ES-301

Control Room/In-Plant Systems Outline FINAL

Form ES-301-2

Faci	ity: McGuire Date of	Examination:	8/2/10
Exar	n Level (circle one): RO (only) / SRO(I) / SRO (U) Operatir	ng Test No.:	N10-1
Con	rol 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
с.	056 Condensate System Swap Hotwell/CM Booster Pumps	S, N, A	45
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		7
g.	075 Circulating Water System Isolate the Circulating Water System During Turbine Building Flooding		8
h.	010 Pressurizer Pressure Control System Remove Pressurizer Heaters from Service	S, N, A	3
In-P	ant 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

Control Room/In-Plant Systems Outline FINAL

@ 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)Iternate 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	$\geq 1(1) \geq 1(1) \geq 1(1)$	
(N)ew or (M)odified from bank including 1(A)	≥ 2 (5) / ≥ 2 (4) / ≥ 1 (1)	
(P)revious 2 exams	$\leq 3(2) / \leq 3(2) / \leq 2(1)$ (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 <u>PER</u> 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

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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

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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.

<u>SIM JPM A</u>

2010 Systems - Control Room JPM A

NUREG 1021, Revision 9

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Job Performance Measure Worksheet	

Facility:	McGuire	Task No.:	
Task Title:	Transfer the NI Pumps from Cold Leg Recirc to Hot Leg Recirc	JPM No.:	<u>2010 Systems - Control</u> <u>Room JPM A</u>
K/A Reference:	006, A4.01, 4.1/3.9		
Examinee:		NRC Examiner:	:
Facility Evaluator:		Date:	
Method of testing:			
Simulated Performa	ance:	Actual Performa	ance: X
Classro	oom Simulator X	Plant	

READ TO THE EXAMINEE

2010 Systems - Control Room JPM A

Appendix C

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 <u>PER</u> EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirculation).
Time Critical Task:	NO
Validation Time:	8 minutes

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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

<u>OR</u>

- 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.

Page 4 of 9 PERFORMANCE INFORMATION

(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 Sim	nulator in FREEZE until opera	itor is rea	ady 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.		

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Form ES-C-1

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.		

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Form ES-C-1

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.I) 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.		

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Form ES-C-1

PERFORMANCE	INFORMATION

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:

App	end	ix	С

Page 8 of 9 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: _____



	Appendix C	Form ES-C-1
		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 <u>PER</u> EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirculation).

UNIT 1

A. <u>Purpose</u>

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).

EP/1/A	MN 4/5000 UNI	S D/ES-1.4 T 1	TRANSFE	R TO HOT	LEG F	RECIRC	PAGE NO. 2 of 5 Rev. 4	
		ACTION/EX	PECTED RESPONSE			RESPONSE NOT OBTAIN	ED	
C. <u>O</u>	perate	or Actions						
1.	Ali fol	gn NI flow p lows:	eath for Hot Leg Recirc as	5				
	a.	Stop 1A NI	Pump.					
-	b.	Close 1NI-1 Leg Isol).	18A (Train A NI To Cold					
_	C.	Check 1NI-	118A (Train A NI To Cold		c. Pe	rform the following:		
		Leg 1301/ - C			1)	IF 1NI-118A is in interm position, <u>THEN</u> wait up t seconds for valve to cor movement.	ediate to 30 nplete valve	
					2)	IF 1NI-118A is closed, <u>T</u> TO Step 1.d.	<u>'HEN GO</u>	
					3)	IF 1NI-118A will not clos GO TO Step 1.g.	se, <u>THEN</u>	
-	d.	Open 1NI-1 Hot Leg).	21A (Train A NI To B & C					
	e.	Check 1NI-	121A (Train A NI To B & C		e. Pe	rform the following:		
		Hot Log) - C			1)	<u>IF</u> 1NI-121A is in intermo- position, <u>THEN</u> wait up to seconds for valve to con- movement.	ediate to 30 nplete valve	
					2)	<u>IF</u> 1NI-121A is open, <u>TH</u> Step 1.f.	IEN <u>GO TO</u>	
					3)	IF 1NI-121A will not ope GO TO Step 1.g.	n, <u>THEN</u>	
_	f.	Start 1A NI	Pump.					
	g.	Stop 1B NI	Pump.					
_	h.	Close 1NI-1 Leg Isol).	50B (Train B NI To Cold					
	i.	Close 1NI-1 Isol).	62A (NI Pumps Cold Leg					

