTABLISHED.**	__ **Contact station management to evaluate guidance to align NI or ND for Hot Leg Recirc.**
__ 6. **RETURN TO procedure and step in effect.**	

END

SIM JPM B

Facility:	McGuire	Task No.:	
Task Title:	Respond to ND System Malfunction While at Mid Loop	JPM No.:	2010 Systems - Control Room JPM B (Alternate Path)
K/A Reference:	005, A4.01, 3.6/3.4		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

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

Initial Conditions:
- Unit 2 is at 100% power.
- Unit 1 is in Mode 5 with the NC System drained to approximately 10 inches.
- 1A ND Pump is in service to all four Cold Legs.
- ND flow has suddenly increased.

Task Standard: The "A" ND Train flow is throttled to less than 3000 gpm using 1NI-173 and 1NI-178; and positions the Manual Loaders for the 1A and 1B ND Heat Exchanger Outlets valves to full Open.

Required Materials: None

General References:
- OP/1/A/6100/SD-20 (Draining the NC System)
- AP/1/A/5500/19 (Loss of ND or ND System Leakage)

Handouts: AP/1/A/5500/19 (Loss of ND or ND System Leakage)

Initiating Cue:	The CRS has directed you to implement AP/1/A/5500/19 (Loss of ND or ND System Leakage) **AND** control ND flow so that NC Temperature is maintained at its present temperature.
Time Critical Task:	NO
Validation Time:	8 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset to IC-01

2. Insert OVERRIDE/TRANSMITTERS:

   A. XMT-NC008 (LNC_5991 NC SYS N/R LVL) = 10

   B. XMT-NC009 (LNC_8470 NC LOOP A ULTRASONIC LEVEL) = 10

   C. XMT-NC010 (LNC_8460 NC LOOP C ULTRASONIC LEVEL) = 10

   D. XMT-NC007 (LNC_5990 NC SYS W/R LVL) = 10

3. Insert MAL ND005B (ND Heat Exchanger Outlet Or Bypass Valve 1ND29) = 100
   Insert MAL ND005C (ND Heat Exchanger Outlet Or Bypass Valve 1ND34) = 100

4. Place OAC point M1P0828 (U1 AVG of FIVE HOTEST I/C THERMOCOUPLES) on 10 Minute trend.

5. Stabilize Incore Thermocouple temperature.

6. Freeze Simulator

7. Remove Red Tag stickers from the following Valves:

   - 1NI-173A
   - 1NI-178B

OR

1. Reset to IC-242 (April, 2010)

2. REMOVE Red Tag Stickers from the following Valves:
   - 1NI-173A
   - 1NI-178B

3. Momentarily place Simulator in Run to acknowledge alarms/Reset SLIMS.

4. Leave Simulator in FREEZE until operator is ready to begin.

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout AP/1/A/5500/19.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Step 1) Check ND pumps – ANY RUNNING.	The operator observes the 1A ND Pump Red status light LIT, Green status light OFF, and motor amps to be ≈70 amps; and determines that the 1A ND Pump is running.		
2	(Step 2) Check if ND pumps should remain running: (Step 2.a) NC level - GREATER THAN 4 INCHES.	The operator observes one or more of the following instruments: • 1NCP-5991 NC SYS N/R LVL • 1NCP-8470 NC LOOP A ULTRASONIC LEVEL • 1NCP-8460 NC LOOP C ULTRASONIC LEVEL • 1NCP-5990 NC SYS W/R LVL And determines that NC Level is ≈10 inches.		
3	(Step 2.b) Check NC subcooling based on core exit T/C's – GREATER THAN 0°F.	The operator observes the NC Subcooling Monitors (Train A or Train B) and determines that NC Subcooling is ≈115°F.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	(Step 2.c) Check the following valves – OPEN • 1ND-1B (1C NC Loop To ND Pumps Isol) • 1ND-2AC (1C NC Loop to ND Pumps Cont Inside Isol)	The operator observes 1ND -1B and 1ND-2AC on the OAC (ND Graphic), seeing that they are Red, determines that both valves are open. **Note:** **Both breaker status lights are OFF since the valves are de-energized in this mode.**		
5	(Step 2.d) IF AT ANY TIME NC level goes below 4 inches OR NC subcooling based on core exit T/Cs goes below 0^0F, THEN	The operator reads the step, which is a continuous action step, and proceeds. **Note:** **It is not expected that the conditions for this continuous action step will be met during the performance of this JPM.**		
6	(Step 3) Check NC level - LESS THAN 15 INCHES (TOP OF HOT LEG).	The operator observes one or more of the following instruments: • 1NCP-5991 NC SYS N/R LVL • 1NCP-8470 NC LOOP A ULTRASONIC LEVEL • 1NCP-8460 NC LOOP C ULTRASONIC LEVEL • 1NCP-5990 NC SYS W/R LVL And determines that NC Level is ≈10 inches.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	(Note prior to Step 4) ND flow control valves fail open on a loss of air.	The operator reads the Note, and proceeds. **Note:** **A common air line failure has caused both 1ND29 (ND Heat Exchanger Outlet Or Bypass Valve) and 1ND34 (ND Heat Exchanger Outlet Or Bypass Valve) to fail open.**		
8	(Step 4) Check ND Flow control: (Step 4.a) Check total ND system flow – GREATER THAN 3000 GPM.	The operator observes total ND system flow by observing 1NDP-5191(C & D Cold Leg) to be ≈2175 gpm, and 1NDP-5181 (A & B Cold Leg) to be ≈2325 gpm; and determines that ND system flow is ≈4500 gpm.		
9	(Step 4.b) Throttle the following valves as necessary to reduce ND System to less than 3000 GPM: • 1ND-14 (1B ND Hx Outlet Isol) • 1ND-29 (1A ND Hx Outlet Isol) • 1ND-34 (1A & 1B ND Hx Byp Isol)	The operator attempts to adjust the position of both 1ND-29 and 1ND-34 by adjusting the controller. The operator observes that controller adjustments do NOT impact total ND System flow still indicates ≈4500 gpm, and proceeds to Step 4.b RNO **(Alternate Path)**.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*10	(Step 4.b RNO) Perform the following: (Note prior to Step 4.b RNO b.1) When throttling closed 1NI-173A or 1NI-178B, the seal –in circuit may cause the valve to fully close before a drop in flow is seen. If the valve inadvertently closes, it may be pulsed open to the desired flow. (Step 4.b RNO b.1) Throttle the following valves as necessary to reduce ND System to less than 3000 GPM: • 1NI-173A (1A ND to A & B Cold Legs Cont Outside Isol) • 1NI-178B (1B ND to C & D Cold Legs Cont Outside Isol)	The operator reads the Note and proceeds. The operator may observe MCB flow indications, or flow on OAC (ND Screen). The operator depresses the 1NI-173A/1NI-178B Close pushbutton and observes a reduction in flow rate to the Cold Legs (operator should be monitoring this parameter while throttling and both valves already have red and green lights LIT due to being in a "throttled" position). **Note:** **The critical task is to reduce total flow to less than 3000 GPM. Operator may throttle one or both of the valves.** The operator observes total flow (1NDP-5181 and 1NDP-5191) to be less than 3000 gpm.		
11	(Step 4.b RNO b.2) IF ND Pump(s) cavitating, THEN:.....	The operator checks for an oscillation in flow, motor amps and pressure, then determines ND pump is <u>not cavitating</u>, and proceeds to RNO step 4.b.3.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*12	(Step 4.b RNO b.3) Place the following manual loaders in the full open position: • 1ND-29 (1A ND Hx Outlet Isol) • 1ND-14 (1B ND Hx Outlet Isol)	The operator rotates the 1ND-29 manual loader counter-clockwise until the needle is at 100%. The operator rotates the 1ND-14 manual loader counter-clockwise until the needle is at 100%. **Note:** **The critical task is to OPEN at least one of the two Manual Loaders.**		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems - Control Room JPM B

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

Initial Conditions:

Unit 2 is at 100% power.

Unit 1 is in Mode 5 with the NC System drained to approximately 10 inches.

1A ND Pump is in service to all four Cold Legs.

ND flow has suddenly increased.

INITIATING CUE:

The CRS has directed you to implement AP/1/A/5500/19 (Loss of ND or ND System Leakage) **AND** control ND flow so that NC Temperature is maintained at its present temperature.

A. Purpose

To identify the appropriate actions in the event of a loss of the ND System or a leak on the ND System.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

B **Symptoms**

ND pump tripped

Known ND System leak

"A (B) ND PUMP LO FLOW TO COLD LEGS" Alarm

"A (B) ND PUMP DISCHARGE HI PRESS" Alarm

ND pump low discharge pressure OAC alarm

Core exit T/Cs high temperature OAC alarm

"NC SYSTEM LO LEVEL" OAC alarm

ND flow low OAC alarm.

Containment Sump level going up

Refueling Cavity level going down

ND pump flow going up

NC System level going down

NC System pressure going down

Oscillating ND pump motor amps.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

C. Operator Actions

CAUTION **Changes in NC pressure could result in inaccuracies in NC Level indications.**

__ 1. **Check ND pumps - ANY RUNNING.**

__ **GO TO Step 5.**

2. **Check if ND pumps should remain running:**

__ a. NC Level - GREATER THAN 4 INCHES.

a. Perform the following:

__ 1) Stop ND pumps.

2) CLOSE the following valves:

__ • CLOSE 1ND-30A (1A ND To 1B & 1C NC Hotlegs Isol)

__ • CLOSE 1ND-33 (1A ND Hx Byp Isol)

__ • CLOSE 1ND-18 (1B ND Hx Bypass)

__ • CLOSE 1ND-15B (1B ND To 1B & 1C NC Hot Legs Isol).

__ 3) **GO TO** Step 5.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

2. (Continued)

__ b. Check NC subcooling based on core exit T/Cs - GREATER THAN 0°F.

b. Perform the following:

__ 1) Stop ND pump(s).

__ 2) Ensure all NC pumps off.

3) CLOSE the following valves:

__ • CLOSE 1ND-30A (1A ND To 1B & 1C NC Hotlegs Isol)

__ • CLOSE 1ND-33 (1A ND Hx Byp Isol)

__ • CLOSE 1ND-18 (1B ND Hx Bypass)

__ • CLOSE 1ND-15B (1B ND To 1B & 1C NC Hot Legs Isol).

__ 4) **GO TO** Step 5.

c. Check the following valves - OPEN:

__ • 1ND-1B (1C NC Loop to ND Pumps Isol)

__ • 1ND-2AC (1C NC Loop To ND Pumps Cont Inside Isol).

c. Perform the following:

__ 1) Stop ND pump(s).

__ 2) **GO TO** Step 5.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

2. (Continued)

d. **IF AT ANY TIME** NC level goes below 4 inches **OR** NC subcooling based on core exit T/Cs goes below 0°F, **THEN** perform the following:

__ 1) Stop ND pump(s).

2) CLOSE the following valves:

__ • CLOSE 1ND-30A (1A ND To 1B & 1C NC Hotlegs Isol)

__ • CLOSE 1ND-33 (1A ND Hx Byp Isol)

__ • CLOSE 1ND-18 (1B ND Hx Bypass)

__ • CLOSE 1ND-15B (1B ND To 1B & 1C NC Hot Legs Isol).

__ 3. **Check NC level - LESS THAN 15 INCHES (TOP OF HOT LEG).**

Perform the following:

__ a. **IF AT ANY TIME** NC level is less than 15 inches, **THEN** observe Note prior to Step 4 and perform Step 4.

__ b. **GO TO** Step 5.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE ND flow control valves fail open on a loss of air.

4. **Check ND flow control:**

__ a. Check total ND System flow - GREATER THAN 3000 GPM.

__ a. **GO TO** Step 4.c.

b. THROTTLE the following valves as necessary to reduce ND System to less than 3000 GPM:

__ • 1ND-14 (1B ND Hx Outlet Isol)

__ • 1ND-29 (1A ND Hx Outlet Isol)

__ • 1ND-34 (1A & 1B ND Hx Byp Isol).

b. Perform the following:

NOTE When throttling closed 1NI-173A or 1NI-178B, the seal-in circuit may cause the valve to fully close before a drop in flow is seen. If the valve inadvertently closes, it may be pulsed open to the desired flow.

1) THROTTLE the following valves as necessary to reduce ND System to less than 3000 GPM:

__ • 1NI-173A (1A ND to A & B Cold Legs Cont Outside Isol)

__ • 1NI-178B (1B ND to C & D Cold Legs Outside Isol).

2) **IF** ND pump(s) cavitating, **THEN** perform the following:

__ a) Stop ND pump(s)

__ b) **GO TO** Step 5.

3) Place the following manual loaders in the full OPEN position:

__ • 1ND-29 (1A ND Hx Outlet Isol)

__ • 1ND-14 (1B ND Hx Outlet Isol).

__ 4) **GO TO** Step 4.f.

SIM JPM C

Facility: McGuire Task No.:

Task Title: Swap Hotwell/CM Booster Pumps JPM No.: 2010 Systems - Control Room JPM C (Alternate Path)

K/A Reference: 056, A2.04, 2.6/2.8

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

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

Initial Conditions: Unit 1 is operating at 90% power in preparation for a Condensate System Pump Swap.

The A and the B Hotwell Pumps are running, with the C Hotwell Pump in Standby.

The A and the B Condensate Booster Pumps are running, with the C Condensate Booster Pump in Standby.

To support maintenance activities, it is desired to swap Condensate System Pumps.

U-1 TB Rounds NEO (Bob) is standing by via radio, and has reported that the 1C Hotwell Pump and the 1C CM Booster Pump have been checked out and both are "ready to start, and all operating parameters are normal."

Task Standard: The operator will start the C Hotwell Pump, and place the A Hotwell Pump in standby. Then, the operator will start the C Condensate Booster Pump, and place the A Condensate Booster Pump in standby. The operator will then respond to an ARP, requiring that the A Hotwell Pump be restarted and the C Hotwell Pump removed from service.

Required Materials: None

General References:	OP/1/A/6250/001 (Condensate and Feedwater System) OP/1/A/6100/010 I (Annunciator Response for Panel 1AD-8), Window A3, HTWL PUMP C STRNR HI D/P SOMP 01-02 (Reactivity Management) OMP 8-1 (Star and Peer Checking)
Handouts:	Enclosure 4.5 (Swapping Hotwell/CM Booster Pumps) of OP/1/A/6250/001 (Condensate and Feedwater System) marked up for place-keeping through step 3.1.
Initiating Cue:	The CRS has directed you to start the C Hotwell Pump, and place the A Hotwell Pump in standby, and then start the C Condensate Booster Pump and place the A Condensate Booster Pump in standby using Enclosure 4.5 of OP/1/A/6250/001, Condensate and Feedwater System. All outstanding R&Rs that may have impacted the performance of this procedure have been evaluated.
Time Critical Task:	NO
Validation Time:	15 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-38, 90% power.
2. Place in RUN
3. Ensure both A and B Hotwell Pumps are running, and C Hotwell Pump is in Standby.
4. Ensure both A and B Condensate Booster Pumps are running, and C Condensate Booster Pump is in Standby.
5. Place XMT-CM011 = 4, 10 second Ramp, on Trigger #1.
6. Freeze the Simulator

OR

1. Reset to IC-243 (April, 2010)
2. Place Simulator in Run and acknowledge alarms/Reset SLIMS.

NOTE: **During the performance of this JPM, the simulator operator will need to operate Trigger #1 at the end of Step 14 of this JPM, after switch has been placed in AUTO, and then clear this malfunction at Step 16.**

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 4.5 (Swapping Hotwell/CM Booster Pumps) of OP/1/A/6250/001 marked up for place-keeping through step 3.1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Examiner Note: **Examine the operator ability to obtain a Controlled Copy of a procedure during this JPM (i.e. Using NEDL/Computer or Controlled Copy files and make a copy).**		
		Examiner Note: **Throughout JPM, If the operator provides information to the OATC, as OATC, acknowledge.**		
1	(Step 3.2) Perform the following Sections as applicable. Section 3.3, Swapping Hotwell Pumps Section 3.4, Swapping CM Booster Pumps	The operator proceeds to Section 3.3.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	(Step 3.3) Swapping Hotwell Pumps. (Note prior to Step 3.3.1) Starting a Hotwell Pump will cause an increase in condensate flow to the Steam Generators and result in an NC System temperature decrease (R.M.) * (Step 3.3.1) Start desired Hotwell Pump (R.M.) • 1A Hotwell Pump • 1B Hotwell Pump • 1C Hotwell Pump	The operator reads the Note and proceeds. The operator will make an announcement regarding the Pump start. The operator rotates the 1C Hotwell Pump control switch to the START position and observes the Red status light LIT, and Green status light OFF. The operator observes motor amps rise, peak, and then stabilize at ≈45 amps. **Booth Cue:** **If the operator contacts the NEO to check pump status, as NEO, report "The 1C Hotwell Pump is operating properly – all operating parameters normal."**		
3	(Note prior to Step 3.3.2) Securing an operating Hotwell pump will cause a decrease in condensate flow to the Steam Generators and result in an NC System temperature increase (R.M)	The operator reads the Note and proceeds.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*4	(Step 3.3.2) WHEN desired, place desired Hotwell Pump in STOP (R.M.) • 1A Hotwell Pump • 1B Hotwell Pump • 1C Hotwell Pump	The operator rotates the 1A Hotwell Pump control switch to the STOP position and observes the Green status light LIT, and Red status light OFF. The operator observes motor amps lower to 0 amps (NOTE: running pumps go to 75 amps).		
*5	(Step 3.3.3) Place non-operating Hotwell Pump in AUTO • 1A Hotwell Pump • 1B Hotwell Pump • 1C Hotwell Pump	The operator rotates the 1A Hotwell Pump control switch to the AUTO position. The operator returns to step 3.2.		
6	(Step 3.2) Perform the following Sections as applicable. Section 3.3, Swapping Hotwell Pumps Section 3.4, Swapping CM Booster Pumps	The operator proceeds to Section 3.4.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	(Step 3.4) Swapping CM Booster Pumps. (Note prior to Step 3.4.1) Swapping CM Booster Pumps at power operations will affect Reactor Thermal Power. Reactor Thermal Power should be less than 98% RTP to prevent exceeding 100% RTP during pump swap (R.M.) (Step 3.4.1) IF greater than or equal to 98% RTP, decrease Turbine load to reduce Reactor power to less than 98% RTP (R.M)	The operator reads the Note and proceeds. The operator recognizes that reactor power is 90%, and proceeds.		
8	(Step 3.4.2) Evaluate potential operational concerns related to swapping CM Booster Pumps on line. (R.M.)	The operator directs the SRO to Evaluate potential operational concerns related to swapping CM Booster Pumps on line. **Cue:** **The CRS acknowledges and initial's Step 3.4.2.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
9	(Step 3.4.3) Ensure Auxiliary Oil Pump operating on CM Booster Pump to be started: • 1A CM Booster Auxiliary Oil Pump • 1B CM Booster Auxiliary Oil Pump • 1C CM Booster Auxiliary Oil Pump	The operator contacts the NEO to check the Auxiliary Oil Pump running. **Booth Cue:** **As the NEO, report that the 1C CM Booster Auxiliary Oil Pump is running.**		
10	(Note prior to Step 3.4.4) Starting a CM Booster Pump will cause a increase in condensate flow to the Steam Generators and result in an NC System temperature decrease. (R.M.)	The operator reads the Note and proceeds.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	(Step 3.4.4) Start desired CM Booster Pump (R.M.)	The operator will make an announcement regarding the Pump start.		
*	• 1A CM Booster Pump • 1B CM Booster Pump • 1C CM Booster Pump	The operator rotates the 1C CM Booster Pump control switch to the START position and observes the Red status light LIT, and Green status light OFF. The operator observes motor amps rise, peak, and then stabilize at ≈90 amps.		
		Cue: **If the operator contacts the NEO to check pump status, as NEO, report "The 1C CM Booster Pump is operating properly – all operating parameters normal."**		
12	(Note prior to Step 3.4.5) Securing an operating CM Booster Pump will cause a decrease in condensate flow to the Steam Generators and result in an NC System temperature increase. (R.M.)	The operator reads the Note and proceeds.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*13	(Step 3.4.5) WHEN desired, place the desired CM Booster Pump in STOP (R.M.) • 1A CM Booster Pump • 1B CM Booster Pump • 1C CM Booster Pump	The operator rotates the 1A CM Booster Pump control switch to the STOP position and observes the Green status light LIT, and Red status light OFF. The operator observes motor amps lower to 0 amps.		
14 * *	(Step 3.4.6) Place non-operating CM Booster Pumps in AUTO. • 1A CM Booster Pump • 1B CM Booster Pump • 1C CM Booster Pump	The operator rotates the 1A CM Booster Pump control switch to the AUTO position. The operator addresses Annunciator Response Procedure for Panel 1AD-8, A3, HTWL PUMP C STRNR HI D/P **(Alternate Path)**.		
Simulator Instructor Note:		**Just after the operator places the 1A CM Booster Pump Control Switch to STOP, operate Trigger #1.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*15	(OP/1/A/6100/010 I, 1AD-8 A3, Step 1 (IA)) Start standby Hotwell Pump.	The operator depresses the 1A Hotwell Pump START Pushbutton and observes the Red status light LIT, and Green status light OFF. The operator observes motor amps rise, peak, and then stabilize at ≈45 amps. **Cue:** **If the operator reports the Immediate Actions to the CRS, as the CRS, direct the operator to take any immediate actions.**		
Simulator Instructor Note:		**Clear XMT-CM011 when operator takes the next action.**		
*16	(Step 2 (IA)) Remove C Hotwell Pump from Service	The operator depresses the 1C Hotwell Pump STOP Pushbutton and observes the Green status light LIT, and Red status light OFF. The operator observes motor amps lower to 0 amps.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems - Control Room JPM C

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

Unit 1 is operating at 90% power in preparation for a Condensate System Pump Swap.

The A and the B Hotwell Pumps are running, with the C Hotwell Pump in Standby.

The A and the B Condensate Booster Pumps are running, with the C Condensate Booster Pump in Standby.

To support maintenance activities, it is desired to swap Condensate System Pumps.