MNS EP/1/A/5000/ES-1.4 UNIT 1	TRANSFE	R TO HO ⁻	T LEG	RECIRC	PAGE NO. 3 of 5 Rev. 4
ACTION/EX	PECTED RESPONSE			RESPONSE NOT OBTAIN	ED
1. (Continued) j. Open 1NI-1 Hot Leg).	52B (Train B NI To A & D				
k. Check if 1B — • 1NI-150B Isol) - CL — • 1NI-152B Leg) - OF	NI Pump should be started (Train B NI To Cold Leg OSED (Train B NI To A & D Hot PEN.	:	k. P 1) 2) 3)	 erform the following: <u>IF</u> valve(s) in intermedia <u>THEN</u> wait up to 30 sec allow valves to complete movement. <u>IF</u> valves are properly a <u>THEN GO TO</u> Step 1.I. <u>IF</u> either valve fails to go 	ite position, onds to a valve ligned, o to its
 I. Start 1B NI m. Check the fermionitor Light A-1 "1NI-ISOL CLC B-1 "1NI-ISOL OPI A-8 "1NI-ISOL CLC A-3 "1NI-LEG ISOI B-8 "1NI-ISOL OPI 	Pump. ollowing windows on ESF at Panel, Group 5 - LIT: 118A TRAIN A NI TO CL DSED" 121A TRAIN A NI TO HL EN" 150 TRAIN B NI TO CL DSED" 162A NI PUMPS COLD L CLOSED" 152 TRAIN B NI TO HL EN".		. m. N pr	otify station management ositions.	of valve
2. Check flow fro ESTABLISHED	m at least one train of NI).		Perfo a. N no b. <u>IF</u> of <u>G</u>	orm the following: otify station management ot indicated. both trains of NI have fail perate in Hot Leg Recirc m O TO Step 4.	that NI flow ed to node, <u>THEN</u>

MNS EP/1/A/5000/ES-1.4 UNIT 1		TRANSFE	TRANSFER TO HOT LEG RECIRC		PAGE NO 4 of 5 Rev. 4	•	
	ACTION/EX	PECTED RESPONSE			RESPONSE NOT OBTAIN	ED	
3.	<u>RETURN TO</u> p effect.	rocedure and step in					
4.	Align ND S/I flo as follows:	ow path for Hot Leg Reci	rc				
	a. Check the f	ollowing valves - CLOSED):	a. Pe	rform the following:		
	• 1ND-1B (Isol)	1C NC Loop to ND Pumps	3	1)	Contact station manage evaluate guidance to ali for Hot Leg Recirc	ment to gn NI or ND	
	• 1ND-2AC Pumps C	C (1C NC Loop To ND ont Inside Isol)		2)	RETURN TO procedure	and step in	
	• 1ND-30A Hotlegs Is	(1A ND To 1B & 1C NC sol)					
	• 1ND-15B Legs Isol	(1B ND To 1B & 1C NC ⊢).	lot				
-	_ b. Open 1NI-1 Leg Cont O	83B (U1 ND to B & C Hot utside Isol).		b. Pe	rform the following:		
	-			1)	Contact station manage evaluate guidance to ali for Hot Leg Recirc.	ment to gn NI or ND	
		7		2)	RETURN TO procedure effect.	and step in	
	c. For A ND tra	ain:					
	1) Check 1 to NS C	NS-43A (1A ND Hx Outlet ont Outside Isol) - CLOSE	: D.	1)	<u>GO</u> <u>TO</u> Step 4.d.		
	2) Close 1I Cold Lee	NI-173A (1A ND to A & B gs Cont Outside Isol)		2)	<u>GO</u> <u>TO</u> Step 4.d.		
	3) Open 11 NC Hotl	ND-30A (1A ND To 1B & 1 egs Isol).	С	3)	Open 1NI-173A.		
	4) Check tl ESF Mo LIT:	he following windows on nitor Light Panel, Group 5	-	4)	Notify station managem positions.	ent of valve	
	• A-6 "/ ISOL	INI-183B ND TO HL B & C OPEN"	;				

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

r.

MNS TRANSFER TO HOT LEG RECIRC EP/1/A/5000/ES-1.4 UNIT 1		ECIRC	PAGE NO 5 of 5 Rev. 4	•		
ACTION/EX	PECTED RESPONSE			RESPONSE NOT OBTAIN	ED	
4. (Continued)						
d. For B ND tra	ain:					
1) Check 1 to NS Co	NS-38B (1B ND Hx Outlet ont Outside Isol) - CLOSE	D.	1)	<u>GO TO</u> Step 5.		
2) Close 11 Cold Leg	NI-178B (1B ND to C & D gs Outside Isol).		2)	<u>GO TO</u> Step 5.		
3) Open 1N NC Hot I	ND-15B (1B ND To 1B & 1 Legs Isol).	С	3)	Open 1NI-178B.		
4) Check th ESF Mor LIT:	ne following windows on a nitor Light Panel, Group 5	-	4)	Notify station manageme positions.	ent of valve	
• A-6 "1 ISOL	NI-183B ND TO HL B & C OPEN"	:				
— • A-7 "1 CL C	NI-178B TRAIN B ND TO & D CLOSED".					
5. Check flow to I one train of ND	NC hot legs from at least) - ESTABLISHED.		Contac guidan Recirc.	ct station management ice to align NI or ND foi	to evaluate [.] Hot Leg	
6. <u>RETURN TO</u> pr effect.	ocedure and step in					
		END				
	MNS EP/1/A/5000/ES-1.4 UNIT 1 ACTION/EX 4. (Continued) d. For B ND tra 1) Check 1 to NS CA 2) Close 11 Cold Leg 3) Open 1N NC Hot 4) Check tt ESF Mo LIT: 0 A-6 "1 ISOL 0 A-7 "1 CL C 5. Check flow to 1 one train of NE 6. <u>RETURN TO pr</u> effect.	MNS EP/1/A/5000/ES-1.4 UNIT 1 ACTION/EXPECTED RESPONSE 4. (Continued) d. For B ND train: 	MNS EP/1/A/5000/ES-1.4 UNIT 1 ACTION/EXPECTED RESPONSE 4. (Continued) d. For B ND train: 	MNS EP/1/A/5000/ES-1.4 UNIT 1 ACTION/EXPECTED RESPONSE 4. (Continued) d. For B ND train: -1) Check 1NS-38B (1B ND Hx Outlet to NS Cont Outside Isol) - CLOSED1) -2) Close 1NI-173B (1B ND to C & D) Cold Legs Outside Isol). -3) Open 1ND-15B (1B ND To 1B & 1C3) NC Hot Legs Isol). 4) Check the following windóws on4) ESF Monitor Light Panel, Group 5 - LIT: - • A-6 "1NI-133B 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 guidan Recirc: - 6. <u>RETURN TO</u> procedure and step in effect.	MNS EP/1/A/5000/ES-1.4 UNIT 1 ACTION/EXPECTED RESPONSE RESPONSE RESPONSE NOT OBTAIN 4. (Continued) 4. (Continued) 4. (Continued) 4. (Continued) 5. Check the following windows on ESF Monitor Light Panel, Group 5- LIT: - 0. A-6 "1/NL-178B TRAIN B ND TO CL C & D CLOSED. - 3. Open 1ND-15B (1B ND To 1B & 1C NC Hot Legs Isol). 4) Check the following windows on ESF Monitor Light Panel, Group 5- LIT: - 0. A-6 "1/NL-178B TRAIN B ND TO CL C & D CLOSED. - 5. Check flow to NC hot legs from at least one train of ND - ESTABLISHED. - 6. <u>RETURN TO</u> procedure and step in effect. - 4.9	MNS TRANSFER TO HOT LEG RECIRC PAGE NO Sof 5 Rev. 4 UNIT 1 ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED 4. (Continued)