U-1 TB Rounds NEO (Bob) is standing by via radio, and has reported that the 1C Hotwell Pump and the 1C CM Booster Pump have been checked out and both are "ready to start, and all operating parameters are normal."

INITIATING CUE:

The CRS has directed you to start the C Hotwell Pump, and place the A Hotwell Pump in standby, and then start the C Condensate Booster Pump and place the A Condensate Booster Pump in standby using Enclosure 4.5 of OP/1/A/6250/001, Condensate and Feedwater System.

All outstanding R&Rs that may have impacted the performance of this procedure have been evaluated.

1. Limits and Precautions

✓1.1 This procedure is Reactivity Management related because it controls activities that can affect core reactivity by changing NC System temperature. (R.M.)

✓1.2 Minimum Hotwell Pump flow is 1700 gpm.

✓1.3 Minimum CM Booster Pump flow is 3000 gpm.

2. Initial Conditions

SLM 2.1 **IF** in Mode 1 **OR** 2, ensure reactivity management controls established per SOMP 01-02 (Reactivity Management). (R.M.)

NOTE: ✓• Starting Hotwell Pumps at low ambient temperatures can cause damage to motor stators due to moisture and will likely damage motor bearings due to cold oil. Checking OAC indications verifies internal heater operation. {PIPs 07-5209, 06-1673}

✓• **IF** the OAC is out of service, ambient air temperature can be checked with hand held thermometer in the vicinity of the Hotwell Pumps.

N/A 2.2 **IF** ambient air temperature at Hotwell Pumps is less than 32°F, ensure the following indicate greater than 32°F:

For 1A Hotwell Pump Motor:

_____ • M1A0439 (1A CM HWP Motor Stator Temp)
_____ • M1A0493 (1A Hotwell Pump Mtr Upper Thrust Brng Temp)
_____ • M1A0457 (1A HTWL Pmp Motor Upper Guide Bearing Temp)
_____ • M1A0475 (1A Hotwell Pump Motor Lwr Guide Brng Temp)

For 1B Hotwell Pump Motor:

_____ • M1A0445 (1B CM HWP Motor Stator Temp)
_____ • M1A0499 (1B Hotwell Pump Mtr Upper Thrust Brng Temp)
_____ • M1A0463 (1B HTWL Pmp Motor Upper Guide Bearing Temp)
_____ • M1A0481 (1B Hotwell Pump Motor Lwr Guide Brng Temp)

For 1C Hotwell Pump Motor:

_____ • M1A0456 (1C CM HWP Motor Stator Temp)
_____ • M1A0505 (1C Hotwell Pump Mtr Upper Thrust Brng Temp)
_____ • M1A0469 (1C HTWL Pmp Motor Upper Guide Bearing Temp)
_____ • M1A0487 (1C Hotwell Pump Motor Lwr Guide Brng Temp)

NOTE: ✓• Starting Condensate Booster Pumps at low ambient temperatures can cause damage to motor stators due to moisture and will likely damage motor/pump bearings due to cold oil. Checking OAC indications verifies internal heater operation. {PIPs 07-5209, 06-1673}

✓• **IF** the OAC is out of service, oil sump temperature can be checked using temperature gauge on top of reservoir or ambient air temperature can be checked with hand held thermometer in the vicinity of the Condensate Booster Pumps.

N/A per FSR 2.3 **IF** ambient air temperature at Condensate Booster Pumps is less than 50°F, ensure the following indicate greater than 50°F:

For 1A Condensate Booster Pump:

_____ • M1A0511 (1A CM Booster Pump Motor Stator Temp)
_____ • M1A0529 (1A CBP Mtr Opp Drv End (Frnt) Brg-TR Edge)
_____ • M1A0547 (1A CBP Drive End (Rear) Brg-TR Edge)
_____ • M1A0565 (1A CM Booster Pump Inboard Bearing Temp)
_____ • M1A0486 (1A CM Booster Pump Outboard Bearing Temp)
_____ • M1A0504 (1A CM Booster Pump Thrust Bearing Temp)

For 1B Condensate Booster Pump:

_____ • M1A0517 (1B CM Booster Pump Motor Stator Temp)
_____ • M1A0535 (1B CBP Mtr Opp Drv End (Frnt) Brg-TR Edge)
_____ • M1A0553 (1B CBP Drive End (Rear) Brg-TR Edge)
_____ • M1A0571 (1B CM Booster Pump Inboard Bearing Temp)
_____ • M1A0492 (1B CM Booster Pump Outboard Bearing Temp)
_____ • M1A0510 (1B CM Booster Pump Thrust Bearing Temp)

For 1C Condensate Booster Pump:

_____ • M1A0523 (1C CM Booster Pump Motor Stator Temp)
_____ • M1A0541 (1C CBP Mtr Opp Drv End (Frnt) Brg-TR Edge)
_____ • M1A0559 (1C CBP Drive End (Rear) Brg-TR Edge)
_____ • M1A0480 (1C CM Booster Pump Inboard Bearing Temp)
_____ • M1A0498 (1C CM Booster Pump Outboard Bearing Temp)
_____ • M1A0516 (1C CM Booster Pump Thrust Bearing Temp)

3. Procedure

☑ 3.1 Evaluate all outstanding R&Rs that may impact performance of this procedure.

3.2 Perform the following sections, as applicable:

☐ Section 3.3, Swapping Hotwell Pumps
☐ Section 3.4, Swapping CM Booster Pumps

3.3 Swapping Hotwell Pumps

NOTE: Starting a Hotwell pump will cause a increase in condensate flow to the steam generators and result in an NC System temperature decrease. (R.M.)

3.3.1 Start desired Hotwell Pump: (R.M.)

_____ • 1A Hotwell Pump
_____ • 1B Hotwell Pump
_____ • 1C Hotwell Pump

NOTE: Securing an operating Hotwell pump will cause a decrease in condensate flow to the steam generators and result in an NC System temperature increase. (R.M.)

_____ 3.3.2 **IF** required, place desired Hotwell Pump in "STOP": (R.M.)

_____ • 1A Hotwell Pump
_____ • 1B Hotwell Pump
_____ • 1C Hotwell Pump

3.3.3 Place non-operating Hotwell Pump in "AUTO":

_____ • 1A Hotwell Pump
_____ • 1B Hotwell Pump
_____ • 1C Hotwell Pump

3.4 Swapping CM Booster Pumps

NOTE: Swapping CM Booster Pumps at power operations will affect Reactor Thermal Power. Reactor Thermal Power should be less than 98% RTP to prevent exceeding 100% RTP during pump swap. (R.M.)

_____ 3.4.1 **IF** greater than or equal to 98% RTP, decrease Turbine load to reduce Reactor power to less than 98% RTP. (R.M.)

_____ SRO 3.4.2 Evaluate potential operational concerns related to swapping CM Booster Pumps on line. (R.M.)

3.4.3 Ensure Auxiliary Oil Pump operating on CM Booster Pump to be started:

- _____ 1A CM Booster Pump Auxiliary Oil Pump
- _____ 1B CM Booster Pump Auxiliary Oil Pump
- _____ 1C CM Booster Pump Auxiliary Oil Pump

NOTE: Starting a CM Booster pump will cause a increase in condensate flow to the steam generators and result in an NC System temperature decrease. (R.M.)

3.4.4 Start desired CM Booster Pump: (R.M.)

- _____ 1A CM Booster Pump
- _____ 1B CM Booster Pump
- _____ 1C CM Booster Pump

NOTE: Securing an operating CM Booster pump will cause a decrease in condensate flow to the steam generators and result in an NC System temperature increase. (R.M.)

_____ 3.4.5 **IF** required, place desired CM Booster Pump in "STOP": (R.M.)

- _____ 1A CM Booster Pump
- _____ 1B CM Booster Pump
- _____ 1C CM Booster Pump

3.4.6 Place non-operating CM Booster Pumps in "AUTO":

- _____ 1A CM Booster Pump
- _____ 1B CM Booster Pump
- _____ 1C CM Booster Pump

End of Enclosure

Unit 1

SIM JPM D

Facility: McGuire Task No.:

Task Title: Manually Actuate Containment Spray System JPM No.: 2010 Systems - Control Room JPM D (Alternate Path)

K/A Reference: 026 A2.03 4.1/4.4

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

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

Initial Conditions: With Unit 1 at 100% power a Reactor Trip occurs.

In response, the crew enters E-0, "Reactor Trip or Safety Injection," and then transitions to ES-0.1, "Reactor Trip Response."

Subsequently, a LOCA occurred inside the Containment causing a Safety Injection.

An Orange Path exists on the Containment Critical Safety Function Status Tree due to high Containment Pressure, and the crew has transitioned to FR-Z.1, "Response to High Containment Pressure," and completed actions through step 9.

Task Standard: Manually open the B Train NS Pump Discharge Containment Isolation Valves and start the 1B NS Pump.

Required Materials: None

General References: EP/1/A/5000/FR-Z.1 (Response to High Containment Pressure)

Handouts: EP/1/A/5000/FR-Z.1 (Response to High Containment Pressure) marked up for place-keeping through Step 9.

Initiating Cue:	The CRS has directed you to check the NS System in Operation in accordance with step 10 of FR-Z.1, "Response to High Containment Pressure."
Time Critical Task:	NO
Validation Time:	15 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-39, 100% Power
2. Place in RUN and allow time to stabilize
3. Insert Malfunctions ISE005A/B, NS System Actuation Auto Failure/Manual Failure
4. Insert Malfunctions NS003C/D (to 0), 1NS-29A and 1NS-32A remain closed
5. Manually trip the reactor
6. Perform the actions of EP/1/A/5000/E-0 up through step 5 and transition to ES-0.1.
7. After performing steps 1-11 in ES-0.1, insert Malfunction NC008A, Cold Leg Break Loop A.
8. Ensure Safety Injection actuates automatically and all equipment responds as expected with the exception of NS System
9. Ensure Orange Path on Containment exists due to High Containment Pressure.
10. Complete Steps 1-9 of FR-Z.1.
11. Ensure the BOP Switch is in Silence.
12. Freeze the Simulator

OR

1. Reset Simulator to Temporary Snap IC-244 (April, 2010).
2. Place Simulator in Run and acknowledge alarms/Reset SLIMS.

NOTE: **During the performance of the JPM, the Simulator Driver will be required to acknowledge spurious alarms unrelated to the task being performed.**

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout EP/1/A/5000/FR-Z.1 marked up for place-keeping through step 9.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 10) Check NS System in operation as follows: (Step 10.a) Check EP/1/A/5000/ECA-1.1 (Loss Of Emergency Coolant Recirc) – IN EFFECT. (Step 10.a RNO) GO TO Step 10.d.	The operator recognizes from Initial Conditions that ECA-1.1 is NOT in effect. The operator proceeds to Step 10.d.		
2	(Step 10.d) Check NS suction - ALIGNED TO FWST AS FOLLOWS: • Check 1NS-18A (1A NS Pump Suction From Cont Sump Isol) – CLOSED • Check 1NS-20A (1A NS Pump Suction From FWST Isol) - OPEN • Check 1NS-1B (1B NS Pump Suction From Cont Sump Isol) - CLOSED • Check 1NS-3B (1B NS Pump Suction From FWST Isol) - OPEN.	The operator observes the Green status light LIT. The operator observes the Red status light LIT. The operator observes the Green status light LIT. The operator observes the Red status light LIT.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	(Step 10.e) Check containment pressure - GREATER THAN 3 PSIG.	The operator observes four instruments above NS Pump controls (or equivalent) and determines Containment Pressure is > 9 PSIG.		
4	(Step 10.f) Check the following NS pump discharge valves - OPEN: 1NS-32A (1A NS Hx Outlet Cont Outside Isol). 1NS-29A (1A NS Hx Outlet Cont Outside Isol). 1NS-12B (1B NS Hx Outlet Cont Outside Isol). 1NS-15B (1B NS Hx Outlet Cont Outside Isol).	 The operator observes the Green status light LIT. The operator observes the Green status light LIT. The operator observes the Green status light LIT. The operator observes the Green status light LIT. The operator proceeds to the Step 10.f RNO.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	(Step 10.f RNO) Perform the following: (Step 10.f RNO 1) IF both NS trains aligned to FWST, THEN perform the following: (Step 10.f RNO 1)a) Open affected valve(s).	The operator recognizes that both trains of NS are aligned to the FWST, and proceeds. The operator attempts to open 1NS-32A by pressing the OPEN pushbutton, and recognizes valve does NOT open; the Green status light LIT. **(Alternate Path)** The operator attempts to open 1NS-29A by pressing the OPEN pushbutton, and recognizes valve does NOT open; the Green status light LIT. **(Alternate Path)**		
*		The operator attempts to open 1NS-12B by pressing the OPEN pushbutton, and observes the Red status light LIT.		
*		The operator attempts to open 1NS-15B by pressing the OPEN pushbutton, and observes the Red status light LIT.		
6	(Step 10.f RNO 1)b) IF all four valves are closed, THEN.....	The operator recognizes that two of four valves have opened and that the step does NOT apply.		
7	(Step 10.f RNO 1)c) GO TO Step 10.g.	The operator proceeds to step 10.g.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
8	(Step 10.g) Check NS pumps - ON.	The operator observes the Green status lights LIT for each NS pump, and proceeds to RNO.		
*9	(Step 10.g RNO 1) IF both trains aligned to the FWST, THEN perform the following: (Step 10.g RNO 1)a) Start pump(s) with available suction and discharge flowpaths.	The operator recognizes that the 1B NS Pump is the only pump with a suction and discharge flowpath and starts ONLY the 1B NS Pump by pressing the START pushbutton. **(Alternate Path)** The operator observes 1B NS Pump Red status light is LIT.		
10	(Step 10.g RNO 1)b) IF both pumps off, THEN.....	The operator recognizes that 1 of 2 pumps are running and that step does not apply.		
11	(Step 10.g RNO 1)c) GO TO Step 11.	The operator proceeds to step 11.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems - Control Room JPM D

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

With Unit 1 at 100% power a Reactor Trip occurs.

In response, the crew enters E-0, "Reactor Trip or Safety Injection," and then transitions to ES-0.1, "Reactor Trip Response."

Subsequently, a LOCA occurred inside the Containment causing a Safety Injection.

An Orange Path exists on the Containment Critical Safety Function Status Tree due to high Containment Pressure, and the crew has transitioned to FR-Z.1, "Response to High Containment Pressure," and completed actions through step 9.

INITIATING CUE:

The CRS has directed you to check the NS System in Operation in accordance with step 10 of FR-Z.1, "Response to High Containment Pressure."

A. Purpose

This procedure provides actions to respond to a high containment pressure.

B. Symptoms or Entry Conditions

This procedure is entered from EP/1/A/5000/F-0 (Critical Safety Function Status Trees) (Containment), on a red or orange condition.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

C. Operator Actions

N 1. **IF loss of emergency coolant recirc has occurred, THEN this procedure may be completed as time allows.**

✓ 2. **Monitor Foldout Page.**

✓ 3. **Stop all NC pumps.**

✓ 4. **Ensure all RV pumps are in manual and off.**

NOTE Operator may have been dispatched to close breakers in next step by EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection).

5. **Ensure operator dispatched to remove white tags and close the following breakers:**

   ✓ • 1EMXA-R2A (1A ND To A&B Cold Legs Cont Outside Isol Motor (1NI-173A)) (aux bldg, 750, FF-54, FF-55)

   ✓ • 1EMXB1-6B (1B ND To C&D NC Cold Leg Cont Outside Isol Motor (1NI-178B)) (aux bldg, 733, GG-55, GG-56).

✓ 6. **Check containment pressure - LESS THAN 15 PSIG.** — __ **GO TO Step 9.**

__ 7. **Check any NS pump - ON.** → ✓ **GO TO Step 9.**

NOTE The remainder of this EP may be completed with the priority of a yellow path EP. Completion of this EP should be delayed if faulted S/G has occurred, or other higher priority actions are required.

__ 8. **Perform the remainder of this EP as time allows.**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9. **Check containment isolation:**

✓ a. Check OAC - IN SERVICE.

a. Perform the following on energized train(s):

__ 1) **IF** Phase A or B valve is required open by another EP, **THEN** valve may be left open in next steps.

2) Check ESF Monitor Light Panel as follows:

__ • Ensure Group 1 Phase A valves are dark.

NOTE OAC driven summary lights in Group 4 will not work. Only valves with individual windows need to be checked in next step.

__ • Ensure Group 4 Phase A valves are lit.

__ 3) Ensure Phase A valves in EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 11 (Phase A Valve Checklist) are closed.

__ 4) Ensure Phase B valves in EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 12 (Phase B Valve Checklist) are closed.

__ 5) **GO TO** Step 10.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9. (Continued)

b. Check the following windows on Group 4 of ESF Monitor light Panel - LIT.

- ✓ C-3 "CONT ISOL PHASE A TRN A VLVS ALIGNED"
- ✓ C-6 "CONT ISOL PHASE A TRN B VLVS ALIGNED"
- ✓ G-4 "CONT ISOL PHASE B TRN A VLVS ALIGNED"
- ✓ G-5 "CONT ISOL PHASE B TRN B VLVS ALIGNED".

b. Establish containment isolation on energized train(s) as follows:

__ 1) **IF** Phase A or B valve is required open by another EP, **THEN** valve may be left open in next step.

__ 2) Check OAC Monitor Light Program ("MONL") for associated light, and close Phase A and B isolation valves as required.

10. **Check NS System in operation as follows:**

__ a. Check EP/1/A/5000/ECA-1.1 (Loss Of Emergency Coolant Recirc) - IN EFFECT.

__ b. Operate NS as directed by EP/1/A/5000/ECA-1.1 (Loss Of Emergency Coolant Recirc).

__ c. **GO TO** Step 11.

__ a. **GO TO** Step 10.d.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

10. (Continued)

d. Check NS suction - ALIGNED TO FWST AS FOLLOWS:

__ • Check 1NS-18A (1A NS Pump Suction From Cont Sump Isol) - CLOSED

__ • Check 1NS-20A (1A NS Pump Suction From FWST Isol) - OPEN

__ • Check 1NS-1B (1B NS Pump Suction From Cont Sump Isol) - CLOSED

__ • Check 1NS-3B (1B NS Pump Suction From FWST Isol) - OPEN.

d. Perform the following:

1) **IF** FWST level has remained greater than 33 inches ("FWST LEVEL LO-LO" alarm), **THEN** perform the following:

__ a) Align valves.
__ b) **GO TO** Step 10.e.

2) **IF** NS pump suction has been aligned in EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc), **THEN** perform the following:

a) **IF** 1NI-185A (1A ND Pump Suction From Cont Sump Isol) is open, **THEN** ensure the following:

__ (1) 1NS-20A (1A NS Pump Suction From FWST Isol) - CLOSED.
__ (2) 1NS-18A (1A NS Pump Suction From Cont Sump Isol) - OPEN.
__ (3) 1RN-134A (A NS Hx Inlet Isol) - OPEN.
__ (4) 1RN-137A (A NS Hx Outlet Isol) - THROTTLED TO 3600 GPM.

b) **IF** 1NI-184B (1B ND Pump Suction From Cont Sump Isol) is open, **THEN** ensure the following:

__ (1) 1NS-3B (1B NS Pump Suction From FWST Isol) - CLOSED.
__ (2) 1NS-1B (1B NS Pump Suction From Cont Sump Isol) - OPEN.
__ (3) 1RN-235B (B NS HX Inlet Isol) - OPEN.
__ (4) 1RN-238B (B NS Hx Outlet Isol) - THROTTLED TO 3600 GPM.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

10. (Continued)

__ e. Check containment pressure - GREATER THAN 3 PSIG.

__ e. **GO TO** Step 11.

f. Check the following NS pump discharge valves - OPEN:

__ • 1NS-32A (1A NS Hx Outlet Cont Outside Isol)

__ • 1NS-29A (1A NS Hx Outlet Cont Outside Isol)

__ • 1NS-12B (1B NS Hx Outlet Cont Outside Isol)

__ • 1NS-15B (1B NS Hx Outlet Cont Outside Isol).

f. Perform the following:

1) **IF** both NS trains aligned to FWST, **THEN** perform the following:

__ a) Open affected valve(s).

__ b) **IF** all four valves are closed, **THEN** establish NS **PER** Enclosure 2 (NS System CPCS Failures).

__ c) **GO TO** Step 10.g.

2) **WHEN** either alarm "CONT SUMP LEVEL GREATER THAN 3 FT" is lit on 1AD-14 or 1AD-15, **THEN** perform the following:

a) Open the following valves:

__ • 1NS-32A (1A NS Hx Outlet Cont Outside Isol)

__ • 1NS-29A (1A NS Hx Outlet Cont Outside Isol)

__ • 1NS-12B (1B NS Hx Outlet Cont Outside Isol)

__ • 1NS-15B (1B NS Hx Outlet Cont Outside Isol).

__ b) **IF** all four valves are closed, **THEN** establish NS **PER** Enclosure 2 (NS System CPCS Failures).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

10. (Continued)

__ g. Check NS pumps - ON.

g. Perform the following:

1) **IF** both NS trains aligned to FWST, **THEN** perform the following:

__ a) Start pump(s) with available suction and discharge flowpaths.

__ b) **IF** both pumps off, **THEN** establish NS **PER** Enclosure 2 (NS System CPCS Failures).

__ c) **GO TO** Step 11.

2) **WHEN** either alarm "CONT SUMP LEVEL GREATER THAN 3 FT" is lit on 1AD-14 or 1AD-15, **THEN** perform the following:

__ a) Start pump(s) with available suction and discharge flowpaths.

__ b) **IF** both pumps off, **THEN** establish NS **PER** Enclosure 2 (NS System CPCS Failures).

__ 11. **Check Phase B HVAC equipment PER Enclosure 3 (Phase B HVAC Equipment).**

12. **Check the following - CLOSED:**

__ • All MSIVs

__ • All MSIV bypass valves.

__ **Close valve(s).**

13. **Check steamlines intact:**

__ • All S/G pressures - STABLE OR GOING UP

__ • All S/Gs - PRESSURIZED.

__ **IF any S/G pressure going down in an uncontrolled manner OR any S/G depressurized, THEN isolate any faulted S/G(s) PER Enclosure 5 (Faulted S/G Isolation).**

SIM JPM E

Facility:	McGuire	Task No.:	
Task Title:	Separate from the Electrical Grid due to Low Grid Frequency	JPM No.:	2010 Systems - Control Room JPM E (Alternate Path)
K/A Reference:	APE 077, AA2.06, 3.4/3.5		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

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

Initial Conditions: Unit 1 is at 77% power, and Unit 2 is at 85% power.
Both crews have entered AP/1 (2)/A/5500/05 (Generator Voltage and Electrical Grid Disturbances) due to low Electrical Grid frequency.
AP/1/A/5500/05 (Generator Voltage and Electrical Grid Disturbances) has been completed up to Step 15.
Grid frequency has previously lowered to 58.4 Hz and remained there for several minutes.