<u>SIM JPM B</u>

n an Article A

2010 Systems - Control Room JPM B

NUREG 1021, Revision 9

Appendix C	Page 2 d	of 11	Form ES-C-1
	Job Performance Me	asure Worksheet	
Facility:	McGuire	Task No.:	
Task Title:	Respond to ND System Malfunct While at Mid Loop	ion JPM No.:	<u>2010 Systems - Control</u> <u>Room JPM B</u> (Alternate Path)
K/A Reference:	005, A4.01, 3.6/3.4		
Examinee:		NRC Examiner:	
Facility Evaluator:		Date:	
Method of testing:			
Simulated Performa Classro	ance: oom SimulatorX	Actual Performa Plant	ance: <u>X</u>

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)

Appendix C	Page 3 of 11	Form ES-C-1
	Job Performance Measure Worksheet	
Initiating Cue:	The CRS has directed you to implement AP/1/A/ ND System Leakage) <u>AND</u> control ND flow so th maintained at its present temperature.	/5500/19 (Loss of ND or hat NC Temperature is
Time Critical Task:	NO	
Validation Time:	8 minutes	

Page 4 of 11 Job Performance Measure Worksheet

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

<u>OR</u>

- 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.

Page 5 of 11 PERFORMANCE INFORMATION

(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	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.						

Page 6 of 11 PERFORMANCE INFORMATION

Form ES-C-1

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°F, 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. 		

Page 7 of 11 PERFORMANCE INFORMATION

Form ES-C-1

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).		

Page 8 of 11 PERFORMANCE INFORMATION

Form ES-C-1

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	S/U	FOR UNSAT
		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

The operator checks for an

determines ND pump is <u>not</u> <u>cavitating</u>, and proceeds to

oscillation in flow, motor amps and pressure, then

RNO step 4.b.3.

3000 gpm.

11

(Step 4.b RNO b.2) IF ND

Pump(s) cavitating,

THEN:....

Page 9 of 11 PERFORMANCE INFORMATION

Form ES-C-1

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) 	The operator rotates the 1ND-29 manual loader counter-clockwise until the needle is at 100%.		
	• 1ND-14 (1B ND Hx Outlet Isol)	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.

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STOP TIME:

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Anno	ndiv	1 .
AUDE		• •
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Page 10 of 11 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
	Data
Examiner's Signature:	Date:

.

	Appendix C	Form ES-C-1	
	JPM CUE SHEET		
1 1 1			
	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) <u>AND</u> control ND flow so that NC Temperature is maintained at its present temperature.	

UNIT 1

A. Purpose

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

1.1

1 1

UNIT 1

PAGE NO. 2 of 217 Rev. 22

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

B <u>Symptoms</u>

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.

LOSS OF I	ND OR ND	SYSTEM	LEAKAGE
		••••	

PAGE NO. 3 of 217 Rev. 22

 MNS AP/1/A/5500/19 UNIT 1	LOSS OF ND OR ND SYSTEM LEAKAGE PAGE 3 of 2 Rev. 2		PAGE NO 3 of 217 Rev. 22	
ACTION/EX	PECTED RESPONSE		RESPONSE NOT OB'	FAINED
C. <u>Operator Actions</u>				
<u>CAUTION</u> Chang indica	les in NC pressure could tions.	result in ir	naccuracies in NC Level	
1. Check ND pun	nps - ANY RUNNING.		<u>GO TO</u> Step 5.	
2. Check if ND pu running:	umps should remain			
a. NC Level -	GREATER THAN	i	a. Perform the following:	
4 INCHES.			1) Stop ND pumps.	
			2) CLOSE the followir	ıg valves:
			CLOSE 1ND-30/ & 1C NC Hotlegs	۹ (1A ND To 1B الالالة Isol)
			• CLOSE 1ND-33 Isol)	(1A ND Hx Byp
			• CLOSE 1ND-18 Bypass)	(1B ND Hx
			• CLOSE 1ND-158 & 1C NC Hot Leg	3 (1B ND To 1B gs Isol).
			3) GO TO Step 5.	