Task Standard: The operator attempts to reduce load on the Turbine in Automatic, and when it fails, reduces load to less than 60% in MANUAL, then separates the Main Generator from the Grid.

Required Materials: None

General References: AP/1/A/5500/05 (Generator Voltage and Electrical Grid Disturbances)
AP/2/A/5500/05 (Generator Voltage and Electrical Grid Disturbances)
OP/1/A/6300/001 (Turbine Generator Load Change)
OP/1/A/6100/010 B (Annunciator Response for Panel 1AD-1)

Handouts:	AP/1/A/5500/05 (Generator Voltage and Electrical Grid Disturbances) marked up to Step 15.
Initiating Cue:	The CRS has directed you to separate from the Electrical Grid without delay in accordance with Step 15 of AP/1/A/5500/05 (Generator Voltage and Electrical Grid Disturbances).
Time Critical Task:	NO
Validation Time:	12 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset to IC # 37, 75% Power, MOL. Go to RUN.
2. Using PLP-15 adjust Electrical Grid Frequency to 58.6 Hz (Turbine will trip if < 58.5 HZ).
3. Carry out AP/1/A/5500/05 (Generator Voltage and Electrical Grid Disturbances), up to Step 15.
4. Insert ANN-AD01-F09 = 1 (OFF)
5. Insert MALF DEH-008B on Trigger #1.
6. Freeze Simulator.

OR

1. Reset Simulator to Temporary Snap IC-245 (April, 2010).
2. Momentarily place Simulator in Run to acknowledge alarms/Reset SLIMS.
3. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: Simulator Instructor take Simulator to "RUN" just prior to candidate starting JPM.

NOTE: Simulator Instructor will need to operate Trigger #1 during the course of this JPM (Step 9).

NOTE: Simulator Floor Instructor will need to be stationed at the Control Rods during the course of this JPM.

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout AP/1/A/5500/05 marked up to Step 15.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Step 15) Separate from the Grid as follows: (Step 15.a) Notify SOC that Unit 1 is separating from the Grid.	The operator calls SOC and notifies them that Unit 1 is separating from the Grid. **Cue:** **If operator calls SOC, as SOC, acknowledge.**		
2	(Step 15.b) Ensure control rods in auto.	The operator observes the Rod Control Select Switch is in the AUTO position.		
3	(Step 15.c) Check "TURB IMP PRESS CH 2" - GREATER THAN 340 PSIG.	The operator observes 1SMP-5220 and determines that Channel 2 Turbine Impulse Pressure is ≈ 520 psig.		
4	(Step 15.d) Check Turbine automatic control - AVAILABLE.	The operator observes the White Operator Auto Status light is LIT, and determines that Turbine automatic control is available.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	(Step 15.e) Ensure Turbine control in "OPERATOR AUTO."	The operator observes the White Operator Auto Status light is LIT, and determines that Turbine Control is in OPERATOR AUTO.		
6	(Step 15.f) Place "MW LOOP" in service.	The operator observes the Red MW IN Status light is LIT, and determines that MW Loop is in service.		
7	(Step 15.g) Enter target load of 300 MW.	The operator enters a target load of 300 MW by depressing the REFERENCE pushbutton, using the KEY Pad to select 300, and when it appears on the Digital Display, presses ENTER.		
8	(Step 15.h) Enter load rate of 300 MW/MIN.	The operator enters a load rate of 300 MW/min by depressing the LOAD RATE pushbutton, using the KEY Pad to select 300, and when it appears on the Digital Display, presses ENTER.		
9	(Step 15.i) Depress "GO".	The operator depresses the GO pushbutton and observes that the Pushbutton is LIT.		

Simulator Instructor Note:

When the operator presses "GO" on the Turbine Operate Trigger #1 (MALF-DEH008B) (Alternate Path)

This action will cause Main Control Board Annunciator Panel 1AD-1/F-4, TURBINE IN MANUAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*10	MCB Annunciator Panel 1AD-1 F4/TURBINE IN MANUAL	The operator recognizes that the Turbine will not operate in AUTO and operates the Turbine in MANUAL. **(Alternate Path)** **Cue:** **If operator requests guidance from CRS, indicate that the CRS is unavailable.** **Examiner Note:** **There is more than one success path for the operator. The operator may back up in AP/1/A/5500/05 to Step 15.d, and recognize that the Turbine Automatic Control is no longer available. If so, they will respond by implementing the Step 15.d RNO. This path is scripted in JPM Steps 11-15.** **As an alternative to this, the operator may use the ARP for MCB Annunciator 1AD-1/F4, TURBINE IN MANUAL, which will direct the operator to reduce load in Manual in accordance with OP/1/A/6300/001 A (Turbine Generator Load Change), Enclosure 4.1 (Turbine Generator Load Change) Section 3.5.2. These steps will accomplish the same actions as JPM Steps 11-15.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	(Step 15.d RNO) Perform the following: (Step 15.d.1) Ensure Turbine in "MANUAL" control.	The operator observes White MANUAL Status light is LIT, and determines that the Turbine Control is in MANUAL.		
*12	(Step 15.d.2) Immediately lower Turbine load to less than 300 MW using "GV LOWER".	The operator depresses the GV Lower pushbutton.		
13	(Step 15.d.3) WHEN PCBs are opened to separate from the Grid in step 15.l, THEN use "GV LOWER" and "GV RAISE" to maintain 1800 RPM.	The operator reads the step and proceeds.		
14	(Step 15.d.4) GO TO Step 15.j.	The operator proceeds to Step 15.j.		
*15	(Step 15.j) Do not continue until the following conditions are met: • "TURB IMP PRESS CH 2" – LESS THAN 340 PSIG • P/R meters - LESS THAN 60%.	The operator lowers load until Channel 2 Turbine Impulse Pressure (1SMP-5220) is less than 340 psig, AND the Power Range Meters indicate less than 60%.		
*16	(Step 15.k) Notify Unit 2 Operator that Unit 1 is separating from the Grid.	The operator notifies the Unit 2 RO that Unit 1 is ready to be separated from the Grid. **Cue:** **As the U2 RO, acknowledge.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*17	(Step 15.l) Open the following Switchyard PCBs: • PCB-8	The operator depresses the OPEN pushbutton for PCB-8, and observes the Green status light LIT, Red status light OFF.		
	• PCB-9	The operator depresses the OPEN pushbutton for PCB-9, and observes the Green status light LIT, Red status light OFF.		
	• PCB-11	The operator depresses the OPEN pushbutton for PCB-11, and observes the Green status light LIT, Red status light OFF.		
	• PCB-12	The operator depresses the OPEN pushbutton for PCB-12, and observes the Green status light LIT, Red status light OFF.		
18	(Step 15.m) GO TO AP/1/A/5500/03 (Load Rejection.	The operator reports that the Generator is separated from the Grid, and that the crew must proceed to AP/1/A/5500/3.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems - Control Room JPM E

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

Unit 1 is at 77% power, and Unit 2 is at 85% power.

Both crews have entered AP/1 (2)/A/5500/05 (Generator Voltage and Electrical Grid Disturbances) due to low Electrical Grid frequency.

AP/1/A/5500/05 (Generator Voltage and Electrical Grid Disturbances) has been completed up to Step 15.

Grid frequency has previously lowered to 58.4 Hz and remained there for several minutes.

INITIATING CUE:

The CRS has directed you to separate from the Electrical Grid without delay in accordance with Step 15 of AP/1/A/5500/05 (Generator Voltage and Electrical Grid Disturbances).

A. Purpose

This procedure provides guidance on how to respond to Main Generator voltage regulator malfunctions and to voltage and/or frequency disturbances on the Electrical Grid.

B. Symptoms

OAC alarm on Hi Generator voltage

OAC alarm on Hi Generator MVARs

OAC alarm on Lo Generator MVARs

OAC alarm on Generator frequency

OAC alarm on Lo Switchyard voltage

Generator voltage and MVARs fluctuating (swinging)

Generator Capability Curve Exceeded

"EXCITATION LIMITER IN ACTION" alarm.

TCC notification that the "Real Time Contingency Analysis" (RTCA) indicates that switchyard voltage would not be adequate should the unit trip

TCC notification that the "Real Time Contingency Analysis" (RTCA) indicates that switchyard voltage would not be adequate if further grid degradation occurs

TCC notification that the "Real Time Contingency Analysis" (RTCA) is out of service

TCC/SOC notification that actual or predicted Megawatt reserves are less than 500 MW

TCC/SOC notification that North American Electric Reliability Corporation (NERC) Alert Level 2 or 3 has been declared

TCC/SOC notification of potential degraded grid voltage or frequency condition

OAC alarm on Lo 7KV bus voltage

OAC alarm on Lo 4KV bus voltage.

C. Operator Actions

✓ 1.	**Announce occurrence on page.**	
✓ 2.	**Ensure dispatcher is aware of problem.**	
✓ 3.	**Notify Unit 2 to evaluate implementing AP/2/A/5500/05 (Generator Voltage and Electric Grid Disturbances).**	
✓ 4.	**Check Unit 1 Generator - TIED TO GRID.**	__ **GO TO Step 20.**
__ 5.	**IF AT ANY TIME reactor power is greater than 100%, THEN reduce turbine load to maintain reactor power less than 100%.**	
__ 6.	**Check Unit 1 Generator frequency - GREATER THAN 58.5 Hz.** →	✓ **IF Generator frequency does not immediately recover above 58.5 Hz, THEN GO TO Step 15 to separate from the grid.**

7. **Monitor Generator Capability Curve as follows:**

NOTE In the following step, if Generator voltage is fluctuating above and below 24 KV, then assume voltage is less than 24 KV.

__ a. Check Generator voltage - LESS THAN 24 KV.	a. Perform the following: __ 1) Monitor Generator Capability Curve **PER** Enclosure 1 (Generator Capability Curve - 24 KV). __ 2) **GO TO** Step 8.
__ b. Check OAC - IN SERVICE.	b. Perform the following: __ 1) Monitor Generator Capability Curve **PER** Enclosure 2 (Generator Capability Curve - 22.8 KV). __ 2) **GO TO** Step 8.
__ c. Monitor Generator Capability Curve **PER** OAC turn on code "GENCAP".	

__ 8. **Check Generator MVARs - WITHIN LIMITS OF GENERATOR CAPABILITY CURVE.**

__ **GO TO Step 11.**

__ 9. **IF AT ANY TIME capability curve exceeded, THEN perform Steps 11 and 12.**

__ 10. **GO TO Step 13.**

11. **Adjust MVARs to within the capability curve by performing one of the following:**

__ Depress "LOWER" on the "VOLTAGE ADJUST" to reduce lagging MVARs

OR

__ Depress "RAISE" on the "VOLTAGE ADJUST" to reduce leading MVARs.

__ 12. **Check Generator MVARs - WITHIN LIMITS OF GENERATOR CAPABILITY CURVE.**

IF actions in Step 11 do not restore MVARs, THEN perform the following:

a. **IF** voltage regulator in "AUTO", **THEN** perform the following:

__ 1) Place voltage regulator in "MAN".

__ 2) Adjust MVARs to within the capability curve.

b. **IF** unable to maintain MVARs within curve, **THEN** remove generator from service as follows:

1) **IF** greater than P-8, **THEN** perform the following:

__ a) Trip reactor.

__ b) **GO TO** EP/1/A/5000/E-0 (Reactor Trip or Safety Injection).

2) **IF** less than P-8, **THEN** perform the following:

__ a) Trip turbine.

__ b) **GO TO** AP/1/A/5500/02 (Turbine Generator Trip).

13. **Monitor Generator frequency as follows:**

__ a. Check generator frequency - AT 60 Hz.	__ a. **GO TO** Step 13.d.
__ b. **IF AT ANY TIME** generator frequency is abnormal **OR** TCC/SOC reports abnormal grid frequency condition, **THEN GO TO** Step 13.d.	
__ c. **GO TO** Step 16.	
__ d. Place OAC point M1A0966 (U1 Generator Frequency) on trend with a range of 58.0 to 60.0 Hz.	

CAUTION **If Generator frequency goes below 58.5 Hz, the unit must be separated from the grid within 10 minutes or a Generator lockout will occur.**

__ e. **IF AT ANY TIME** Generator frequency goes below 58.5 Hz (LO LO alarm setpoint on OAC) **AND** does not immediately recover above 58.5 Hz, **THEN GO TO** Step 15 to separate from the grid.

__ 14. **GO TO Step 16.**

15. **Separate from the grid as follows:**

__ a. Notify SOC that Unit 1 is separating from the grid.	
__ b. Ensure control rods in auto.	
__ c. Check "TURB IMP PRESS CH 2" - GREATER THAN 340 PSIG.	__ c. **GO TO** Step 15.k.

15. (Continued)

__ d. Check Turbine automatic control - AVAILABLE.

d. Perform the following:

__ 1) Ensure Turbine in "MANUAL" control.

__ 2) Immediately lower Turbine load to less than 300 MW using "GV LOWER".

__ 3) **WHEN** PCBs are opened to separate from the Grid in step 15.l, **THEN** use "GV LOWER" and "GV RAISE" to maintain 1800 RPM.

__ 4) **GO TO** Step 15.j.

__ e. Ensure Turbine control in "OPERATOR AUTO".

__ f. Place "MW LOOP" in service.

__ g. Enter target load of 300 MW.

__ h. Enter load rate of 300 MW/MIN.

__ i. Depress "GO".

j. Do not continue until the following conditions are met:

__ "TURB IMP PRESS CH 2" - LESS THAN 340 PSIG

__ P/R meters - LESS THAN 60%.

__ k. Notify Unit 2 Operator that Unit 1 is separating from the Grid.

l. Open the following Switchyard PCBs:

__ 1) Open PCB-8.

__ 2) Open PCB-9.

__ 3) Open PCB-11.

__ 4) Open PCB-12.

__ m. **GO TO** AP/1/A/5500/03 (Load Rejection).

SIM JPM F

Facility: McGuire Task No.:

Task Title: Restore Repaired Power Range Channel to Service JPM No.: 2010 Systems - Control Room JPM F

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

Examinee: Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

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

Initial Conditions:

- With Unit 1 at 100% power, Power Range Channel N43 failed low.
- The Control Room crew removed Power Range Channel N43 from service in accordance with AP16, "Malfunction of Nuclear Instrumentation," Case III.
- The instrument has been out of service for 16 hours, and IAE has inserted the required bistable trip signals.
- IAE has indicated that the channel has been repaired and can now be restored to service.

Task Standard: Complete a restoration of a previously failed Power Range Channel. All critical tasks evaluated as satisfactory.

Required Materials: N43 Control Power Fuses
Foot Stool available near Excore NIS Cabinets

General References: AP/1/A/5500/16 (Malfunction of Nuclear Instrumentation)

Handouts: AP/1/A/5500/16 (Malfunction of Nuclear Instrumentation) Case III, marked up for place-keeping through Step 20.

Initiating Cue:	The CRS has directed you to restore Power Range Channel N43 to service in accordance with Step 21 of AP16 (Malfunction of Nuclear Instrumentation) Case III, "Power Range Malfunction."
Time Critical Task:	NO
Validation Time:	10 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-39, 100% Power
2. Place in RUN and allow time to stabilize
3. Insert Malfunction ENB13F (0%), Power Range Channel Failure, N43
4. Perform the actions of AP/1/A/5500/16 up through step 20.
5. Run CAEPZZPR43BS
6. Remove Malfunction.
7. Freeze the Simulator.

OR

1. Reset to IC-246 (April, 2010).
2. Place Simulator in Run and acknowledge alarms/Reset SLIMS.

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout AP/1/A/5500/16, with Case III marked up for place-keeping through step 20.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 21) WHEN malfunctioning P/R channel repaired, THEN perform the following: (Step 21.a) Ensure instrument power fuses in "POWER RANGE B" drawer installed.	The operator checks fuses installed in Power Range B Drawer.		
*2	(Step 21.b) Install control power fuses in "POWER RANGE A" drawer.	The operator inserts fuses into Power Range A Drawer. The operator observes the Drawer lights come back on.		
*3	(Step 21.c) Select "RESET" on the "RATE MODE SWITCH".	The operator selects RESET on the Rate Mode Switch and allows spring-return to NORMAL. The operator observes the Positive Rate Trip light extinguishes.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	(Step 21.d) Check reactor power – GREATER THAN 25%.	The operator observes other Power Range Channels and determines that the plant is at 100% power.		
5	(Step 21.e) Check the following bistable - LIT: "P/R HI FLUX LO STPT" (1SI-2).	The operator observes that the P/R HI FLUX LO STPT Bistable light is LIT (1SI2-C12).		
6	(Step 21.f) Check the following bistables - DARK: "P/R HI FLUX HI STPT" (1SI-2) "P/R HI FLUX RATE" (1SI-3).	The operator observes that the P/R HI FLUX HI STPT Bistable light is DARK (1SI2-C13). The operator observes that the P/R HI FLUX HI RATE Bistable light is DARK (1SI3-C1).		
*7	(Step 21.g) Place "COMPARATOR CHANNEL DEFEAT" switch to "NORMAL".	At Comparator and Rate Drawer, The operator places the COMPARATOR CHANNEL DEFEAT switch to NORMAL. The operator observes the Comparator Defeat light extinguishes.		
*8	(Step 21.h) Place "POWER MISMATCH BYPASS" switch to "OPERATE".	At Detector Current Comparator Drawer, The operator places the POWER MISMATCH BYPASS switch to OPERATE.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*9	(Step 21.i) Place "UPPER SECTION" switch to "NORMAL".	At Detector Current Comparator Drawer, The operator places the UPPER SECTION switch to NORMAL. The operator observes the Channel Defeat light extinguishes.		
*10	(Step 21.j) Place "LOWER SECTION" switch to "NORMAL".	At Detector Current Comparator Drawer, The operator places the LOWER SECTION switch to NORMAL. The operator observes the Channel Defeat light extinguishes.		
*11	(Step 21.k) Place "ROD STOP BYPASS" switch to "OPERATE".	At Detector Current Comparator Drawer, The operator places the ROD STOP BYPASS switch to OPERATE.		
12	(Step 21.l) IF IAE tripped bistables PER Step 18, THEN perform the following: (Step 21.l.1) Instruct IAE to place the following bistables for failed channel back in service: • OPDT • OTDT	The operator contacts IAE. **Cue:** **IAE will return Bistables to service.**		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems - Control Room JPM F

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- With Unit 1 at 100% power, Power Range Channel N43 failed low.
- The Control Room crew removed Power Range Channel N43 from service in accordance with AP16, "Malfunction of Nuclear Instrumentation," Case III.
- The instrument has been out of service for 16 hours, and IAE has inserted the required bistable trip signals.
- IAE has indicated that the channel has been repaired and can now be restored to service.

INITIATING CUE:

The CRS has directed you to restore Power Range Channel N43 to service in accordance with Step 21 of AP16 (Malfunction of Nuclear Instrumentation) Case III, "Power Range Malfunction."

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

B. Symptoms

- Erratic or loss of P/R indication
- "P/R HI VOLTAGE FAILURE" alarm
- "P/R HI FLUX RATE ALERT" alarm
- "P/R HI FLUX LO STPT ALERT" alarm
- "P/R HI FLUX HI STPT ALERT" alarm
- "P/R CHANNEL DEVIATION" alarm
- "P/R UPPER DET HI FLUX DEV OR AUTO DEFEAT" alarm
- "P/R OVER POWER ROD STOP" alarm
- "P/R LOWER DET HI FLUX DEV OR AUTO DEFEAT" alarm
- Loss of "INSTRUMENT POWER ON" or "CONTROL POWER ON" lights.

C. Operator Actions

✓ 1. Place control rods in manual.

✓ 2. Check S/G levels - AT PROGRAMMED LEVEL.

__ IF auto does not restore S/G level(s) to program, THEN place affected S/G CF control valves in manual and return level to program.

✓ 3. Announce occurrence on paging system.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
✓ 4. **Check P/R channels - ONLY ONE CHANNEL FAILED.**	**Perform the following:** __ a. Initiate unit shutdown to Mode 3 within one hour, as required by Tech Spec 3.0.3. __ b. **REFER TO** RP/0/A/5700/010 (NRC Immediate Notification Requirements). c. Ensure the following interlocks are in their required state for existing plant conditions: __ • P-7 Lo Power Rx Trips Blocked __ • P-8 Hi Pwr Lo Flo Rx Trip Blocked __ • P-10 Nuclear at Power. __ d. **RETURN TO** procedure in effect.
✓ 5. **Secure any power increase in progress.**	
6. **Check the following interlocks - IN REQUIRED STATE FOR EXISTING PLANT CONDITIONS:** ✓ • P-7 Lo Power Rx Trips Blocked ✓ • P-8 Hi Pwr Lo Flo Rx Trip Blocked ✓ • P-10 Nuclear at Power.	__ **Notify IAE.**
7. **Perform the following actions at the "MISCELLANEOUS CONTROL AND INDICATION PANEL" drawer:** ✓ a. Place the appropriate "ROD STOP BYPASS" switch to the failed channel position. ✓ b. Place the "POWER MISMATCH BYPASS" switch to the failed channel position.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

8. **Perform the following actions at the "DETECTOR CURRENT COMPARATOR" drawer:**

   __ Notify IAE.

   ✓ a. Place the "UPPER SECTION" switch to the failed channel position.

   ✓ b. Check the "CHANNEL DEFEAT" light for the upper section - LIT.

   ✓ c. Place the "LOWER SECTION" switch to the failed channel position.

   ✓ d. Check the "CHANNEL DEFEAT" light for the lower section - LIT.