MNS AP/1/A/5500/19	LOSS OF ND	OR ND S	YSTEM LEAKAGE	PAGE NO. 4 of 217 Poy. 22
UNIT 1				
ACTION/	EXPECTED RESPONSE		RESPONSE NOT OBTAIN	IED
2. (Continued)				
b. Check NC	subcooling based on core		b. Perform the following:	
exit I/Cs	- GREATER THAN 0°F.		1) Stop ND pump(s).	
			2) Ensure all NC pumps o	ff.
			3) CLOSE the following va	alves:
			 CLOSE 1ND-30A (14 & 1C NC Hotlegs Iso 	A ND To 1B I)
			• CLOSE 1ND-33 (1A Isol)	ND Hx Byp
			 CLOSE 1ND-18 (1B Bypass) 	ND Hx
<				3 ND To 1B ol).
			4) GO TO Step 5.	
c. Check the	following valves - OPEN:		c. Perform the following:	
● 1ND-1E Isol)	3 (1C NC Loop to ND Pumps	i	1) Stop ND pump(s).	

- 1ND-2AC (1C NC Loop To ND Pumps Cont Inside Isol).
- ____1) Stop ND pump(s).
- ____ 2) GO TO Step 5.

MNS
AP/1/A/5500/19

LOSS OF ND OR ND SYSTEM LEAKAGE

PAGE NO. 5 of 217 Rev. 22

UNIT 1

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- 2. (Continued)
 - d. <u>IF AT ANY TIME</u> NC level goes below 4 inches <u>OR</u> NC subcooling based on core exit T/Cs goes below 0°F, <u>THEN</u> 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. <u>IF AT ANY TIME</u> NC level is less than 15 inches, <u>THEN</u> observe Note prior to Step 4 and perform Step 4.
- ____ b. <u>GO TO</u> Step 5.
| MNS |
|----------------|
| AP/1/A/5500/19 |

UNIT 1

ACTION/	EXPECTED	RESPONSE
		1120101101

RESPONSE NOT OBTAINED

<u>NOTE</u>

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.
 - 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).

1.1

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

_____a. <u>GO TO</u> Step 4.c.

is seen. If the valve inadvertently closes, it may be pulsed open to the desired flow.

- 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) <u>IF</u> ND pump(s) cavitating, <u>THEN</u> 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) <u>GO TO</u> Step 4.f.

SIM JPM C

2010 Systems - Control Room JPM C

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Appendix C		F	Page 2 of	⁻ 14	Form ES-C-1
	Job Performance Measure Worksheet				
Facility:	McGuire			Task No.:	
Task Title:	<u>Swap Hotwe</u>	II/CM Booster	<u>Pumps</u>	JPM No.:	<u>2010 Systems - Control</u> <u>Room JPM C</u> (Alternate Path)
K/A Reference:	056, A2.04,	2.6/2.8			
Examinee:				NRC Examiner:	:
Facility Evaluator:				Date:	
Method of testing:					
Simulated Performa	ance:			Actual Performa	ance: X
Classro	oom	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