9. **Perform the following actions at the "COMPARATOR AND RATE" drawer:**

   __ Notify IAE.

   ✓ a. Place the "COMPARATOR CHANNEL DEFEAT" switch to the failed channel position.

   ✓ b. Check the "COMPARATOR DEFEAT" light - LIT.

NOTE Removing fuses from power range drawers may cause associated NIS annunciators to alarm.

10. **Trip bistables of failed channel as follows:**

    ✓ a. Remove Control Power fuses from "POWER RANGE A" drawer for failed channel.

    ✓ b. **IF** Power Range Cabinet shows evidence of damage (i.e. visual smoke or abnormal smell), **THEN** remove Instrument Power fuses from "POWER RANGE B" drawer.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

11. **Check the following status lights for the failed channel - LIT:**

- ✓ "NUC OVERPOWER ROD STOP CH I(II,III,IV) BYP" (1SI-19)
- ✓ "P/R HI FLUX LO STPT" (1SI-2)
- ✓ "P/R HI FLUX HI STPT" (1SI-2)
- ✓ "P/R HI FLUX RATE" (1SI-3).

__ **Notify IAE.**

12. **Check the following annunciator lights - LIT:**

- ✓ "P/R HI VOLTAGE FAILURE" (1AD-2, F-3)
- ✓ "P/R HI FLUX HI STPT ALERT" (1AD-2, A-3)
- ✓ "P/R HI FLUX RATE ALERT" (1AD-2, A-1).

__ **Notify IAE.**

13. **Check the following status lights on 1SI-18 - LIT:**

- ✓ "P/R LO SETPOINT TRAIN A TRIP BLOCKED"
- ✓ "P/R LO SETPOINT TRAIN B TRIP BLOCKED".

Perform the following:

__ a. Check "P/R HI FLUX LO STPT ALERT" alarm (1AD-2, A-2) - LIT.

__ b. **IF** alarm is dark, **THEN** notify IAE to investigate.

✓ 14. **Check all CF control valves - IN AUTO.**

__ **WHEN S/Gs at programmed level AND auto control desired, THEN place CF control valve(s) in auto.**

✓ 15. **Ensure operable P/R channel selected to record on NIS Recorder.**

✓ 16. **Adjust control rods to maintain T-Avg at T-Ref.**

__ **IF rods will not move in manual, THEN adjust turbine load to maintain T-Avg at T-Ref.**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

✓ 17. **WHEN T-Avg within 1°F of T-Ref, AND auto rod control desired, THEN return control rods to auto.**

18. **Instruct IAE to trip the following bistables associated with failed P/R channel within 72 hours of failure PER IP/1/A/3090/014 (Tripping Inoperable Protection Channels):**

✓ • OPDT

✓ • OTDT.

19. **IF AT ANY TIME failed P/R channel is repaired prior to IAE tripping bistables, THEN perform the following:**

N a. Inform IAE that bistables are no longer required to be tripped.

N b. **GO TO** Step 21.

20. **IF AT ANY TIME IAE completes Step 18, THEN check the following status lights for affected P/R - LIT:**

__ **Notify IAE.**

- For P/R N-41:

__ • "NC LOOP A OPDT RX TRIP" (1SI-7)
__ • "NC LOOP A OTDT RX TRIP" (1SI-7).

- For P/R N-42:

__ • "NC LOOP B OPDT RX TRIP" (1SI-7)
__ • "NC LOOP B OTDT RX TRIP" (1SI-7).

- For P/R N-43:

✓ • "NC LOOP C OPDT RX TRIP" (1SI-7)
✓ • "NC LOOP C OTDT RX TRIP" (1SI-7).

- For P/R N-44:

__ • "NC LOOP D OPDT RX TRIP" (1SI-7)
__ • "NC LOOP D OTDT RX TRIP" (1SI-7).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

21. **WHEN malfunctioning P/R channel repaired, THEN perform the following:**

__ a. Ensure instrument power fuses in "POWER RANGE B" drawer installed.

__ b. Install control power fuses in "POWER RANGE A" drawer.

__ c. Select "RESET" on the "RATE MODE SWITCH".

__ d. Check reactor power - GREATER THAN 25%.

d. Perform the following:

1) Check the following bistable - DARK:

__ • "P/R HI FLUX LO STPT" (1SI-2).

__ 2) **IF** bistable lit, **THEN** notify IAE.

__ 3) **GO TO** Step 21.f.

e. Check the following bistable - LIT:

__ • "P/R HI FLUX LO STPT" (1SI-2).

__ e. Notify IAE.

f. Check the following bistables - DARK:

__ • "P/R HI FLUX HI STPT" (1SI-2)

__ • "P/R HI FLUX RATE" (1SI-3).

__ f. Notify IAE.

__ g. Place "COMPARATOR CHANNEL DEFEAT" switch to "NORMAL".

__ h. Place "POWER MISMATCH BYPASS" switch to "OPERATE".

__ i. Place "UPPER SECTION" switch to "NORMAL".

__ j. Place "LOWER SECTION" switch to "NORMAL".

__ k. Place "ROD STOP BYPASS" switch to "OPERATE".

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

21. (Continued)

l. **IF** IAE tripped bistables **PER** Step 18, **THEN** perform the following:

1) Instruct IAE to place the following bistables for failed channel back in service:

__ • OPDT

__ • OTDT.

2) **WHEN** IAE has placed bistables back in service, **THEN** check the following status lights for failed P/R - DARK:

__ 2) Notify IAE.

• For P/R N-41:

__ • "NC LOOP A OPDT RX TRIP" (1SI-7)

__ • "NC LOOP A OTDT RX TRIP" (1SI-7).

• For P/R N-42:

__ • "NC LOOP B OPDT RX TRIP" (1SI-7)

__ • "NC LOOP B OTDT RX TRIP" (1SI-7).

• For P/R N-43:

__ • "NC LOOP C OPDT RX TRIP" (1SI-7)

__ • "NC LOOP C OTDT RX TRIP" (1SI-7).

• For P/R N-44:

__ • "NC LOOP D OPDT RX TRIP" (1SI-7)

__ • "NC LOOP D OTDT RX TRIP" (1SI-7).

END

SIM JPM G

Facility:	McGuire	Task No.:	
Task Title:	Isolate the Circulating Water System During Turbine Building Flooding	JPM No.:	2010 Systems - Control Room JPM G
K/A Reference:	075 A2.02 2.5/2.7		

Examinee: Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

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

Initial Conditions:
- With Unit 1 at 100% power, massive RC System Flooding occurred in the Unit 1 Turbine Building.
- The crew has implemented AP/0/A/5500/44 (Plant Flooding) Enclosure 1 (Unit 1 Turbine Bldg Flooding), and an operator has just been dispatched to check the flood doors closed.
- The crew has just manually tripped the reactor.
- An operator has been dispatched to close the breaker for 1RC-21.
- The U-1 Turbine Building Rounds NEO (Bob) is standing by via radio.

Task Standard: The operator takes actions to isolate the Unit 1 RC System.

Required Materials: None

General References:
- AP/0/A/5500/44 (Plant Flooding)
- PT/0/A/4600/113 (Operator Time Critical Task Verification), Enclosure 13.16 (Isolating Internal Plant Flooding)
- EP/1/A/5000/E-0 (Reactor Trip or Safety Injection)
- EP/1/A/5000/ES-0.1 (Reactor Trip Response)

Handouts: Enclosure 1 (Unit 1 Turbine Bldg Flooding) of AP/0/A/5500/44 (Plant Flooding) marked up for place-keeping through Step 6.c RNO c.2.

Initiating Cue:	The CRS has directed you to isolate the RC System by continuing with Enclosure 1 (Unit 1 Turbine Bldg Flooding) of AP/0/A/5500/44 (Plant Flooding), step 6.d, and completing all Step 6 substeps, while the crew continues with EP/1/A/5000/E-0 (Reactor Trip and/or Safety Injection). **This is a Time Critical JPM**
Time Critical Task:	YES – 40 minutes.
Validation Time:	15 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-39, 100% Power
2. Place in RUN and allow time to stabilize
3. Overide MCB Annunciator 1AD8/C4, TURB ROOM SUMP UNIT 1 HI-HI LEVEL to ON.
4. Manually trip reactor.
5. Complete EP/1/A/5000/E-0 through Step 6, and EP/1/A/5000/ES-0.1 through Step 16.
6. Acknowledge all alarms.
7. Freeze the Simulator.

OR

1. Reset to Temp IC-247 (April, 2010).
2. Place Simulator in Run and acknowledge alarms/Reset SLIMS.

NOTE: Simulator Instructor will need to operate Trigger #1 at JPM Step 6.

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 1 (Unit 1 Turbine Bldg Flooding) of AP/0/A/5500/44 (Plant Flooding) marked up for place-keeping through Step 6.c RNO c.2.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	(Step 6.d) Open Main condenser "VACUUM BREAKER".	The operator depresses the Vacuum Breaker OPEN pushbutton and observes the Red status light LIT, and Green status light OFF.		
*2	(Step 6.e) Stop all Unit 1 RC pumps: • 1A RC pump	The operator depresses the 1A RC Pump STOP pushbutton and observes the Green status light LIT, and Red status light OFF (Amps indicate 0).		
	• 1B RC pump	The operator depresses the 1B RC Pump STOP pushbutton and observes the Green status light LIT, and Red status light OFF (Amps indicate 0).		
	• 1C RC pump	The operator depresses the 1C RC Pump STOP pushbutton and observes the Green status light LIT, and Red status light OFF (Amps indicate 0).		
	• 1D RC pump	The operator depresses the 1D RC Pump STOP pushbutton and observes the Green status light LIT, and Red status light OFF (Amps indicate 0).		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(Step 6.f) Press close pushbutton on the following valves:	**Examiner Note:** **The operator may NOT wait for these valves to complete stroking, prior to proceeding (Bulleted Substeps), The procedure checks their position later.**		
	• 1RC-9 (1A1 Main Condenser Waterbox Inlet Isol)	The operator depresses the 1RC-9 CLOSE pushbutton and observes the Green status light LIT, and Red status light OFF.		
	• 1RC-10 (1A2 Main Condenser Waterbox Inlet Isol)	The operator depresses the 1RC-10 CLOSE pushbutton and observes the Green status light LIT, and Red status light OFF.		
	• 1RC-11 (1B1 Main Condenser Waterbox Inlet Isol)	The operator depresses the 1RC-11 CLOSE pushbutton and observes the Green status light LIT, and Red status light OFF.		
	• 1RC-12 (1B2 Main Condenser Waterbox Inlet Isol)	The operator depresses the 1RC-12 CLOSE pushbutton and observes the Green status light LIT, and Red status light OFF.		
	• 1RC-13 (1C1 Main Condenser Waterbox Inlet Isol)	The operator depresses the 1RC-13 CLOSE pushbutton and observes the Green status light LIT, and Red status light OFF.		

Continued NEXT PAGE

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3 (CONT'D)	• 1RC-14 (1C2 Main Condenser Waterbox Inlet Isol).	The operator depresses the 1RC-14 CLOSE pushbutton and observes the Green status light LIT, and Red status light OFF.		
4	(Note prior to Step 6.g) RC crossover supply and discharge valve indications are on Unit 1 OAC (RC graphic).	The operator reads the Note and proceeds.		
5	(Step 6.g) Check 1RC-22 (U1 RC Crossover To U2 RC Disch Isol) - OPEN.	The operator observes the OAC (RC Graphic) 1RC-22 is RED.		
		Examiner Cue: **Alert Booth Operator to operate Trigger #1.** **Simulator Instructor:** **Operate Trigger #1.** **Afterwards, Call as NEO, and report that the breaker for 1RC-21 has been closed.**		
6	(Step 6.h) Check 1RC-7 (U1 RC Crossover To U2 RC Supply Isol) - OPEN.	The operator observes the 1RC-7 Red status light LIT, and Green status light OFF.		
*7	(Step 6.i) Press close pushbutton for 1RC-5 (U1 RC Crossover Supply Isol).	The operator depresses the 1RC-5 CLOSE pushbutton and observes the Green status light LIT, and Red status light OFF.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*8	(Step 6.j) WHEN breaker for 1RC-21 is closed, THEN press the close pushbutton for 1RC-21 (U1 RC Crossover Disch Isol)	The operator observes the 1RC-21 Red status light LIT, and Green status light OFF. The operator depresses the 1RC-21 CLOSE pushbutton and observes the Green status light LIT, and Red status light OFF.		
*9	(Step 6.k) Press close pushbutton on the following Unit 1 RC discharge gates: • 1RC-79 (1A Main Condenser Discharge Gate) • 1RC-80 (1B Main Condenser Discharge Gate) • 1RC-81 (1C Main Condenser Discharge Gate)	The operator depresses the 1RC-79 CLOSE pushbutton. The operator depresses the 1RC-80 CLOSE pushbutton. The operator depresses the 1RC-81 CLOSE pushbutton.		
10	(Step 6.l) Record time.	The operator records the time in the space provided.		
11	(Note prior to Step 6.m) Waterbox isolation valves take 1-2 minutes to close.	The operator reads the Note and proceeds.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*12	(Step 6.m) Close waterbox outlet valves as follows: • WHEN 1RC-9 is closed, THEN close 1RC-15 (1A1 Main Condenser Waterbox Outlet Isol). • WHEN 1RC-10 is closed, THEN close 1RC-16 (1A2 Main Condenser Waterbox Outlet Isol). • WHEN 1RC-11 is closed, THEN close 1RC-17 (1B1 Main Condenser Waterbox Outlet Isol). • WHEN 1RC-12 is closed, THEN close 1RC-18 (1B2 Main Condenser Waterbox Outlet Isol). • WHEN 1RC-13 is closed, THEN close 1RC-19 (1C1 Main Condenser Waterbox Outlet Isol). • WHEN 1RC-14 is closed, THEN close 1RC-20 (1C2 Main Condenser Waterbox Outlet Isol).	The operator, after observing the associated Waterbox Inlet Valve Green status light LIT, depresses the associated Waterbox Outlet Valve CLOSE pushbutton and observes the Green status light LIT, and Red status light OFF, for each valve.		
13	(Step 6.n) Check 1RC-5 (U1 RC Crossover Supply Isol) - CLOSED.	The operator observes the 1RC-5 Green status light LIT, and Red status light OFF.		
14	(Step 6.o) Check 1RC-21 (U1 RC Crossover Disch Isol) - CLOSED.	The operator observes the 1RC-21 Green status light LIT, and Red status light OFF.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
15	(Step 6.p) Place 1RL-18 (Unit 1 LT Coolers Control) in manual and close.	The operator places the 1RL-18 Controller in MANUAL, and adjusts so that 1RL-18 is CLOSED (Output = 0).		
16	(Step 6.q) Dispatch operator to perform the following: Close 1RL-13 (1A LT Cooler Inlet Isol) (Unit 1 turbine bldg, 760+10, 1GG-33 & 1F-33, north of MTOT room) Close 1RL-15 (1B LT Cooler Inlet Isol) (Unit 1 turbine bldg, 739+5 1G-33 & 1FF-33, bottom of stairway).	The operator contacts an NEO to take both actions. **Booth CUE:** **As NEO, acknowledge.**		
17	(Step 6.r) Check Unwatering pump - OUT OF SERVICE.	The operator contacts the NEO (or WCC) in the Unit 1 Turbine Building. **Booth CUE:** **As NEO (or WCCS) in U1 TB, the Unwatering Pump is NOT in service.**		
18	(Note prior to Step 6.s) RC pump discharge valve indications are on RCPMPS graphic. These valves should automatically close when their respective RC pump is stopped.	The operator reads the Note and proceeds.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
19	(Step 6.s) Check the following RC Inlet valves - CLOSED:			
	• 1RC-1 (1A RC Pump Disch Isol)	The operator observes OAC Graphic (RC PMPS) showing 1RC-1 as GREEN.		
	• 1RC-2 (1B RC Pump Disch Isol)	The operator observes OAC Graphic (RC PMPS) showing 1RC-2 as GREEN.		
	• 1RC-3 (1C RC Pump Disch Isol)	The operator observes OAC Graphic (RC PMPS) showing 1RC-3 as GREEN.		
	• 1RC-4 (1D RC Pump Disch Isol).	The operator observes OAC Graphic (RC PMPS) showing 1RC-4 as GREEN.		
20	(Note prior to Step 6.t) Discharge gates can take up to 11 minutes to close from time recorded in Step 6.l.	The operator reads the Note and proceeds.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
21	(Step 6.t) Check the following RC discharge gates on Unit 1 - CLOSED: • 1RC-79 (1A Main Condenser Discharge Gate) • 1RC-80 (1B Main Condenser Discharge Gate) • 1RC-81 (1C Main Condenser Discharge Gate).	The operator observes the 1RC-79 Green and Red status light LIT. The operator observes the 1RC-80 Green and Red status light LIT. The operator observes the 1RC-81 Green and Red status light LIT. **Examiner NOTE:** **These Valves will most likely still be stroking close (≈13 minutes closure time).**		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems - Control Room JPM G

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

With Unit 1 at 100% power, massive RC System Flooding occurred in the Unit 1 Turbine Building.

The crew has implemented AP/0/A/5500/44 (Plant Flooding) Enclosure 1 (Unit 1 Turbine Bldg Flooding), and an operator has just been dispatched to check the flood doors closed.

The crew has just manually tripped the reactor.

An operator has been dispatched to close the breaker for 1RC-21.

The U-1 Turbine Building Rounds NEO (Bob) is standing by via radio.

INITIATING CUE:

The CRS has directed you to isolate the RC System by continuing with Enclosure 1 (Unit 1 Turbine Bldg Flooding) of AP/0/A/5500/44 (Plant Flooding), step 6.d, and completing all Step 6 substeps, while the crew continues with EP/1/A/5000/E-0 (Reactor Trip and/or Safety Injection).

This is a Time Critical JPM

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

✓ 1. **Announce occurrence over page.**

__ 2. **IF AT ANY TIME flooding has been reduced to a manageable leak, THEN GO TO Step 10.**

✓ 3. **Dispatch operator to locally monitor status of flood PER Enclosure 8 (Unit 1 Turbine Bldg Flood Monitoring).**

✓ 4. **Select source of flooding and GO TO indicated step or enclosure:**

SOURCE	Step or Enclosure
Massive Flooding on a single condenser waterbox section	Step 5
Massive RC system flooding • More than one waterbox section • RC piping	Step 6
RC to Feedwater pump Condensers	Step 7
RC to Condensate Coolers	Step 8
CA Piping rupture	Step 9
RL piping to MTOT oil cooler	Enclosure 5 (Isolation of RC Crossover Header) Step 6
RC Crossover piping or components • Shared • RC to RN Supply line • RL system • RC to KR Heat Exchangers	Enclosure 5 (Isolation of RC Crossover Header)
RF Piping	Enclosure 6 (Flooding from Fire Protection Piping)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

5. **To isolate a single waterbox section, perform the following:**

__ a. Dispatch operator to check flood doors closed **PER** Enclosure 10 (Flood Doors).

NOTE Waterbox Isolation valves take 1-2 minutes to close.

b. Close isolation valves on affected waterbox:

CAUTION **Isolating 1A1 waterbox could affect hotwell level indication.**

1) For 1A1 waterbox:

__ a) Close 1RC-9 (1A1 Main Condenser Waterbox Inlet Isol).

__ b) **WHEN** inlet valve closed, **THEN** close 1RC-15 (1A1 Main Condenser Waterbox Outlet Isol).

__ 1) **IF** either waterbox isolation valve fails to close, **THEN GO TO** Step 6.

2) For 1A2 waterbox:

__ a) Close 1RC-10 (1A2 Main Condenser Waterbox Inlet Isol).

__ b) **WHEN** inlet valve closed, **THEN** close 1RC-16 (1A2 Main Condenser Waterbox Outlet Isol).

__ 2) **IF** either waterbox isolation valve fails to close, **THEN GO TO** Step 6.

3) For 1B1 waterbox:

__ a) Close 1RC-11 (1B1 Main Condenser Waterbox Inlet Isol).

__ b) **WHEN** inlet valve closed, **THEN** close 1RC-17 (1B1 Main Condenser Waterbox Outlet Isol).

__ 3) **IF** either waterbox isolation valve fails to close, **THEN GO TO** Step 6.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

5. (Continued)

4) For 1B2 waterbox:

__ a) Close 1RC-12 (1B2 Main Condenser Waterbox Inlet Isol).

__ b) **WHEN** inlet valve closed, **THEN** close 1RC-18 (1B2 Main Condenser Waterbox Outlet Isol).

__ 4) **IF** either waterbox isolation valve fails to close, **THEN GO TO** Step 6.

5) For 1C1 waterbox:

__ a) Close 1RC-13 (1C1 Main Condenser Waterbox Inlet Isol).

__ b) **WHEN** inlet valve closed, **THEN** close 1RC-19 (1C1 Main Condenser Waterbox Outlet Isol).

__ 5) **IF** either waterbox isolation valve fails to close, **THEN GO TO** Step 6.

6) For 1C2 waterbox:

__ a) Close 1RC-14 (1C2 Main Condenser Waterbox Inlet Isol).

__ b) **WHEN** inlet valve closed, **THEN** close 1RC-20 (1C2 Main Condenser Waterbox Outlet Isol).

__ 6) **IF** either waterbox isolation valve fails to close, **THEN GO TO** Step 6.

__ c. Reduce turbine load as necessary to maintain T-Avg at T-Ref.

__ d. Check flooding - REDUCED TO A MANAGEABLE LEAK.

d. Perform the following:

__ 1) **IF** flood still exists due to failure of individual water box isolation valve, **THEN GO TO** Step 6.

__ 2) Reevaluate source of flooding and **RETURN TO** Step 4.

__ e. **GO TO** Step 10.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6. **To isolate for massive RC system flooding in Unit 1 Turbine Building, perform the following:**

✓ a. Check Enclosure 10 (Flood Doors) - HAS BEEN IMPLEMENTED.

__ a. Dispatch operator to check flood doors closed **PER** Enclosure 10 (Flood Doors).

__ b. Dispatch operator to remove white tag and close 1MXA - R8C (RC Crossover Disch Isol Motor (1RC-21)) (Unit 1 TB basement, at 1B2 Feedwater Heater).