Appendix C	Page 3 of 14	Form ES-C-1
	Job Performance Measure Worksheet	
General References:	OP/1/A/6250/001 (Condensate and Feedwater Syster	n)
	OP/1/A/6100/010 I (Annunciator Response for Panel 7 A3, HTWL PUMP C STRNR HI D/P	1AD-8), Window
	SOMP 01-02 (Reactivity Management)	
	OMP 8-1 (Star and Peer Checking)	
Handouts:	Enclosure 4.5 (Swapping Hotwell/CM Booster Pumps) OP/1/A/6250/001 (Condensate and Feedwater Syster place-keeping through step 3.1.) of n) marked up for
Initiating Cue:	The CRS has directed you to start the C Hotwell Pum Hotwell Pump in standby, and then start the C Conder Pump and place the A Condensate Booster Pump in s Enclosure 4.5 of OP/1/A/6250/001, Condensate and F	p, and place the A nsate Booster standby using Feedwater System.
	All outstanding R&Rs that may have impacted the per procedure have been evaluated.	formance of this
Time Critical Task:	NO	
Validation Time:	15 minutes	

¢,

Appendix C

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

<u>OR</u>

- 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.

ż.

(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.		

Page 6 of 14 PERFORMANCE INFORMATION

Form ES-C-1

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 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	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)	Note and proceeds.		

Page 7 of 14 PERFORMANCE INFORMATION

Form ES-C-1

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.		

Page 8 of 14 PERFORMANCE INFORMATION

Form ES-C-1

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.)	The operator reads the Note and proceeds.		
	(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 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.		

2010 Systems - Control Room JPM C

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Page 9 of 14 PERFORMANCE INFORMATION

Form ES-C-1

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:	The operator contacts the NEO to check the Auxiliary Oil Pump running.		
	 1A CM Booster Auxiliary Oil Pump 1B CM Booster Auxiliary Oil Pump 1C CM Booster Auxiliary Oil Pump 	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.		

Page 10 of 14 PERFORMANCE INFORMATION

Form ES-C-1

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.		

Page 11 of 14 PERFORMANCE INFORMATION

Form ES-C-1

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.					

!

Page 12 of 14 PERFORMANCE INFORMATION

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: Clea	ar XMT-CM011 when operator	takes th	e 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:

Appendix	С
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Page 13 of 14 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: _____

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.

Enclosure 4.5

OP/**1**/A/6250/001 Page 1 of 4

Swapping Hotwell / CM Booster Pumps

1. Limits and Precautions

12

- $\sqrt{1.1}$ This procedure is Reactivity Management related because it controls activities that can affect core reactivity by changing NC System temperature. (R.M.)
- $\sqrt{1.2}$ Minimum Hotwell Pump flow is 1700 gpm.
- $\sqrt{1.3}$ Minimum CM Booster Pump flow is 3000 gpm.

2. Initial Conditions

- <u>Sim</u> 2.1 <u>IF</u> in Mode 1 <u>OR</u> 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}
 - ✓ <u>IF</u> the OAC is out of service, ambient air temperature can be checked with hand held thermometer in the vicinity of the Hotwell Pumps.
- $\mathbf{N} \stackrel{\text{MARK}}{\longrightarrow} 2.2$ 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)

Unit 1

		Enclosure 4.5 OP/1/A/6250/001
		Swapping Hotwell / CM Booster Pumps Page 2 of 4
NOTE:	å	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}
	å	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.
A THE 2.3	<u>IF</u> fo	ambient air temperature at Condensate Booster Pumps is less than 50°F, ensure the llowing indicate greater than 50°F:
	Fo	or 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)
	Fo	or 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)
	Fo	or 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)

rş.

Unit 1

Enclosure 4.5

OP/**1**/A/6250/001 Page 3 of 4

Swapping Hotwell / CM Booster Pumps

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

Unit 1

Swapping Hotwell / CM Booster Pumps

· *

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

2010 Systems - Control Room JPM D

NUREG 1021, Revision 9

Appendix C Page		of 10	Form ES-C-1		
	Job Performance Me	asure Worksheet			
Facility:	McGuire	Task No.:			
Task Title:	<u>Manually Actuate Containment</u> Spray System	JPM No.:	<u>2010 Systems - Control</u> <u>Room JPM D</u> (Alternate Path)		
K/A Reference:	026 A2.03 4.1/4.4				
Examinee:		NRC Examiner:			
Facility Evaluator:		Date:			
Method of testing:	Method of testing:				
Simulated Perform	ance:	Actual Performa	ance: X		
Classro	oom SimulatorX	_ 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.

Appendix C	Page 3 of 10	Form ES-C-1
	Job Performance Measure Worksheet	
Initiating Cue:	The CRS has directed you to check the NS System accordance with step 10 of FR-Z.1, "Response to Pressure."	m in Operation in High Containment
Time Critical Task:	NO	
Validation Time:	15 minutes	

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Appendix C

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.

Page 5 of 10 PERFORMANCE INFORMATION

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

Appendix C

Page 6 of 10 PERFORMANCE INFORMATION

Form ES-C-1

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).	The operator observes the Green status light LIT.		
	1NS-29A (1A NS Hx Outlet Cont Outside Isol).	The operator observes the Green status light LIT.		
	1NS-12B (1B NS Hx Outlet Cont Outside Isol).	The operator observes the Green status light LIT.		
	1NS-15B (1B NS Hx Outlet Cont Outside Isol).	The operator observes the Green status light LIT.		
		The operator proceeds to the Step 10.f RNO.		

Appendix C

Page 7 of 10 PERFORMANCE INFORMATION

Form ES-C-1

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:	The operator recognizes that both trains of NS are aligned to the FWST, and proceeds.		
	(Step 10.f RNO 1)a) Open affected valve(s).	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.		

Page 8 of 10 PERFORMANCE INFORMATION

Form ES-C-1

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:

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1 YP	pein		\mathbf{U}

Page 9 of 10 VERIFICATION OF COMPLETION

Job Performance Measure No.:	<u>2010 Systems - Control Ro</u>	oom JPM D
Examinee's Name:		
Date Performed:		
Facility Evaluator:		
Number of Attempts:		
Time to Complete:		
Question Documentation:		
Result:	SAT UNSAT	
Examiner's Signature		Data

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."			

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UNIT 1

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A. Purpose

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

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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.

EP/1/A/	MNS 5000/FR-Z.1 J NIT 1	RESPONSE TO HI	GH CONT	AINMENT PRESSURE	PAGE NO. 2 of 45 Rev. 16
	ACTION/EX	PECTED RESPONSE		RESPONSE NOT OBTAIN	ED
С. <u>Ор</u>	erator Actions				
<u>N</u> 1.	IF loss of eme occurred, <u>THE</u> completed as t	rgency coolant recirc has <u>N</u> this procedure may be time allows.	5		
<u>/</u> 2.	Monitor Foldo	ut Page.			
<u> </u>	Stop all NC pu	mps.			
<u> </u>	Ensure all RV off.	pumps are in manual and	ł		
NOT	<u>E</u> Operator n EP/1/A/50	nay have been dispatched 00/E-0 (Reactor Trip Or Sa	to close b afety Inject	reakers in next step by ion).	
5.	Ensure operat white tags and breakers:	or dispatched to remove I close the following			
\checkmark	• 1EMXA-R2A Cont Outside bldg, 750, FF	(1A ND To A&B Cold Leg Isol Motor (1NI-173A)) (a -54, FF-55)	s ux		
<u>v</u>	• 1EMXB1-6B Leg Cont Ou (aux bldg, 73	(1B ND To C&D NC Cold tside Isol Motor (1NI-178B 3, GG-55, GG-56).))		
<u>/</u> 6.	Check contain THAN 15 PSIG	ment pressure - LESS		<u>GO</u> <u>TO</u> Step 9.	
7.	Check any NS	pump - ON.	V	<u>GO TO</u> Step 9.	
NOT	E The remai Completio higher pric	nder of this EP may be cor n of this EP should be dela prity actions are required.	mpleted wi ayed if faul	th the priority of a yellow path EF ted S/G has occurred, or other	2.
8.	Perform the re allows.	mainder of this EP as tin	ne		