✓ c. Check Unit 1 reactor - TRIPPED.

c. Perform the following:

__ 1) Trip Unit 1 reactor.

__ 2) Have another operator continue with this AP.

__ 3) **GO TO** EP/1/A/5000/E-0 (Reactor Trip or Safety Injection).

__ d. Open Main condenser "VACUUM BREAKER".

e. Stop all Unit 1 RC pumps:

__ • 1A RC pump

__ • 1B RC pump

__ • 1C RC pump

__ • 1D RC pump.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6. (Continued)

f. Press close pushbutton on the following valves:

__ • 1RC-9 (1A1 Main Condenser Waterbox Inlet Isol)

__ • 1RC-10 (1A2 Main Condenser Waterbox Inlet Isol)

__ • 1RC-11 (1B1 Main Condenser Waterbox Inlet Isol)

__ • 1RC-12 (1B2 Main Condenser Waterbox Inlet Isol)

__ • 1RC-13 (1C1 Main Condenser Waterbox Inlet Isol)

__ • 1RC-14 (1C2 Main Condenser Waterbox Inlet Isol).

NOTE RC crossover supply and discharge valve indications are on Unit 1 OAC (RC graphic).

__ g. Check 1RC-22 (U1 RC Crossover To U2 RC Disch Isol) - OPEN.

__ g. **GO TO** Step 4 of Enclosure 5 (Isolation of RC Crossover Header) to isolate entire RC Crossover Header.

__ h. Check 1RC-7 (U1 RC Crossover To U2 RC Supply Isol) - OPEN.

h. Perform the following:

__ 1) Open 1RC-7.

__ 2) **IF** 1RC-7 will not open, **THEN GO TO** Step 4 of Enclosure 5 (Isolation of RC Crossover Header) to isolate entire RC Crossover Header.

__ i. Press close pushbutton for 1RC-5 (U1 RC Crossover Supply Isol).

__ j. **WHEN** breaker for 1RC-21 is closed, **THEN** press close pushbutton for 1RC-21 (U1 RC Crossover Disch Isol).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6. (Continued)

k. Press close pushbutton on the following Unit 1 RC discharge gates:

__ • 1RC-79 (1A Main Condenser Discharge Gate)

__ • 1RC-80 (1B Main Condenser Discharge Gate)

__ • 1RC-81 (1C Main Condenser Discharge Gate).

__ l. Record time _____.

NOTE Waterbox isolation valves take 1-2 minutes to close.

m. Close waterbox outlet valves as follows:

__ • **WHEN** 1RC-9 is closed, **THEN** close 1RC-15 (1A1 Main Condenser Waterbox Outlet Isol).

__ • **WHEN** 1RC-10 is closed, **THEN** close 1RC-16 (1A2 Main Condenser Waterbox Outlet Isol).

__ • **WHEN** 1RC-11 is closed, **THEN** close 1RC-17 (1B1 Main Condenser Waterbox Outlet Isol).

__ • **WHEN** 1RC-12 is closed, **THEN** close 1RC-18 (1B2 Main Condenser Waterbox Outlet Isol).

__ • **WHEN** 1RC-13 is closed, **THEN** close 1RC-19 (1C1 Main Condenser Waterbox Outlet Isol).

__ • **WHEN** 1RC-14 is closed, **THEN** close 1RC-20 (1C2 Main Condenser Waterbox Outlet Isol).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6. (Continued)

__ n. Check 1RC-5 (U1 RC Crossover Supply Isol) - CLOSED.

__ n. Dispatch operator to close 1RC-5 (U1 RC Crossover Supply Isol) (Unit 1 turbine bldg, 737, 1C-25 & 1C-26, west of 1C2 waterbox inlet in pit).

__ o. Check 1RC-21 (U1 RC Crossover Disch Isol) - CLOSED.

o. Perform the following:

__ 1) Contact security to provide access to Alarm Door 3230.

__ 2) Dispatch operator to unlock and close 1RC-21 (U1 RC Crossover Disch Isol) (Unit 1 turbine bldg, 739'1J-31, bunker between 1A2 and 1C2 feedwater heaters).

__ p. Place 1RL-18 (Unit 1 LT Coolers Control) in manual and close.

q. Dispatch operator to perform the following:

__ • Close 1RL-13 (1A LT Cooler Inlet Isol) (Unit 1 turbine bldg, 760+10, 1GG-33 & 1F-33, north of MTOT room)

__ • Close 1RL-15 (1B LT Cooler Inlet Isol) (Unit 1 turbine bldg, 739+5 1G-33 & 1FF-33, bottom of stairway).

__ r. Check Unwatering pump - OUT OF SERVICE.

__ r. Contact station management to evaluate securing Unwatering pump.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6. (Continued)

NOTE RC pump discharge valve indications are on RCPMPS graphic. These valves should automatically close when their respective RC pump is stopped.

s. Check the following RC Inlet valves - CLOSED:

- 1RC-1 (1A RC Pump Disch Isol)
- 1RC-2 (1B RC Pump Disch Isol)
- 1RC-3 (1C RC Pump Disch Isol)
- 1RC-4 (1D RC Pump Disch Isol).

s. Dispatch operator to close affected valve(s).

NOTE Discharge gates can take up to 11 minutes to close from time recorded in Step 6.l.

t. Check the following RC discharge gates on Unit 1 - CLOSED:

- 1RC-79 (1A Main Condenser Discharge Gate)
- 1RC-80 (1B Main Condenser Discharge Gate)
- 1RC-81 (1C Main Condenser Discharge Gate).

t. Perform the following:

1) Do not continue until discharge gates have had a chance to fully close.

2) **IF** any discharge gate will not close, **THEN** perform the following:

- Contact Security (2688) and have them meet operator at protected area gate 27 (intake structure) and escort them through the Zone and out gate 31 (discharge structure).
- Dispatch operator to meet security at protected area gate 27 (intake structure) and close Unit 1 RC Discharge Gates.

u. Check flooding - REDUCED TO A MANAGEABLE LEAK.

u. Reevaluate source of flooding and **RETURN TO** Step 4.

v. **GO TO** Step 10.

SIM JPM H

Facility: McGuire Task No.:

Task Title: Remove Pressurizer Heaters from Service JPM No.: 2010 Systems - Control Room JPM H

K/A Reference: 010, A4.02, 3.6/3.4

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

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

Initial Conditions: Unit 1 has just been raised to 100% per OP/1/A/6100/003 (Controlling Procedure for Unit Operation).
Chemistry has confirmed that the Boron Concentration difference between the Pzr and the NC System is 4 ppm.

Task Standard: The operator will remove the A, B and D Pzr Heater Groups from service in accordance with Step 3.4.4 of Enclosure 4.6, and then after responding to the failure, manually control pressure using at least one other heater groups. The operator will place at least one Pzr Heater Group in service in accordance with Step 3.3.1 (or equivalent) of Enclosure 4.6, before MCB Annunciator 1AD-6, C6 alarms.

Required Materials: None

General References: OP/1/A/6100/003 (Controlling Procedure for Unit Operation)
OP/1/A/6100/010G (Annunciator Response for Panel 1AD-6)
SOMP 04-02 (Procedure Use and Adherence)

Handouts: Enclosure 4.6 (Operation of Pzr Heaters) of OP/1/A/6100/003 (Controlling Procedure for Unit Operation)

Initiating Cue:	The CRS has directed you to remove Pzr Heater Groups A, B and D from service per Enclosure 4.6 (Operation of Pzr Heaters) of OP/1/A/6100/003, and ensure that NC System pressure is being controlled normally at 2235 psig. All outstanding R&Rs that may impact performance of Enclosure 4.6 have been evaluated.
Time Critical Task:	NO
Validation Time:	25 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-39 (100%)

2. Ensure Simulator reflects having been completed through Step 3.22.7.4 of OP/1/A/6100/003, Enclosure 4.1 (Power Increase).

3. Ensure that Pzr Heaters groups A, B, and D are energized.

4. Insert OVR-NC096D = ON; and ANN-AD06-D06 = ON, on Trigger #1.

5. Acknowledge Alarms and Freeze Simulator

OR

1. Reset Simulator to Temporary Snap IC-248 (April, 2010).
2. Momentarily place Simulator in Run to acknowledge alarms.
3. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: **During the performance of this JPM, the simulator operator will need to Operate Trigger # 1 at Step 20 of the JPM.**

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM, and Handout Enclosure 4.6 (Operation of Pzr Heaters) of OP/1/A/6100/003.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Enclosure 4.6, Step 3.1) Evaluate all outstanding R&Rs that may impact performance of this procedure.	The operator recognizes that this step has already been performed (Initial Conditions), and proceeds.		
2	(Note prior to Step 3.2) During steady state conditions, Pzr Htr Groups are normally OFF and in AUTO.	The operator reads the Note and proceeds.		
3	(Step 3.2) Perform the following sections as applicable: • Section 3.3, Placing A, B, D Pzr Heater Groups in Service. • Section 3.4, Removing A, B, D Pzr Heater Groups form Service. • Section 3.5, Placing C Pzr Heater Group in Service. • Section 3.6, Removing C Pzr Heater Group from Service.	The operator recognizes that Section 3.4 is the applicable section and proceeds to Section 3.4.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	(Step 3.4) Removing A, B, D Pzr Heater Groups From Service (Caution prior to Step 3.4.1) Pzr Htr Groups and Pzr Spray Controls should be operated with extreme caution to prevent NC System pressure transients. (Step 3.4.1) Ensure Boron Concentration difference between Pzr and NC System less than 50 ppm.	The operator reads the Caution and proceeds. The operator recognizes that this condition is already met (Initial Conditions), and proceeds.		
5	(Step 3.4.2) IF three Pzr Htr Groups in service AND desire to operate with two Pzr Htr Groups in service.....	The operator recognizes that this step is NOT applicable and proceeds.		
6	(Step 3.4.3) IF three Pzr Htr Groups in service AND desire to operate with one Pzr Htr Group in service.....	The operator recognizes that this step is NOT applicable and proceeds.		
*7	(Step 3.4.4) IF three Pzr Htr Groups in service AND desire to remove all Pzr Htr Groups from service, perform the following: (Step 3.4.4.1) Place one of the following in AUTO: A Pzr Htr Mode Select B Pzr Htr Mode Select D Pzr Htr Mode Select	The operator rotates either the A, B or D Pzr Htr Mode Select Switch counter - clockwise to AUTO.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
8	(Step 3.4.4.2) Check associated Pzr Htr Group in OFF. A Pzr Htr Group B Pzr Htr Group D Pzr Htr Group	The operator observes the Green status light LIT and the Red status light OFF for the heater group, whose Mode Select Switch was moved to AUTO in the previous step.		
9	(Step 3.4.4.3) Monitor Pzr pressure for 2 minutes.	The operator observes actual Pressurizer Pressure and Spray Valve position (Or equivalent) for 2 minutes and determines that Pzr Pressure has stabilized. **Examiner Cue:** **2 minutes has elapsed.**		
*10	(Step 3.4.4.4) Place second Pzr Htr Mode Select Switch in AUTO: A Pzr Htr Mode Select B Pzr Htr Mode Select D Pzr Htr Mode Select	The operator rotates either the A, B or D Pzr Htr Mode Select Switch counter-clockwise to AUTO.		
11	(Step 3.4.4.5) Check associated Pzr Htr Group in OFF. A Pzr Htr Group B Pzr Htr Group D Pzr Htr Group	The operator observes the Green status light LIT and the Red status light OFF for the heater group, whose Mode Select Switch was moved to AUTO in the previous step.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
12	(Step 3.4.4.6) Monitor Pzr pressure for 2 minutes.	The operator observes actual Pressurizer Pressure and Spray Valve position (Or equivalent) for 2 minutes and determines that Pzr Pressure has stabilized. **Examiner Cue:** **2 minutes has elapsed.**		
13	(Note prior to Step 3.4.4.7) Steps 3.4.4.7 – 3.4.4.10 C should be performed without delay.	The operator reads the Note and proceeds.		
*14	(Step 3.4.4.7) Place third Pzr Htr Mode Select Switch in AUTO: A Pzr Htr Mode Select B Pzr Htr Mode Select D Pzr Htr Mode Select	The operator rotates either the A, B or D Pzr Htr Mode Select Switch counter-clockwise to AUTO.		
15	(Step 3.4.4.8) Check associated Pzr Htr Group in OFF. A Pzr Htr Group B Pzr Htr Group D Pzr Htr Group	The operator observes the Green status light LIT and the Red status light OFF for the heater group, whose Mode Select Switch was moved to AUTO in the previous step.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
16	(Note prior to Step 3.4.4.9) Placing Pzr Press Master in manual makes automatic operation of 1NC-34A (Pzr PORV) unavailable and should be evaluated using Electronic Risk Assessment Tool. This assessment should be performed prior to placing the Pzr Press Master in manual.	The operator reads the Note and proceeds.		
17	(Step 3.4.4.9) IF time allows AND Unit 1 in Modes 1-4, evaluate unavailability of 1NC-34A (Pzr PORV) using Electronic Risk Assessment Tool.	The operator informs the CRS. **Examiner Cue:** **As the CRS, indicate that the ERAT has been used, and the Pzr Press Master may be placed in MAN.**		
*18	(Step 3.4.4.10) On the DCS Work Station, Pressurizer and PRT graphic, perform the following: (Step 3.4.4.10 A) Place PZR PRESS MASTER in manual.	The operator observes the NC-Pressurizer and PRT DCS Screen and observes Pressurizer pressure. The operator selects Pzr Pressure Master and selects "M" (Turns RED).		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*19	(Step 3.4.4.10 B) Adjust PZR PRESS MASTER output until the following occurs: C Pzr Htr Group begins cycling 1NC-27C (A Loop Pzr Spray Control) Closes 1NC-29C (B Loop Pzr Spray Control) Closes	Using the NC-Pressurizer and PRT DCS Screen, the operator adjusts until Pzr Press Master output (**DOWN**) until the error signal is < 15 psig. The operator observes C Pzr Heater Group Red Status light cycling ON and OFF, and determines that the C Pzr Htr Group is cycling. The operator observes the 1NC-27C SLIMs Limit Switch and determines that 1NC-27C is CLOSED. The operator observes the 1NC-29C SLIMs Limit Switch and determines that 1NC-29C is CLOSED.		
*20	(Step 3.4.4.10 C) Place PZR PRESS MASTER in auto.	Using the NC-Pressurizer and PRT DCS Screen, the operator selects Pzr Pressure Master and selects "A" (Turns GREEN).		

Simulator Instructor NOTE: Operate Trigger # 1 (PZR VARIABLE HEATERS FAIL) (Alternate Path)

It is expected that MCB Annunciator 1AD6/D6 (PZR HTR CONTROLLER TROUBLE) will alarm.

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*21	(Step 3.4.4.11) Monitor Pzr pressure for 2 minutes.	The operator observes actual Pressurizer Pressure and Spray valve Position (Or equivalent) and determines that Pzr Pressure is lowering. The operator observes MCB Annunciator 1AD6/D6 and addresses ARP.		
22	(OP/1/A/6100/010 G, Immediate Action 1) Remove Group C Heater Group from automatic control by opening supply breaker.	The operator observes the C Pzr Heater Group Green Status light is LIT, and determines that the Group C Heater supply breaker is OPEN.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*23	(OP/1/A/6100/010 G, Immediate Action 2) Manually control pressure using other heater groups.	The operator recognizes that no Pzr htrs are energized and proceeds to Enclosure 4.6, Step 3.3.1 to place one Pzr Htr Group in service. **Examiner Note:** **The operator may use one or more Pzr Heater Groups to maintain NC System Pressure within the normal band.** **The operator MUST place at least one Pzr Htr Group in service to complete the Critical nature of this task.** **The operator should realize the need to get one set of htrs on for pressure control and MAY start that one set of htrs based on ARP guidance to manually control pressure. If NOT, the required OP Steps are scripted.**		
		Examiner Note: **IF MCB Annunciator 1AD-6, C6, alarms before the operator energizes one set of Heaters, the Critical Step is Failed.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
24	(Enclosure 4.6, Step 3.3) Placing A, B, D Pzr Heater Groups in service. (Caution prior to Step 3.3.1) Pzr Htr Groups and Pzr Spray Controls should be operated with extreme caution to prevent NC System pressure transients. (Step 3.3.1) IF desired to operate with one Pzr Htr group in service, perform the following: (Step 3.3.1.1) Place of the following in MAN: A Pzr Htr Mode Select B Pzr Htr Mode Select D Pzr Htr Mode Select	The operator reads the Caution, and proceeds. The operator rotates either the A, B or D Pzr Htr Mode Select Switch clockwise to MAN.		
25	(Step 3.3.1.2) Place the associated Pzr Htr Group in ON: A Pzr Htr Group B Pzr Htr Group D Pzr Htr Group	The operator depresses the ON pushbutton for the heater group, whose Mode Select Switch was moved to MAN in the previous step, and observes the Red status light LIT and the Green status light OFF.		
26	(Step 3.3.1.3) Monitor Pzr pressure for 2 minutes.	The operator observes Pressurizer Pressure and Spray valve Position (Or equivalent) for 2 minutes and determines that Pzr Pressure has stabilized at 2235 ±15 psig.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems - Control Room JPM H

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

Unit 1 has just been raised to 100% per OP/1/A/6100/003 (Controlling Procedure for Unit Operation).

Chemistry has confirmed that the Boron Concentration difference between the Pzr and the NC System is 4 ppm.

INITIATING CUE:

The CRS has directed you to remove Pzr Heater Groups A, B and D from service per Enclosure 4.6 (Operation of Pzr Heaters) of OP/1/A/6100/003, and ensure that NC System pressure is being controlled normally at 2235 psig.

All outstanding R&Rs that may impact performance of Enclosure 4.6 have been evaluated.

1. Limits and Precautions

1.1 Maximum Boron concentration difference between Pzr and NC System is 50 ppm.

2. Initial Conditions

None

3. Procedure

☐ 3.1 Evaluate all outstanding R&Rs that may impact performance of this procedure.

NOTE: During steady state conditions, Pzr Htr Groups are normally "OFF" and in "AUTO".

3.2 Perform the following sections, as applicable:

- ☐ Section 3.3, Placing A, B, D Pzr Heater Groups In Service
- ☐ Section 3.4, Removing A, B, D Pzr Heater Groups From Service
- ☐ Section 3.5, Placing C Pzr Heater Group In Service
- ☐ Section 3.6, Removing C Pzr Heater From Service

3.3 Placing A, B, D Pzr Heater Groups In Service

CAUTION: Pzr Htr Groups and Pzr Spray Controls should be operated with extreme caution to prevent NC System pressure transients.

☐ 3.3.1 **IF** desired to operate with one Pzr Htr group in service, perform the following:

3.3.1.1 Place one of the following in "MAN":

- ☐ A Pzr Htr Mode Select
- ☐ B Pzr Htr Mode Select
- ☐ D Pzr Htr Mode Select

3.3.1.2 Place associated Pzr Htr Group in "ON":

- ☐ A Pzr Htr Group
- ☐ B Pzr Htr Group
- ☐ D Pzr Htr Group

☐ 3.3.1.3 Monitor Pzr pressure for 2 minutes.

☐ 3.3.2 **IF** desired to operate with two Pzr Htr Groups in service, perform the following:

3.3.2.1 Place one of the following in "MAN":

- ☐ A Pzr Htr Mode Select
- ☐ B Pzr Htr Mode Select
- ☐ D Pzr Htr Mode Select

3.3.2.2 Place associated Pzr Htr Group in "ON":

- ☐ A Pzr Htr Group
- ☐ B Pzr Htr Group
- ☐ D Pzr Htr Group

☐ 3.3.2.3 Monitor Pzr pressure for 2 minutes.

3.3.2.4 Ensure second Pzr Htr Mode Select in "MAN":

- ☐ A Pzr Htr Mode Select
- ☐ B Pzr Htr Mode Select
- ☐ D Pzr Htr Mode Select

3.3.2.5 Ensure associated Pzr Htr Group in "ON":

- ☐ A Pzr Htr Group
- ☐ B Pzr Htr Group
- ☐ D Pzr Htr Group

☐ 3.3.2.6 Monitor Pzr pressure for 2 minutes.

☐ 3.3.3 **IF** desired to operate with three Pzr Htr Groups in service, perform the following:

3.3.3.1 Place one of the following in "MAN":

☐ A Pzr Htr Mode Select
☐ B Pzr Htr Mode Select
☐ D Pzr Htr Mode Select

3.3.3.2 Place associated Pzr Htr Group in "ON":

☐ A Pzr Htr Group
☐ B Pzr Htr Group
☐ D Pzr Htr Group

☐ 3.3.3.3 Monitor Pzr pressure for 2 minutes.

3.3.3.4 Ensure second Pzr Htr Mode Select in "MAN":

☐ A Pzr Htr Mode Select
☐ B Pzr Htr Mode Select
☐ D Pzr Htr Mode Select

3.3.3.5 Ensure associated Pzr Htr Group in "ON":

☐ A Pzr Htr Group
☐ B Pzr Htr Group
☐ D Pzr Htr Group

☐ 3.3.3.6 Monitor Pzr pressure for 2 minutes.

3.3.3.7 Ensure third Pzr Htr Mode Select in "MAN":

☐ A Pzr Htr Mode Select
☐ B Pzr Htr Mode Select
☐ D Pzr Htr Mode Select

3.3.3.8 Ensure associated Pzr Htr Group in "ON":

☐ A Pzr Htr Group
☐ B Pzr Htr Group
☐ D Pzr Htr Group

☐ 3.3.3.9 Monitor Pzr pressure for 2 minutes.

3.4 Removing A, B, D Pzr Heater Groups From Service

CAUTION: Pzr Htr Groups and Pzr Spray Controls should be operated with extreme caution to prevent NC System pressure transients.

☐ 3.4.1 Ensure Boron Concentration difference between Pzr and NC System less than 50 ppm.

☐ 3.4.2 **IF** three Pzr Htr Groups in service **AND** desire to operate with two Pzr Htr Groups in service, perform the following:

3.4.2.1 Place one of the following in "AUTO":

- ☐ A Pzr Htr Mode Select
- ☐ B Pzr Htr Mode Select
- ☐ D Pzr Htr Mode Select

3.4.2.2 Check associated Pzr Htr Group in "OFF":

- ☐ A Pzr Htr Group
- ☐ B Pzr Htr Group
- ☐ D Pzr Htr Group

☐ 3.4.2.3 Monitor Pzr pressure for 2 minutes.

☐ 3.4.3 **IF** three Pzr Htr Groups in service **AND** desire to operate with one Pzr Htr Group in service, perform the following:

3.4.3.1 Place one of the following in "AUTO":

☐ A Pzr Htr Mode Select
☐ B Pzr Htr Mode Select
☐ D Pzr Htr Mode Select

3.4.3.2 Check associated Pzr Htr Group in "OFF":

☐ A Pzr Htr Group
☐ B Pzr Htr Group
☐ D Pzr Htr Group

☐ 3.4.3.3 Monitor Pzr pressure for 2 minutes.

3.4.3.4 Place second Pzr Htr Mode Select in "AUTO":

☐ A Pzr Htr Mode Select
☐ B Pzr Htr Mode Select
☐ D Pzr Htr Mode Select

3.4.3.5 Check associated Pzr Htr Group in "OFF":

☐ A Pzr Htr Group
☐ B Pzr Htr Group
☐ D Pzr Htr Group

☐ 3.4.3.6 Monitor Pzr pressure for 2 minutes.

☐ 3.4.4 **IF** three Pzr Htr Groups in service **AND** desire to remove all Pzr Htr Groups from service, perform the following:

3.4.4.1 Place one of the following in "AUTO":

☐ A Pzr Htr Mode Select
☐ B Pzr Htr Mode Select
☐ D Pzr Htr Mode Select

3.4.4.2 Check associated Pzr Htr Group in "OFF":

☐ A Pzr Htr Group
☐ B Pzr Htr Group
☐ D Pzr Htr Group

☐ 3.4.4.3 Monitor Pzr pressure for 2 minutes.

3.4.4.4 Place second Pzr Htr Mode Select in "AUTO":

☐ A Pzr Htr Mode Select
☐ B Pzr Htr Mode Select
☐ D Pzr Htr Mode Select

3.4.4.5 Check associated Pzr Htr Group in "OFF":

☐ A Pzr Htr Group
☐ B Pzr Htr Group
☐ D Pzr Htr Group

☐ 3.4.4.6 Monitor Pzr pressure for 2 minutes.

NOTE: Steps 3.4.4.7 - 3.4.4.10C should be performed without delay.

☐ 3.4.4.7 Place third Pzr Htr Mode Select in "AUTO":

☐ A Pzr Htr Mode Select
☐ B Pzr Htr Mode Select
☐ D Pzr Htr Mode Select

3.4.4.8 Check associated Pzr Htr Group in "OFF":

☐ A Pzr Htr Group
☐ B Pzr Htr Group
☐ D Pzr Htr Group

NOTE: Placing Pzr Press Master in manual makes automatic operation of 1NC-34A (Pzr PORV) unavailable and should be evaluated using Electronic Risk Assessment Tool. This assessment should be performed prior to placing Pzr Press Master in manual.

☐ 3.4.4.9 **IF** time allows **AND** Unit 1 in Modes 1-4, evaluate unavailablilty of 1NC-34A (Pzr PORV) using Electronic Risk Assessment Tool.

☐ 3.4.4.10 On the DCS Work Station, Pressurizer and PRT graphic, perform the following:

☐ A. Place "PZR PRESS MASTER" in manual.

☐ B. Adjust "PZR PRESS MASTER" output until the following occurs:

☐ C Pzr Htr Group begins cycling
☐ 1NC-27C (A Loop Pzr Spray Control) closes
☐ 1NC-29C (B Loop Pzr Spray Control) closes

☐ C. Place "PZR PRESS MASTER" in auto.

☐ 3.4.4.11 Monitor Pzr pressure for 2 minutes.

☐ 3.4.5 **IF** two Pzr Htr Groups in service **AND** desire to operate with one Pzr Htr Group in service, perform the following:

3.4.5.1 Place one of the following in "AUTO":

☐ A Pzr Htr Mode Select
☐ B Pzr Htr Mode Select
☐ D Pzr Htr Mode Select

3.4.5.2 Check associated Pzr Htr Group in "OFF":

☐ A Pzr Htr Group
☐ B Pzr Htr Group
☐ D Pzr Htr Group

☐ 3.4.5.3 Monitor Pzr pressure for 2 minutes.

☐ 3.4.6 **IF** two Pzr Htr Groups in service **AND** desire to remove all Pzr Htr Groups from service, perform the following:

3.4.6.1 Place one of the following in "AUTO":

- ☐ A Pzr Htr Mode Select
- ☐ B Pzr Htr Mode Select
- ☐ D Pzr Htr Mode Select

3.4.6.2 Check associated Pzr Htr Group in "OFF":

- ☐ A Pzr Htr Group
- ☐ B Pzr Htr Group
- ☐ D Pzr Htr Group

☐ 3.4.6.3 Monitor Pzr pressure for 2 minutes.

NOTE: Steps 3.4.6.4 - 3.4.6.7C should be performed without delay.

☐ 3.4.6.4 Place second Pzr Htr Mode Select in "AUTO":

- ☐ A Pzr Htr Mode Select
- ☐ B Pzr Htr Mode Select
- ☐ D Pzr Htr Mode Select

3.4.6.5 Check associated Pzr Htr Group in "OFF":

- ☐ A Pzr Htr Group
- ☐ B Pzr Htr Group
- ☐ D Pzr Htr Group

NOTE: Placing Pzr Press Master in manual makes automatic operation of 1NC-34A (Pzr PORV) unavailable and should be evaluated using Electronic Risk Assessment Tool. This assessment should be performed prior to placing Pzr Press Master in manual.

☐ 3.4.6.6 **IF** time allows **AND** Unit 1 in Modes 1-4, evaluate unavailablilty of 1NC-34A (Pzr PORV) using Electronic Risk Assessment Tool.

☐ 3.4.6.7 On the DCS Work Station, Pressurizer and PRT graphic, perform the following:

☐ A. Place "PZR PRESS MASTER" in manual.

☐ B. Adjust "PZR PRESS MASTER" output until the following occurs:

☐ C Pzr Htr Group begins cycling
☐ 1NC-27C (A Loop Pzr Spray Control) closes
☐ 1NC-29C (B Loop Pzr Spray Control) closes

☐ C. Place "PZR PRESS MASTER" in auto.

☐ 3.4.6.8 Monitor Pzr pressure for 2 minutes.

☐ 3.4.7 **IF** one Pzr Htr Group in service, perform the following:

NOTE: Steps 3.4.7.1 - 3.4.7.4C should be performed without delay.

☐ 3.4.7.1 Place operating Pzr Mode Select in "AUTO":

☐ A Pzr Htr Mode Select
☐ B Pzr Htr Mode Select
☐ D Pzr Htr Mode Select

3.4.7.2 Check associated Pzr Htr Group in "OFF":

☐ A Pzr Htr Group
☐ B Pzr Htr Group
☐ D Pzr Htr Group

NOTE: Placing Pzr Press Master in manual makes automatic operation of 1NC-34A (Pzr PORV) unavailable and should be evaluated using Electronic Risk Assessment Tool. This assessment should be performed prior to placing Pzr Press Master in manual.

☐ 3.4.7.3 **IF** time allows **AND** Unit 1 in Modes 1-4, evaluate unavailablilty of 1NC-34A (Pzr PORV) using Electronic Risk Assessment Tool.

☐ 3.4.7.4 On the DCS Work Station, Pressurizer and PRT graphic, perform the following:

☐ A. Place "PZR PRESS MASTER" in manual.

☐ B. Adjust "PZR PRESS MASTER" output until the following occurs:

☐ C Pzr Htr Group begins cycling
☐ 1NC-27C (A Loop Pzr Spray Control) closes
☐ 1NC-29C (B Loop Pzr Spray Control) closes

☐ C. Place "PZR PRESS MASTER" in auto.

☐ 3.4.7.5 Monitor Pzr pressure for 2 minutes.

3.5 Placing C Pzr Heater Group In Service

☐ 3.5.1 Check closed "C Pzr Htr Grp Sup Bkr".

NOTE: Placing Pzr Press Master in manual makes automatic operation of 1NC-34A (Pzr PORV) unavailable and should be evaluated using Electronic Risk Assessment Tool. This assessment should be performed prior to placing Pzr Press Master in manual.

☐ 3.5.2 **IF** time allows **AND** Unit 1 in Modes 1-4, evaluate unavailablilty of 1NC-34A (Pzr PORV) using Electronic Risk Assessment Tool.

☐ 3.5.3 On the DCS Work Station, Pressurizer and PRT graphic, perform the following:

☐ 3.5.3.1 Place "PZR PRESS MASTER" in manual.

☐ 3.5.3.2 Adjust "PZR PRESS MASTER" to obtain desired output for C Pzr Htr Group.

☐ 3.5.3.3 **IF** desired to operate C Pzr Htr Group in automatic, place "PZR PRESS MASTER" in auto.

3.6 Removing C Pzr Heater Group From Service

☐ 3.6.1 On the DCS Work Station Pressurizer and PRT graphic, perform the following:

☐ 3.6.1.1 Place "PZR PRESS MASTER" in manual.

☐ 3.6.1.2 Adjust "PZR PRESS MASTER" to obtain "0" (zero) output for C Pzr Htr Group.

☐ 3.6.2 **IF** desired to completely remove C Pzr Htr Group from service, open "C Pzr Htr Grp Sup Bkr".

☐ 3.6.3 **IF** desired to operate C Pzr Htr Group in automatic, on the DCS Work Station, place "PZR PRESS MASTER" in auto.

End of Enclosure

In-Plant JPM I

Facility: McGuire Task No.:

Task Title: Control Steam Pressure Locally Using SM PORVs JPM No.: 2010 Systems – In-Plant JPM I

K/A Reference: 039 A4.07 (2.8/2.9)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: ____

Classroom ____ Simulator ____ Plant X

READ TO THE EXAMINEE

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

Initial Conditions: A Loss of Control Room has occurred and AP/1/A/5500/17 (Loss of Control Room) has been implemented.
The procedure is complete through subsequent action step 17.
When Steam Generator pressure is checked in step 17, the RO discovers pressure to be 1185 PSIG and reports this to the CRS.
The CRS desires to reduce pressure below the Safety Valve lift setpoint of 1170 psig.

Task Standard: The operator will open 1SV-1 and 1SV-19 to 10% open and control their position from the Unit 1 exterior doghouse.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)

General References: AP/1/A/5500/17 (Loss of Control Room)

Handouts: AP/1/A/5500/17 (Loss of Control Room), Enclosure 7 (Manual Operation of PORVs)

Initiating Cue: The CRS dispatches you to locally control Steam Generator Pressure with the SM PORV's per AP/1/A/5500/17 (Loss of Control Room) Enclosure 7 (Manual Operation of PORVs).

Time Critical Task: NO

Validation Time: 10 minutes

NOTE: If the installed O_2 monitors in the Doghouses are out of service, operators are expected to use portable O_2 monitors during routine operations. For Time Critical actions that need to be performed in the Doghouses, Safety has waived this requirement. This evaluation is documented in PIP 05-3007. This exception does NOT apply to routine entries or for JPM performance. **If the portable O_2 monitors must be used during performance of this JPM, the time to obtain and operate the O_2 monitor may be subtracted from the Actual JPM Completion Time.**

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 7 of AP/1/A/5500/17.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 1) Establish communication from doghouses to SRO at Aux Shutdown Panel.	The Operator states that they would use Plant Phone or Radio to establish communication with SRO at Unit 1 Aux Shutdown Panel.. **Cue:** **You are in communication with the SRO at the Aux Shutdown Panel.**		
2	(NOTE prior to Step 2) A Main Steam Isolation signal or loss of VI will prevent operation of PORVs from manual loaders.	The operator reads the NOTE and proceeds.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	(Step 2) Operate valves 1SV-19AB (1A Main Steam Line PORV) and 1SV-1AB (1D Main Steam Line PORV) (exterior doghouse) using manual loaders as follows: (Step 2.a) Ensure the following controller knobs are in the full counterclockwise position: Manual loader 1SMML5521 (1A SM PORV (1SV-19) Local Manual Loader) Manual loader 1SMML5491 (1D SM PORV (1SV-1) Local Manual Loader)	The operator rotates 1SV-19 and 1SV-1 controller knobs completely counterclockwise. **Cue:** **Control knob rotated counterclockwise.** **Cue:** **Control knob rotated counterclockwise.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	(Step 2.b) Ensure the following valves are open: A-1 (1A S/G LOCAL MANUAL LOADER INPUT ISOL)	The operator rotates the A-1 and D-1 Local Manual Loader Input Isolation Valves fully counterclockwise.		
		Cue: **Knob rotated counterclockwise.**		
	D-1 (1D S/G LOCAL MANUAL LOADER INPUT ISOL)	**Cue:** **Knob rotated counterclockwise.**		
*5	(Step 2.c) Close the following valves: A-2 (1A S/G C/R MANUAL LOADER OUTPUT ISOL)	The operator rotates the A-2 and D-2 C/R Manual Loader Output Isolation Valves fully clockwise.		
		Cue: **Knob rotated clockwise.**		
	D-2 (1D S/G C/R MANUAL LOADER OUTPUT ISOL)			
		Cue: **Knob rotated clockwise.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*6	(Step 2.d) Open the following valves: A-3 (1A S/G LOCAL MANUAL LOADER OUTPUT ISOL)	The operator rotates the A-3 and D-3 Local Manual Loader Output Isolation Valves fully counterclockwise.		
		Cue: **Knob rotated counterclockwise.**		
	D-3 (1D S/G LOCAL MANUAL LOADER OUTPUT ISOL)	**Cue:** **Knob rotated counterclockwise.**		
*7	(Step 2.e) Adjust "1A SM PORV (1SV-19) LOCAL MANUAL LOADER" as directed by SRO.			
		Cue: **The SRO requests that you adjust the manual loader to 10% open.**		
		The operator rotates the Local Manual Loader clockwise until the needle is at 10%.		
		Cue: **Control knob rotated clockwise and needle is at 10%.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*8	(Step 2.f) Adjust "1D SM PORV (1SV-1) LOCAL MANUAL LOADER" as directed by SRO.	**Cue:** **The SRO requests that you adjust the manual loader to 10% open.**		
		The operator rotates the Local Manual Loader clockwise until the needle is at 10%.		
		Cue: **Control knob rotated clockwise and needle is at 10%.**		
9	(Step 3) Operate the following valves PER instruction tag near valves: 1SV-13 AB (1B S/G PORV) 1SV-7ABC (1C S/G PORV)	The operator contacts the SRO.		
		Cue: **The SRO at the Auxiliary Shutdown Panel states that steam pressure is under control and no further local PORV operation is required.**		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems – In-Plant JPM I

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

A Loss of Control Room has occurred and AP/1/A/5500/17 (Loss of Control Room) has been implemented.
The procedure is complete through subsequent action step 17.

When Steam Generator pressure is checked in step 17, the RO discovers pressure to be 1185 PSIG and reports this to the CRS. The CRS desires to reduce pressure below the Safety Valve lift setpoint of 1170 psig.

INITIATING CUE:

The CRS dispatches you to locally control Steam Generator Pressure with the SM PORV's per AP/1/A/5500/17 (Loss of Control Room) Enclosure 7 (Manual Operation of PORVs).

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.

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__ 1. **Establish communication from doghouses to SRO at Aux Shutdown Panel.**

NOTE A Main Steam Isolation signal or loss of VI will prevent operation of PORVs from manual loaders.

2. **Operate valves 1SV-19AB (1A Main Steam Line PORV) and 1SV-1AB (1D Main Steam Line PORV) (exterior doghouse) using manual loaders as follows:**

   a. Ensure the following controller knobs are in the full counter clockwise position:

   __ Manual loader 1SMML5521 (1A SM PORV (1SV-19) Local Manual Loader)

   __ Manual loader 1SMML5491 (1D SM PORV (1SV-1) Local Manual loader).

   b. Ensure the following valves are OPEN:

   __ A-1 (1A S/G Local Manual Loader Input Isol)

   __ D-1 (1D S/G Local Manual Loader Input Isol).

   c. CLOSE the following valves:

   __ A-2 (1A S/G C/R Manual Loader Output Isol)

   __ D-2 (1D S/G C/R Manual Loader Output Isol).

Operate the following valves PER instruction tag near valves:

__ 1SV-19AB (1A Main Steam Line PORV)

__ 1SV-1AB (1D Main Steam Line PORV).

2. (Continued)

   d. OPEN the following valves:

   ___ A-3 (1A S/G Local Manual Loader Output Isol)

   ___ D-3 (1D S/G Local Manual Loader Output Isol).

___ e. Adjust "1A SM PORV (1SV-19) LOCAL MANUAL LOADER" as directed by SRO.

___ f. Adjust "1D SM PORV (1SV-1) LOCAL MANUAL LOADER" as directed by SRO.

3. **Operate the following valves <u>PER</u> instruction tag near valves:**

___ 1SV-13AB (1B Main Steam Line PORV)

___ 1SV-7ABC (1C Main Steam Line PORV).

In-Plant JPM J

Facility:	McGuire	Task No.:	
Task Title:	Makeup to the Unit 1 KC Surge Tanks	JPM No.:	2010 Systems – In-Plant JPM J
K/A Reference:	008, A2.02, 3.2/3.5		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: ____

Classroom ____ Simulator ____ Plant X

READ TO THE EXAMINEE

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

Initial Conditions: The plant YM system is out of service to allow major modifications to be incorporated.

Unit 1 is operating at 100% power when the KC Surge Tank A and B lo level computer alarms are received.

The surge tank levels are 3.9 feet and decreasing.

The operating crew has implemented AP/1/A/5500/21 (Loss of KC or KC System Leakage).

Several operators have been dispatched to attempt to locate the leak.

RN Pumps 1A and 1B are in service.

Task Standard: The operator correctly manipulates valves, and communicates with the C/R to restore KC Surge Tank level. Flow must be initiated to at least one train of KC in less than or equal to TEN (10) minutes to satisfy the TIME CRITICAL requirements of this JPM.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)

General References: AP/1/A/5500/21 (Loss of KC or KC System Leakage)

PT/0/A/4600/113 (Operator Time Critical Task verification) Enclosure 13.17 (Initiating Makeup to the KC Surge Tank or Isolate KC Header Leak)

Handouts: AP/1/A/5500/21 (Loss of KC or KC System Leakage), Enclosure 3 (Aligning RN Makeup to KC Surge Tank)

Initiating Cue: The CRS directs you to align makeup to both Unit 1 KC Surge Tanks per AP/1/A/5500/21 (Loss of KC or KC System Leakage), Enclosure 3 (Aligning RN Makeup to KC Surge Tank).

This is a Time Critical JPM.

Time Critical Task: YES – 10 Minutes

Validation Time: 8 minutes

NOTE: This JPM should be started from just inside the RCA Entry Point.

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 3 of AP/1/A/5500/21.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Caution prior to Step 1) RN pump must be running while RN to KC emergency makeup is open, to prevent draining KC surge tank back to RN.	The operator reads the Caution and proceeds.		
2	(Step 1) Align one or both of the following flowpaths (Step 1.a or 1.b) as required: (Step 1.a) IF 1A RN Train to 1A KC Surge Tank makeup is desired, THEN: (Step 1.a.1) Ensure 1A RN Pump is on.	The operator recognizes that the 1A RN Pump is ON (Initial Condition).		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(Step 1.a.2) Dispatch operator to perform the following: Unlock and open 1KC-494 (Unit 1 RN Assured Supply to 1A KC Surge Tank Compartment Isol) (aux. bldg, 733 + 10, HH-56, in corner west of 1B1 KC Pump)	The operator removes the lock on 1KC-494.		
		Cue: **The Lock is removed.**		
		The operator rotates the 1KC-494 handwheel in the counter-clockwise direction.		
		Cue: **The handwheel rotates, the Stem rises out of the valve and then stops.**		
	Open 1KC-496 (1A KC Surge Tank Compartment RN Assured Supply Isol) (aux. bldg, 733 + 10, HH-56, in corner west of 1B1 KC Pump).	The operator rotates the 1KC-496 handwheel in the counter-clockwise direction.		
		Cue: **The handwheel rotates, the Stem rises out of the valve and then stops.**		
4	(Step 1.b) IF 1B RN Train to 1B KC Surge Tank makeup is desired, THEN: (Step 1.b.1) Ensure 1B RN Pump is on.	The operator recognizes that the 1B RN Pump is ON (Initial Condition).		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	(Step 1.b.2) Dispatch operator to perform the following: Unlock and open 1KC-497 (Unit 1 RN Assured Supply to 1B KC Surge Tank Compartment Isol) (aux. bldg, 733 + 10, HH-56, in corner west of 1B1 KC Pump)	The operator removes the lock on 1KC-497. **Cue:** **The Lock is removed.** The operator rotates the 1KC-497 handwheel in the counter-clockwise direction. **Cue:** **The handwheel rotates, the Stem rises out of the valve and then stops.** The operator rotates the 1KC-499 handwheel in the counter-clockwise direction. **Cue:** **The handwheel rotates, the Stem rises out of the valve and then stops.** **NOTE Time Critical STOP Time:** _____		
	Open 1KC-499 (1B KC Surge Tank Compartment RN Assured Supply Isol) (aux. bldg, 733 + 10, HH-56, in corner west of 1B1 KC Pump)			
6	(Step 2) IF AT ANY TIME an RN pump trips, THEN dispatch operator to isolate affected trains RN to KC makeup line opened in step 1.	The operator reads the Step and proceeds.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	(Step 3) Adjust makeup rate as required to prevent overflow of KC Surge Tank (approximately 8.5 Ft)	The operator calls the Control Room and asks for the 1A KC Surge Tank level. **Cue:** **The 1A KC Surge Tank level is 4 Ft. and slowly increasing.** The operator calls the Control Room and asks for the 1B KC Surge Tank level. **Cue:** **The 1B KC Surge Tank level is 4 Ft. and slowly increasing.**		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems – In-Plant JPM J

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

The plant YM system is out of service to allow major modifications to be incorporated.

Unit 1 is operating at 100% power when the KC Surge Tank A and B lo level computer alarms are received.

The surge tank levels are 3.9 feet and decreasing.

The operating crew has implemented AP/1/A/5500/21 (Loss of KC or KC System Leakage).

Several operators have been dispatched to attempt to locate the leak.

RN Pumps 1A and 1B are in service.

INITIATING CUE:

The CRS directs you to align makeup to both Unit 1 KC Surge Tanks per AP/1/A/5500/21 (Loss of KC or KC System Leakage), Enclosure 3 (Aligning RN Makeup to KC Surge Tank).

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.

This is a Time Critical JPM.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION **RN pump must be running while RN to KC emergency makeup is open, to prevent draining KC surge tank back to RN.**

1. **Align one or both of the following flowpaths (Step 1.a or 1.b) as required:**

   a. **IF** 1A RN Train to 1A KC Surge Tank makeup is desired, **THEN**:

   __ 1) Ensure 1A RN pump is on.

   2) Dispatch operator to perform the following:

   __ • Unlock and open 1KC-494 (Unit 1 RN Assured Supply to 1A KC Surge Tank Compartment Isol) (aux bldg, 733+10, HH-56, in corner west of 1B1 KC Pump).

   __ • Open 1KC-496 (1A KC Surge Tank Compartment RN Assured Supply Isol) (aux bldg, 733+10, HH-56, in corner west of 1B1 KC Pump).

   __ 1) **GO TO** Step 1.b.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

1. (Continued)

b. **IF** 1B RN Train to 1B KC Surge Tank makeup is desired, **THEN**:

__ 1) Ensure 1B RN pump is on.

1) Perform the following:

__ a) **IF** makeup using A train RN is desired, **THEN RETURN TO** Step 1.a.

__ b) **GO TO** Step 2.

2) Dispatch operator to perform the following:

__ • Unlock and open 1KC-497 (Unit 1 RN Assured Supply to 1B KC Surge Tank Compartment Isol) (aux bldg, 733+10, HH-56, in corner west of 1B1 KC Pump).

__ • Open 1KC-499 (1B KC Surge Tank Compartment RN Assured Supply Isol) (aux bldg, 733+10, HH-56, in corner west of 1B1 KC Pump).

__ 2. **IF AT ANY TIME an RN pump trips, THEN dispatch operator to isolate affected trains RN to KC makeup line opened in Step 1.**

__ 3. **Adjust makeup rate as required to prevent overflow of KC Surge Tank (approximately 8.5 ft).**

In-Plant JPM K

Facility:	McGuire	Task No.:	
Task Title:	Restore Power to KXB Power Panel Board Using Inverter SKX	JPM No.:	2010 Systems – In-Plant JPM K
K/A Reference:	APE 057, AA1.01, 3.7/3.7		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

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

Initial Conditions:	AP/1/A/5500/15 (Loss of Vital or Aux Control Power) has been implemented due to a loss of Aux Control Power Panel Board KXB. Prior to the event, all electrical systems were aligned in their normal operating configurations.
Task Standard:	Inverter SKX is aligned to provide power to KXB power panel board.
Required Materials:	PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)
General References:	AP/1/A/5500/15 (Loss of Vital or Aux Control Power)
Handouts:	Enclosure 24 (Restoring Power to KXB) of AP/1/A/5500/15 (Loss of Vital or Aux Control Power)
Initiating Cue:	The CRS directs you to energize KXB using inverter SKX per Enclosure 24 (Restoring Power to KXB) of AP/1/A/5500/15 (Loss of Vital or Aux Control Power).
Time Critical Task:	NO

Validation Time: 24 minutes

NOTE: Just prior to administering JPM, ensure Key for Key-Operated KXB Static Inverter Alarm Circuit Switch is located in the switch.

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 24 of AP/1/A/5500/15.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Cautions prior to Step 1) Visibly damaged breakers shall not be operated without IAE approval. One attempt at closing a "TRIPPED" breaker is allowed when restoring power to KXB. If a tripped breaker re-opens after being closed, IAE should investigate prior to further operation of the breaker. When closing a tripped breaker, the operator should not stand directly in front of the breaker cubicle.	The operator reads the Cautions and proceeds.		
2	(Step 1) IF AT ANY TIME during performance of this enclosure a breaker trips after being closed, THEN perform the following: (Step 1.a) Notify IAE to investigate cause of breaker tripping. (Step 1.b) Have station management evaluate whether plant conditions warrant continuation of this enclosure prior to completion of IAE's investigation.	The operator reads the Steps and proceeds.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(Step 2) Select method of restoring power to KXB panelboard: • To energize KXB using SKX Inverter, GO TO Step 3. • To energize KXB using KXB Inverter, GO TO Step 4. • To energize KXB from MKB through the KXB Inverter Bypass Panel, GO TO Step 5. • To energize KXB from MKB through the SKX Inverter Bypass Panel, GO TO Step 7.	The operator proceeds to Step 3.		
4	(Step 3) Align SKX Inverter to KXB panelboard as follows: (Step 3.a) On SKX Breaker Alignment Panel, check the following breakers – OPEN: SKX BAP Bkr 1 (SKX AC Output to KXA) SKX BAP Bkr 2 (SKX AC Output to 1KU) SKX BAP Bkr 4 (SKX AC Output to 2KU)	The operator observes the SKX BAP Bkr 1. **Cue:** **Breaker is as you see it.** The operator observes the SKX BAP Bkr 2. **Cue:** **Breaker is as you see it.** The operator observes the SKX BAP Bkr 4. **Cue:** **Breaker is as you see it.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	(Step 3.b) On SKX Static Inverter, perform the following: (Step 3.b.1) Ensure SKX Inv Bkr 3 (SKX Inv AC Output) is open. (Step 3.b.2) Ensure SKX Inv Bkr 2 (DCB to SKX DC Supply) is open. (Step 3.b.3) Ensure SKX Inv Bkr 1 (DCA to SKX DC Supply) is open.	The operator observes the SKX Inv Bkr 3. **Cue:** **Breaker is as you see it.** The operator observes the SKX Inv Bkr 2. **Cue:** **Breaker is as you see it.** The operator observes the SKX Inv Bkr 1. **Cue:** **Breaker is as you see it.**		
6	(Step 3.c) On SKX Static Inverter Bypass Panel, perform the following: • Ensure SKX Byp Pnl Bkr 4 (MKA Alt AC Source Supply) is open. • Ensure SKX Byp Pnl Bkr 5 (MKB Alt AC Source Supply) is open.	The operator observes the SKX Byp Pnl Bkr 4. **Cue:** **Breaker is as you see it.** The operator observes the SKX Byp Pnl Bkr 5. **Cue:** **Breaker is as you see it.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*7	(Step 3.d) Ensure "KXB DISC SWITCH" (Battery Room, Column BB58) is open.	The operator opens the disconnect switch. **Cue:** **Disconnect moved into the down position.**		
*8	(Step 3.e) On SKX Breaker Alignment Panel, use Kirk key to close SKX BAP Bkr 3 (SKX AC Output to KXB)	The operator inserts the Kirk Key, rotates, and moves breaker to the UP position. **Cue:** **The breaker moved into the up position.**		
9	(Step 3.f) Check kirk key in DCB-1D (Static Inverter No. SKX) – INSTALLED.	The operator observes DCB-1D. **Cue:** **The Kirk Key is installed.**		
*10	(Step 3.g) Using kirk key close DCB-1D (Static Inverter No. SKX).	The operator moves breaker to the UP position. **Cue:** **The breaker moved into the up position.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	(Step 3.h) On SKX Static Inverter, perform the following: (Step 3.h.1) Ensure Kirk key installed in SKX Inv Bkr 2 (DCB to SKX DC Supply)	The operator observes SKX Inv Bkr 2. **Cue:** **The Kirk Key is installed.**		
*12	(Step 3.h.2) Place "PRECHARGE" switch to "DCB" position and hold.	The operator rotates the Switch clockwise and holds. **Cue:** **The switch is in the DCB position.**		
*13	(Step 3.h.3) WHEN "PRECHARGE" light has been lit for 10 seconds, THEN perform the following in rapid succession: (Step 3.h.3.a) Release "PRECHARGE" switch (Step 3.h.3.b) Close SKX Inv Bkr 2 (DCB to SKX DC Supply)	**Cue:** **The light has been LIT for 10 seconds.** The operator releases the Switch. The operator moves breaker to the UP position. **Cue:** **The breaker moved into the up position.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
14	(Step 3.h.4) Check the following indications: INVERTER OUTPUT VOLTAGE – 116 -124 VOLTS INVERTER OUTPUT FREQUENCY – 59.7-60.3 HZ	The operator observes the Inverter Output Voltage. **Cue:** **Meter indicates 120 volts.** The operator observes the Inverter Output Frequency. **Cue:** **Meter indicates 60 Hz.**		
*15	(Step 3.h.5) Close SKX Inv Bkr 3 (SKX Inv AC Output)	The operator moves breaker to the UP position. **Cue:** **The breaker moved into the up position.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*16	(Step 3.i) On SKX Static Inverter Bypass Panel, perform the following: (Step 3.i.1) Ensure "MANUAL BYPASS SWITCH" selected to "NORMAL OPERATION"	The operator observes the MANUAL BYPASS SWITCH position. **Cue:** **Switch is in the ALTERNATE AC SOURCE TO LOAD position.** The operator rotates the Switch counter-clockwise. **Cue:** **Switch is in the NORMAL position.**		
17	(Step 3.i.2) Check "INVERTER SUPPLYING LOAD" light - LIT	The operator observes the INVERTER SUPPLYING LOAD light. **Cue:** **The light is LIT.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*18	(Step 3.i.3) Ensure SKX Byp Pnl Bkr 6 (SKX Byp Pnl AC Output) is closed.	The operator observes the SKX Byp Pnl Bkr 6. **Cue:** **Breaker is as you see it.** The operator moves breaker to the UP position. **Cue:** **The breaker moved into the up position.**		
19	(Step 3.i.4) Check the following indications: "SYSTEM OUTPUT VOLTAGE – 116 -124 VOLTS SYSTEM OUTPUT FREQUENCY – 59.7-60.3 HZ SYSTEM OUTPUT CURRENT – LESS THAN 292 AMPS	The operator observes the System Output Voltage. **Cue:** **Meter indicates 120 volts.** The operator observes the System Output Frequency. **Cue:** **Meter indicates 60 Hz.** The operator observes the System Output Current. **Cue:** **Meter indicates 150 amps.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
20	(Step 3.j) On SKX Static Inverter, ensure "ALARM CIRCUIT" is "ON".	The operator observes the Alarm Circuit Switch. **Cue:** **The Switch is in the OFF position.** The operator rotates the Switch counter-clockwise. **Cue:** **The Switch is in the ON position.**		
21	(Step 3.k) On KXB Static Inverter, ensure "ALARM CIRCUIT" is "OFF".	The operator observes the Alarm Circuit Switch. **Cue:** **The Switch is in the ON position.** The operator rotates the Switch clockwise. **Cue:** **The Switch is in the OFF position.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
22	(Step 3.l) Notify Control Room that KXB is energized.	The operator contacts the Control Room and notifies that KXB is energized. **Cue:** **As CRS, acknowledge.**		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2010 Systems – In-Plant JPM K

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

AP/1/A/5500/15 (Loss of Vital or Aux Control Power) has been implemented due to a loss of Aux Control Power Panel Board KXB.

Prior to the event, all electrical systems were aligned in their normal operating configurations.

INITIATING CUE:

The CRS directs you to energize KXB using inverter SKX per Enclosure 24 (Restoring Power to KXB) of AP/1/A/5500/15 (Loss of Vital or Aux Control Power).

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.

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CAUTION □ **Visibly damaged breakers shall not be operated without IAE approval.**

□ **One attempt at closing a "TRIPPED" breaker is allowed when restoring power to KXB. If a tripped breaker re-opens after being closed, IAE should investigate prior to further operation of the breaker.**

□ **When closing a tripped breaker, the operator should not stand directly in front of the breaker cubicle.**

1. **IF AT ANY TIME during performance of this enclosure a breaker trips after being closed, THEN perform the following:**

   __ a. Notify IAE to investigate cause of breaker tripping.

   __ b. Have station management evaluate whether plant conditions warrant continuation of this enclosure prior to completion of IAE's investigation.

2. **Select method of restoring power to KXB panelboard:**

   __ □ To energize KXB using SKX Inverter, **GO TO** Step 3.

   __ □ To energize KXB using KXB Inverter, **GO TO** Step 4.

   __ □ To energize KXB from MKB through the KXB Inverter Bypass Panel, **GO TO** Step 5.

   __ □ To energize KXB from MKB through the SKX Inverter Bypass Panel, **GO TO** Step 7.

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3. **Align SKX Inverter to KXB panelboard as follows:**

a. On SKX Breaker Alignment Panel, check the following breakers - OPEN:

__ □ SKX BAP Bkr 1 (SKX AC Output to KXA)

__ □ SKX BAP Bkr 2 (SKX AC Output to 1KU)

__ □ SKX BAP Bkr 4 (SKX AC Output to 2KU).

b. On SKX Static Inverter, perform the following:

__ 1) Ensure SKX Inv Bkr 3 (SKX Inv AC Output) is open.

__ 2) Ensure SKX Inv Bkr 2 (DCB to SKX DC Supply) is open.

__ 3) Ensure SKX Inv Bkr 1 (DCA to SKX DC Supply) is open.

c. On SKX Static Inverter Bypass Panel, perform the following:

__ □ Ensure SKX Byp Pnl Bkr 4 (MKA Alt AC Source Supply) is open.

__ □ Ensure SKX Byp Pnl Bkr 5 (MKB Alt AC Source Supply) is open.

__ d. Ensure "KXB DISC SWITCH" (Battery Room, column BB58) is open.

a. Perform the following:

__ 1) Notify Control Room to evaluate swapping bus aligned to SKX to another source.

__ 2) **IF** bus aligned to SKX cannot be swapped to another source, **THEN RETURN TO** Step 2.

3) **IF** bus aligned to SKX can be swapped to another source, **THEN** perform the following:

__ a) Swap **PER** OP/0/A/6350/001 B (125VDC - 240/120VAC Auxiliary Control Power System).

__ b) Do not continue until swap complete.

3. (Continued)

__ e. On SKX Breaker Alignment Panel, use Kirk key to close SKX BAP Bkr 3 (SKX AC Output to KXB).

__ f. Check kirk key in DCB - 1D (Static Inverter No. SKX) - INSTALLED.

f. Perform the following:

__ 1) Ensure DCA - 1D (Static Inverter No. SKX) is open.

__ 2) Remove kirk key from DCA - 1D.

__ 3) Insert kirk key in DCB - 1D.

__ g. Using Kirk key close DCB - 1D (Static Inverter No. SKX).

h. On SKX Static Inverter, perform the following:

__ 1) Ensure Kirk key installed in SKX Inv Bkr 2 (DCB to SKX DC Supply).

__ 2) Place "PRECHARGE" switch to "DCB" position and hold.

3) **WHEN** "PRECHARGE" light has been lit 10 seconds, **THEN** perform the following substeps in rapid succession:

__ a) Release "PRECHARGE" switch.

__ b) Close SKX Inv Bkr 2 (DCB to SKX DC Supply).

4) Check the following indications:

__ ☐ "INVERTER OUTPUT VOLTAGE" - 116 - 124 VOLTS

__ ☐ "INVERTER OUTPUT FREQUENCY" - 59.7 - 60.3 HZ.

4) Perform the following:

__ a) **IF** Inverter output voltage is less than 110 Volts, **THEN RETURN TO** Step 2.

__ b) **IF** Inverter output voltage is greater than 110 Volts, **THEN** notify IAE to investigate abnormal indication as time allows.

3. (Continued)

__ 5) Close SKX Inv Bkr 3 (SKX Inv AC Output).

i. On SKX Static Inverter Bypass Panel, perform the following:

__ 1) Ensure "MANUAL BYPASS SWITCH" selected to "NORMAL OPERATION".

__ 2) Check "INVERTER SUPPLYING LOAD" light - LIT.

__ 3) Ensure SKX Byp Pnl Bkr 6 (SKX Byp Pnl AC Output) is closed.

4) Check the following indications:

__ □ "SYSTEM OUTPUT VOLTAGE" - 116 - 124 VOLTS

__ □ "SYSTEM OUTPUT FREQUENCY" - 59.7 - 60.3 HZ

__ □ "SYSTEM OUTPUT CURRENT" - LESS THAN 292 AMPS.

__ j. On SKX Static Inverter, ensure "ALARM CIRCUIT" is "ON".

__ k. On KXB Static Inverter, ensure "ALARM CIRCUIT" is "OFF".

__ l. Notify Control Room that KXB is energized.

__ 2) Depress "INVERTER TO LOAD" pushbutton.

4) Perform the following:

__ a) **IF** System output voltage is less than 110 Volts, **THEN RETURN TO** Step 2.

__ b) **IF** System output voltage is greater than 110 Volts, **THEN** notify IAE to investigate abnormal indication as time allows.

3. (Continued)

NOTE With SKX Inverter in service, MKB is normally aligned to SKX Inverter as a backup power supply in case the inverter fails. If MKB is reliable, it should be aligned as a backup power source.

m. Contact station management to evaluate closing the following breakers to restore backup power to SKX Static Inverter:

__ □ SKX Byp Pnl Bkr 5 (MKB Alt AC Source Supply) on SKX Static Inverter Bypass Panel

__ □ MKB - 2C (Inverter No. SKX Manual Bypass SW Alternate Supply).

__ n. Exit this enclosure.

4. **Align KXB Inverter to KXB panelboard as follows:**

   a. Perform the following at KXB Static Inverter:

   __ 1) Ensure KXB Inv Sw 2 (KXB Inverter AC Output) is open.

   __ 2) Ensure KXB Inv Bkr 1 (DCB to KXB DC Supply) is open.

__ b. On SKX Breaker Alignment Panel, ensure SKX BAP Bkr 3 (SKX AC Output to KXB) is open.

__ c. Ensure MKB - 1B (Inverter No. KXB Manual Bypass SW Alternate Supply) is open.

__ d. Ensure DCB - 2G (Static Inverter No. KXB) is closed.

__ e. Close "KXB DISC SWITCH" (Battery Room, column BB58).

4. (Continued)

f. Perform the following at KXB Static Inverter:

__ 1) Depress and hold "PRECHARGE" pushbutton.

2) **WHEN** "PRECHARGE" light has been lit 10 seconds, **THEN** perform the following substeps in rapid succession:

__ a) Release "PRECHARGE" pushbutton.

__ b) Close KXB Inv Bkr 1 (DCB to KXB DC Supply).

3) Check the following indications:

__ □ "INVERTER OUTPUT VOLTAGE" - 116 - 124 VOLTS

__ □ "INVERTER OUTPUT FREQUENCY" - 59.7 - 60.3 HZ.

__ 4) Close KXB Inv Sw 2 (KXB Inverter AC Output).

3) Perform the following:

__ a) **IF** Inverter output voltage is less than 110 Volts, **THEN RETURN TO** Step 2.

__ b) **IF** Inverter output volts are greater than 110 Volts, **THEN** notify IAE to investigate abnormal indication as time allows.

4. (Continued)

g. Perform the following at the KXB Static Inverter Bypass Panel:

__ 1) Ensure KXB Byp Pnl Bkr 3 (KXB Byp Pnl AC Output) is closed.

__ 2) Ensure "MANUAL BYPASS SWITCH" in "NORMAL OPERATION".

__ 3) Check "INVERTER SUPPLYING LOAD" light - LIT.

4) Check the following indications:

__ □ "SYSTEM OUTPUT CURRENT" - LESS THAN 292 AMPS

__ □ "SYSTEM OUTPUT VOLTAGE" - 116 - 124 VOLTS

__ □ "SYSTEM OUTPUT FREQUENCY" - 59.7 - 60.3 HZ.

__ h. On KXB Static Inverter, ensure "ALARM CIRCUIT" is "ON".

__ i. **IF** SKX Static Inverter shutdown, **THEN** ensure "ALARM CIRCUIT" is "OFF" on SKX Static Inverter.

__ j. Notify Control Room that KXB panelboard is energized.

__ 3) Depress "INVERTER TO LOAD" pushbutton.

4) Perform the following:

__ a) **IF** System output voltage is less than 110 Volts, **THEN RETURN TO** Step 2.

__ b) **IF** System output voltage is greater than 110 Volts, **THEN** notify IAE to investigate abnormal indication as time allows.

4. (Continued)

NOTE With KXB Inverter in service, MKB is normally aligned to KXB Inverter as a backup power supply in case the inverter fails. If MKB is reliable, it should be aligned as a backup power source.

k. Contact station management to evaluate closing the following breaker to restore backup power to KXB Static Inverter:

__ □ MKB - 1B (Inverter No. KXB Manual Bypass SW Alternate Supply).

__ l. Exit this enclosure.

5. **Align Distribution Center MKB to KXB panelboard through the KXB Inverter Bypass Panel as follows:**

__ a. On 1LAMP1 Panel Module 1LAM12 (located in Battery Room, column DD-55), check #2 LED "MKB REG. POWER SOURCE LOW" light - DARK.

a. Perform the following:

__ 1) **IF** another source is available to align to KXB panelboard, **THEN RETURN TO** Step 2.

NOTE Distribution Center MKB can be energized by one of the following methods:

- From MCC SMXT, which is fed from 2SLXA (normal) or 1SLXH (alternate).

OR

- Cross-tied to Distribution Center MKA, which is fed from MCC SMXS, which is fed from 1SLXF (normal) or 2SLXF (alternate).

__ 2) Attempt to energize MKB from MCC SMXT.

__ 3) **IF** MKB cannot be energized from SMXT, **THEN** evaluate cross-tying MKA and MKB **PER** Enclosure 33 (Cross-tying MKA and MKB).

__ 4) Do not continue until MKB is energized.

__ b. Check MKA - 2C (Bus MKA Tie Bkr To 240/120 VAC Bus MKB) - OPEN.

__ b. Observe Note prior to Step 6 and **GO TO** Step 6.

5. (Continued)

c. Check 2KU panelboard aligned to its normal power source as follows:

__ 1) On SKX Breaker Alignment Panel, check SKX BAP Bkr 4 (SKX AC Output to 2KU) - OPEN.

__ 1) **GO TO** Step 5.e.

2) On 2KU Inv Byp Panel, check the following indications:

__ 2) **GO TO** Step 5.g.

__ □ "INVERTER SUPPLYING LOAD" light - LIT.

__ □ "2KU MAN BYP SW" in - "NORMAL OPERATION".

__ d. **GO TO** Step 5.k.

e. Check 2KU panelboard aligned to SKX Inverter as follows:

__ e. **GO TO** Step 5.g.

__ 1) On SKX Static Inverter Bypass Panel, check "INVERTER SUPPLYING LOAD" light - LIT.

__ 2) On SKX Static Inverter Bypass Panel, check the "MANUAL BYPASS SWITCH" in - "NORMAL OPERATION".

__ f. **GO TO** Step 5.k.

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5. (Continued)

g. In Unit 2 MG Set Room, check 2KDCS1 panelboard aligned to its normal power source as follows:

__ 1) On SKDCS Alignment Panel (column CC-59), check "SKDCS SELECTOR SWITCH" in - "OFF".

1) Perform the following:

__ a) **IF** "SKDCS SELECTOR SWITCH" in "MKA" position, **THEN GO TO** Step 5.g.2).

b) **IF** "SKDCS SELECTOR SWITCH" in "MKB" position, **THEN** perform the following:

(1) On SKDCS UPS, record status of "INVERTER TO LOAD" pushbutton LED:

__ □ LIT OR __ □ DARK

__ (2) **IF** LED is dark, **THEN** observe Caution prior to Step 5.i and **GO TO** Step 5.i.

__ (3) **IF** LED is lit, **THEN GO TO** Step 5.k.

__ 2) On 2KDCS UPS, check "INVERTER TO LOAD" pushbutton LED - LIT.

__ 2) Observe Caution prior to Step 5.i and **GO TO** Step 5.i.

__ h. **GO TO** Step 5.k.

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5. (Continued)

CAUTION **If KXB panelboard is aligned to MKB in subsequent steps, the transformer supplying MKB may become overloaded, depending on actual loads at that moment.**

i. Contact station management to perform the following prior to continuing:

__ □ Evaluate reducing the number of loads on MKB.

__ □ Evaluate the potential for transformer overload with KXB aligned to MKB.

__ □ Evaluate energizing KXB panelboard from another source **PER** Step 2.

j. Perform one of the following based on previous evaluation:

__ □ **IF** station management decides to proceed with placing KXB on MKB, **THEN GO TO** Step 5.k.

OR

__ □ **IF** station management desires to align KXB panelboard to another source, **THEN RETURN TO** Step 2.

__ k. On SKX Breaker Alignment panel, ensure SKX BAP Bkr 3 (SKX AC Output to KXB) is open.

l. Perform the following at KXB Static Inverter:

__ 1) Ensure KXB Inv Sw 2 (KXB Inverter AC Output) is open.

__ 2) Ensure KXB Inv Bkr 1 (DCB to KXB DC Supply) is open.

__ m. Close "KXB DISC SWITCH" (Battery Room, column BB58).

__ m. **RETURN TO** Step 2.

__ n. Close MKB - 1B (Inverter No. KXB Manual Bypass SW Alternate Supply).

__ n. **RETURN TO** Step 2.

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5. (Continued)

o. Perform the following at the KXB Static Inverter Bypass Panel:

__ 1) Ensure KXB Byp Pnl Bkr 3 (KXB Byp Pnl AC Output) is closed.

__ 2) Place "MANUAL BYPASS SWITCH" to "ALTERNATE AC SOURCE TO LOAD".

3) Check the following indications:

__ □ "SYSTEM OUTPUT CURRENT" - LESS THAN 292 AMPS

__ □ "SYSTEM OUTPUT VOLTAGE" - 116 - 124 VOLTS

__ □ "SYSTEM OUTPUT FREQUENCY" - 59.7 - 60.3 HZ.

__ p. **IF** SKX Static Inverter shutdown, **THEN** ensure "ALARM CIRCUIT" is "OFF" on SKX Static Inverter.

__ q. On KXB Static Inverter, ensure "ALARM CIRCUIT" is "OFF".

__ r. Notify Control Room that KXB panelboard is energized.

__ s. Exit this enclosure.

__ 2) **RETURN TO** Step 2.

3) Perform the following:

__ a) **IF** System output voltage is less than 110 Volts, **THEN RETURN TO** Step 2.

__ b) **IF** System output voltage is greater than 110 Volts, **THEN** notify IAE to investigate abnormal indication as time allows.

NOTE The transformer connected to MKA and MKB can safely carry only three of eight possible loads. Any of the following panelboards may already be aligned to MKA/MKB:

- ☐ KRA
- ☐ KRB
- ☐ 1KU
- ☐ KXA
- ☐ 2KU
- ☐ 1KDCS1
- ☐ 2KDCS1.

6. **Determine the number of panelboards currently energized from MKA/MKB as follows:**

__ a. Check MKA - 1A (240/120 VAC Regulated Power Pnlbd No. KRA) - CLOSED.	__ a. **GO TO** Step 6.c.
__ b. Circle "KRA" in Note prior to Step 6.	
__ c. Check MKB - 1A (240/120 VAC Regulated Power Pnlbd No. KRB) - CLOSED.	__ c. **GO TO** Step 6.e.
__ d. Circle "KRB" in Note prior to Step 6.	
e. On SKX Breaker Alignment Panel, check the following breakers - OPEN:	e. Perform the following:
__ ☐ SKX BAP Bkr 1 (SKX AC Output to KXA)	__ 1) Record below which panelboard is associated with the closed breaker (i.e. KXA, 1KU, or 2KU): _____
__ ☐ SKX BAP Bkr 2 (SKX AC Output to 1KU)	__ 2) **GO TO** Step 6.g.
__ ☐ SKX BAP Bkr 4 (SKX AC Output to 2KU).	

6. (Continued)

__ f. **GO TO** Step 6.h.

g. Check if SKX Inverter is in service as follows:

__ ☐ On SKX Static Inverter Bypass Panel, check "INVERTER SUPPLYING LOAD" light - LIT.

__ ☐ On SKX Static Inverter Bypass Panel, check the "MANUAL BYPASS SWITCH" in - "NORMAL OPERATION".

__ g. Circle the panelboard in the Note prior to Step 6 that was recorded in Step 6.e.

h. Check if 1KU Inverter is in service as follows:

__ 1) Check "1KU DISC SWITCH" (Battery Room, column BB54) - CLOSED.

__ 1) **GO TO** Step 6.i.

2) Check the following indications:

__ 2) Circle "1KU" in Note prior to Step 6.

__ ☐ On 1KU Inv Byp Panel, check "INVERTER SUPPLYING LOAD" light - LIT.

__ ☐ On 1KU Inv Byp Panel, check "1KU MAN BYP SW" in - "NORMAL OPERATION".

6. (Continued)

i. Check if KXA Inverter is in service as follows:

__ 1) Check "KXA DISC SWITCH" (Battery Room, column BB54) - CLOSED.

__ 1) **GO TO** Step 6.j.

2) Check the following indications:

__ 2) Circle "KXA" in Note prior to Step 6.

__ ☐ On KXA Static Inverter Bypass Panel, check "INVERTER SUPPLYING LOAD" light - LIT.

__ ☐ On KXA Static Inverter Bypass Panel, check the "MANUAL BYPASS SWITCH" in - "NORMAL OPERATION".

j. Check if 2KU Inverter is in service as follows:

__ 1) Check "2KU DISC SWITCH" (Battery Room, column BB58) - CLOSED.

__ 1) **GO TO** Step 6.k.

2) Check the following indications:

__ 2) Circle "2KU" in Note prior to Step 6.

__ ☐ On 2KU Inv Byp Panel, check "INVERTER SUPPLYING LOAD" light - LIT.

__ ☐ On 2KU Inv Byp Panel, check "2KU MAN BYP SW" in - "NORMAL OPERATION".

6. (Continued)

k. In Unit 2 MG Set Room, check if 1KDCS1 Inverter is in service as follows:

__ 1) On SKDCS Alignment Panel (column CC-59), check "SKDCS SELECTOR SWITCH" in - "OFF".

1) Perform the following:

__ a) **IF** "SKDCS SELECTOR SWITCH" in "MKB" position, **THEN GO TO** Step 6.k.2).

b) **IF** "SKDCS SELECTOR SWITCH" in "MKA" position, **THEN** perform the following:

(1) On SKDCS UPS, record status of "INVERTER TO LOAD" pushbutton LED:

__ □ LIT OR __ □ DARK

__ (2) **IF** LED is dark, **THEN** circle "1KDCS1" in Note prior to Step 6.

__ (3) **GO TO** Step 6.l.

__ 2) On 1KDCS UPS, check "INVERTER TO LOAD" pushbutton LED - LIT.

__ 2) Circle "1KDCS1" in Note prior to Step 6.

6. (Continued)

I. In Unit 2 MG Set Room, check if 2KDCS1 Inverter is in service as follows:

__ 1) On SKDCS Alignment Panel (column CC-59), check "SKDCS SELECTOR SWITCH" in - "OFF".

1) Perform the following:

__ a) **IF** "SKDCS SELECTOR SWITCH" in "MKA" position, **THEN GO TO** Step 6.I.2).

b) **IF** "SKDCS SELECTOR SWITCH" in "MKB" position, **THEN** perform the following:

(1) On SKDCS UPS, record status of "INVERTER TO LOAD" pushbutton LED:

__ □ LIT OR __ □ DARK

__ (2) **IF** LED is dark, **THEN** circle "2KDCS1" in Note prior to Step 6.

__ (3) **GO TO** Step 6.m.

__ 2) On 2KDCS UPS, check "INVERTER TO LOAD" pushbutton LED - LIT.

__ 2) Circle "2KDCS1" in Note prior to Step 6.

__ m. Check the total number of panelboards circled in Note prior to Step 6 - LESS THAN OR EQUAL TO TWO.

__ m. Observe Caution prior to Step 6.o and **GO TO** Step 6.o.

__ n. **RETURN TO** Step 5.k.

6. (Continued)

CAUTION **If KXB panelboard is aligned to MKB in subsequent steps, the transformer supplying both MKA and MKB may become overloaded, depending on actual loads at that moment.**

o. Contact station management to perform the following prior to continuing:

__ ☐ Evaluate reducing the number of loads on MKA and MKB.

__ ☐ Evaluate the potential for transformer overload with KXB aligned to MKA/MKB.

__ ☐ Evaluate energizing KXB panelboard from another source **PER** Step 2.

p. Perform one of the following based on previous evaluation:

__ ☐ **IF** station management decides to proceed with placing KXB on MKB, **THEN RETURN TO** Step 5.k.

OR

__ ☐ **IF** station management desires to align KXB panelboard to another source, **THEN RETURN TO** Step 2.

7. **Align Distribution Center MKB to KXB panelboard through the SKX Static Inverter Bypass Panel as follows:**

   a. On SKX Breaker Alignment Panel, check the following breakers - OPEN:

   ___ ☐ SKX BAP Bkr 1 (SKX AC Output to KXA)

   ___ ☐ SKX BAP Bkr 2 (SKX AC Output to 1KU)

   ___ ☐ SKX BAP Bkr 4 (SKX AC Output to 2KU).

   a. Perform the following:

   ___ 1) Notify Control Room to evaluate swapping bus aligned to SKX to another source.

   ___ 2) **IF** bus aligned to SKX cannot be swapped to another source, **THEN RETURN TO** Step 2.

   3) **IF** bus aligned to SKX can be swapped to another source, **THEN** perform the following:

   ___ a) Swap **PER** OP/0/A/6350/001 B (125VDC - 240/120VAC Auxiliary Control Power System).

   ___ b) Do not continue until swap complete.

7. (Continued)

__ b. On 1LAMP1 Panel Module 1LAM12 (located in Battery Room, column DD-55), check #2 LED "MKB REG. POWER SOURCE LOW" light - DARK.	b. Perform the following: __ 1) **IF** another source is available to align to KXB panelboard, **THEN RETURN TO** Step 2.
	NOTE Distribution Center MKB can be energized by one of the following methods: □ From MCC SMXT, which is fed from 2SLXA (normal) or 1SLXH (alternate). OR □ Cross-tied to Distribution Center MKA, which is fed from MCC SMXS, which is fed from 1SLXF (normal) or 2SLXF (alternate). __ 2) Attempt to energize MKB from MCC SMXT. __ 3) **IF** MKB cannot be energized from SMXT, **THEN** evaluate cross-tying MKA and MKB **PER** Enclosure 33 (Cross-tying MKA and MKB). __ 4) Do not continue until MKB is energized.
__ c. Check MKA - 2C (Bus MKA Tie Bkr To 240/120 VAC Bus MKB) - OPEN.	__ c. Observe Note prior to Step 8 and **GO TO** Step 8.

7. (Continued)

d. Check 2KU panelboard aligned to its normal power source as follows:

__ ☐ On 2KU Inv Byp Panel, check "INVERTER SUPPLYING LOAD" light - LIT.

__ ☐ On 2KU Inv Byp Panel, check "2KU MAN BYP SW" in - "NORMAL OPERATION".

__ e. **GO TO** Step 7.j.

f. In Unit 2 MG Set Room, check 2KDCS1 panelboard aligned to its normal power source as follows:

__ 1) On SKDCS Alignment Panel (column CC-59), check "SKDCS SELECTOR SWITCH" in - "OFF".

__ 2) On 2KDCS UPS, check "INVERTER TO LOAD" pushbutton LED - LIT.

__ d. **GO TO** Step 7.f.

1) Perform the following:

__ a) **IF** "SKDCS SELECTOR SWITCH" in "MKA" position, **THEN GO TO** Step 7.f.2).

b) **IF** "SKDCS SELECTOR SWITCH" in "MKB" position, **THEN** perform the following:

(1) On SKDCS UPS, record status of "INVERTER TO LOAD" pushbutton LED:

__ ☐ LIT OR __ ☐ DARK

__ (2) **IF** LED is dark, **THEN** observe Caution prior to Step 7.h and **GO TO** Step 7.h.

__ (3) **IF** LED is lit, **THEN GO TO** Step 7.j.

__ 2) Observe Caution prior to Step 7.h and **GO TO** Step 7.h.

7. (Continued)

__ g. **GO TO** Step 7.j.

CAUTION **If KXB panelboard is aligned to MKB in subsequent steps, the transformer supplying MKB may become overloaded, depending on actual loads at that moment.**

h. Contact station management to perform the following prior to continuing:

__ ☐ Evaluate reducing the number of loads on MKB.

__ ☐ Evaluate the potential for transformer overload with KXB aligned to MKB.

__ ☐ Evaluate energizing KXB panelboard from another source **PER** Step 2.

i. Perform one of the following based on previous evaluation:

__ ☐ **IF** station management decides to proceed with placing KXB on MKB, **THEN GO TO** Step 7.j.

OR

__ ☐ **IF** station management desires to align KXB panelboard to another source, **THEN RETURN TO** Step 2.

j. On SKX Static Inverter, perform the following:

__ 1) Ensure SKX Inv Bkr 3 (SKX Inv AC Output) is open.

__ 2) Ensure SKX Inv Bkr 2 (DCB to SKX DC Supply) is open.

__ k. Ensure "KXB DISC SWITCH" (Battery Room, column BB58) is open.

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7. (Continued)

__ l. Check kirk key in MKB - 2C (Inverter No. SKX Manual Bypass SW Alternate Supply) - INSTALLED.	l. Perform the following: __ 1) Ensure MKA-1, F1C (Inverter No. SKX Manual Bypass SW Alternate Supply) is open. __ 2) Remove kirk key from MKA-1, F1C. __ 3) Insert kirk key in MKB - 2C.
__ m. Using Kirk key, close MKB - 2C (Inverter No. SKX Manual Bypass SW Alternate Supply).	__ m. **RETURN TO** Step 2.
__ n. On SKX Breaker Alignment Panel, use Kirk key to close SKX BAP Bkr 3 (SKX AC Output to KXB).	__ n. **RETURN TO** Step 2.
o. Perform the following at the SKX Static Inverter Bypass Panel:	
__ 1) Using Kirk key, close SKX Byp Pnl Bkr 5 (MKB Alt AC Source Supply).	__ 1) **RETURN TO** Step 2.
__ 2) Close SKX Byp Pnl Bkr 6 (SKX Byp Pnl AC Output).	__ 2) **RETURN TO** Step 2.
__ 3) Ensure the "MANUAL BYPASS SWITCH" is selected to "ALTERNATE AC SOURCE TO LOAD".	__ 3) **RETURN TO** Step 2.
4) Check the following indications:	4) Perform the following:
__ □ "SYSTEM OUTPUT VOLTAGE" - 116 - 124 VOLTS	__ a) **IF** System output voltage is less than 110 Volts, **THEN RETURN TO** Step 2.
__ □ "SYSTEM OUTPUT FREQUENCY" - 59.7 - 60.3 HZ	__ b) **IF** System output voltage is greater than 110 Volts, **THEN** notify IAE to investigate abnormal indication as time allows.
__ □ "SYSTEM OUTPUT CURRENT" - LESS THAN 292 AMPS.	

7. (Continued)

__ p. On SKX Static Inverter, ensure "ALARM CIRCUIT" is "OFF".

__ q. On KXB Static Inverter, ensure "ALARM CIRCUIT" is "OFF".

__ r. Notify Control Room that KXB panelboard is energized.

__ s. **WHEN** time allows, **THEN** review breaker manipulations made in this enclosure and evaluate restoring breakers to normal as appropriate.

__ t. Exit this enclosure.

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NOTE The transformer connected to MKA and MKB can safely carry only three of eight possible loads. Any of the following panelboards may already be aligned to MKA/MKB:

□ KRA

□ KRB

□ 1KU

□ KXA

□ 2KU

□ 1KDCS1.

□ 2KDCS1.

8. **Determine the number of panelboards currently energized from MKA/MKB as follows:**

__ a. Check MKA - 1A (240/120 VAC Regulated Power Pnlbd No. KRA) - CLOSED.	__ a. **GO TO** Step 8.c.
__ b. Circle "KRA" in Note prior to Step 8.	
__ c. Check MKB - 1A (240/120 VAC Regulated Power Pnlbd No. KRB) - CLOSED.	__ c. **GO TO** Step 8.e.
__ d. Circle "KRB" in Note prior to Step 8.	
e. Check if 1KU Inverter is in service as follows:	__ e. Circle "1KU" in Note prior to Step 8.
__ □ On 1KU Inv Byp Panel, check "INVERTER SUPPLYING LOAD" light - LIT.	
__ □ On 1KU Inv Byp Panel, check "1KU MAN BYP SW" in - "NORMAL OPERATION".	

8. (Continued)

f. Check if KXA Inverter is in service as follows:

__ ☐ On KXA Static Inverter Bypass Panel, check "INVERTER SUPPLYING LOAD" light - LIT.

__ ☐ On KXA Static Inverter Bypass Panel, check the "MANUAL BYPASS SWITCH" in - "NORMAL OPERATION".

__ f. Circle "KXA" in Note prior to Step 8.

g. Check if 2KU Inverter is in service as follows:

__ ☐ On 2KU Inv Byp Panel, check "INVERTER SUPPLYING LOAD" light - LIT.

__ ☐ On 2KU Inv Byp Panel, check "2KU MAN BYP SW" in - "NORMAL OPERATION".

__ g. Circle "2KU" in Note prior to Step 8.

8. (Continued)

h. In Unit 2 MG Set Room, check if 1KDCS1 Inverter is in service as follows:

__ 1) On SKDCS Alignment Panel (column CC-59), check "SKDCS SELECTOR SWITCH" in - "OFF".

1) Perform the following:

__ a) **IF** "SKDCS SELECTOR SWITCH" in "MKB" position, **THEN GO TO** Step 8.h.2).

b) **IF** "SKDCS SELECTOR SWITCH" in "MKA" position, **THEN** perform the following:

(1) On SKDCS UPS, record status of "INVERTER TO LOAD" pushbutton LED:

__ □ LIT OR __ □ DARK

__ (2) **IF** LED is dark, **THEN** circle "1KDCS1" in Note prior to Step 8.

__ (3) **GO TO** Step 8.i.

__ 2) On 1KDCS UPS, check "INVERTER TO LOAD" pushbutton LED - LIT.

__ 2) Circle "1KDCS1" in Note prior to Step 8.

8. (Continued)

i. In Unit 2 MG Set Room, check if 2KDCS1 Inverter is in service as follows:

__ 1) On SKDCS Alignment Panel (column CC-59), check "SKDCS SELECTOR SWITCH" in - "OFF".

1) Perform the following:

__ a) **IF** "SKDCS SELECTOR SWITCH" in "MKA" position, **THEN GO TO** Step 8.i.2).

b) **IF** "SKDCS SELECTOR SWITCH" in "MKB" position, **THEN** perform the following:

(1) On SKDCS UPS, record status of "INVERTER TO LOAD" pushbutton LED:

__ □ LIT OR __ □ DARK

__ (2) **IF** LED is dark, **THEN** circle "2KDCS1" in Note prior to Step 8.

__ (3) **GO TO** Step 8.j.

__ 2) On 2KDCS UPS, check "INVERTER TO LOAD" pushbutton LED - LIT.

__ 2) Circle "2KDCS1" in Note prior to Step 8.

__ j. Check the total number of panelboards circled in Note prior to Step 8 - LESS THAN OR EQUAL TO TWO.

__ j. Observe Caution prior to Step 8.l and **GO TO** Step 8.l.

__ k. **RETURN TO** Step 7.j.

8. (Continued)

CAUTION **If KXB panelboard is aligned to MKB in subsequent steps, the transformer supplying both MKA and MKB may become overloaded, depending on actual loads at that moment.**

l. Contact station management to perform the following prior to continuing:

__ Evaluate reducing the number of loads on MKA and MKB.

__ Evaluate the potential for transformer overload with KXB aligned to MKA/MKB.

__ Evaluate energizing KXB panelboard from another source **PER** Step 2.

m. Perform one of the following based on previous evaluation:

__ **IF** station management decides to proceed with placing KXB on MKB, **THEN RETURN TO** Step 7.j.

OR

__ **IF** station management desires to align KXB panelboard to another source, **THEN RETURN TO** Step 2.