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MNS EP/1/A/5000/FR-Z.1 UNIT 1	RESPONSE TO HIC	GH CONTAI	NMENT PRESSURE	PAGE NO. 3 of 45 Rev. 16
ACTION/EX	PECTED RESPONSE		RESPONSE NOT OBTA	INED
9. Check contain	ment isolation:	_		
	, - IN SERVICE.	а. —	 Perform the following on train(s): 1) <u>IF</u> Phase A or B valve open by another EP, may be left open in n 2) Check ESF Monitor L follows: Ensure Group 1 Phare dark. 	e is required THEN valve ext steps. .ight Panel as
			NOTE OAC driven summary light Group 4 will n work. Only v with individual windows need be checked in step.	ts in ot alves t to next
			 Ensure Group 4 Phare lit. Share Phase A value 	nase A valves
			EP/1/A/5000/G-1 (Ge Enclosures), Enclosu A Valve Checklist) are	es in neric re 11 (Phase e closed.
			4) Ensure Phase B valve EP/1/A/5000/G-1 (Ge Enclosures), Enclosu B Valve Checklist) are	es in neric re 12 (Phase e closed.
		_	_ 5) <u>GO TO</u> Step 10.	

MNS EP/1/A/5000/FR-Z.1

RESPONSE TO HIGH CONTAINMENT PRESSURE

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".
- 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. <u>GO TO</u> Step 11.

- b. Establish containment isolation on energized train(s) as follows:
- 1) <u>IF</u> Phase A or B valve is required open by another EP, <u>THEN</u> 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.

_____a. <u>GO TO</u> Step 10.d.

MNS EP/1/A/5000/FR-Z.1

RESPONSE TO HIGH CONTAINMENT PRESSURE

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		_			

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:
 - <u>IF</u> FWST level has remained greater than 33 inches ("FWST LEVEL LO-LO" alarm), <u>THEN</u> perform the following:
 - _ a) Align valves.
 - ____ b) GO TO Step 10.e.
 - <u>IF</u> NS pump suction has been aligned in EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc), <u>THEN</u> perform the following:
 - a) <u>IF</u> 1NI-185A (1A ND Pump Suction From Cont Sump Isol) is open, <u>THEN</u> 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) <u>IF</u> 1NI-184B (1B ND Pump Suction From Cont Sump Isol) is open, <u>THEN</u> 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.
| MNS
EP/1/A/5000/FR-Z.1
UNIT 1 | RESPONSE TO HIGH CONTAINMENT PRESSURE PAG
6 c
Rev | | PAGE NO.
6 of 45
Rev. 16 |
|-------------------------------------|---|--|--|
| ACTION/EX | PECTED RESPONSE | RESPONSE NOT OBTAIN | ED |
| ACTION/EX
10. (Continued)
 | Ainment pressure -
THAN 3 PSIG.
Dellowing NS pump discharg
EN:
(1A NS Hx Outlet Cont
sol)
(1A NS Hx Outlet Cont
sol)
(1B NS Hx Outlet Cont
sol). | e. <u>GO TO</u> Step 11. e. <u>GO TO</u> Step 11. i. Perform the following: i. <u>IF</u> both NS trains alignet <u>THEN</u> perform the following: a) Open affected valves b) <u>IF</u> all four valves are <u>THEN</u> establish NS Enclosure 2 (NS Sy CPCS Failures). c) <u>GO TO</u> Step 10.g. 2) <u>WHEN</u> either alarm "COLEVEL GREATER THA on 1AD-14 or 1AD-15, perform the following: Open the following: Open the following was an other the stable stable is of the stable o | ed to FVVST,
wing:
(s).
closed,
<u>PER</u>
stem
ONT SUMP
N 3 FT" is lit
<u>THEN</u>
valves:
Hx Outlet
)
Hx Outlet
)
Hx Outlet
)
Hx Outlet
)
Hx Outlet
)
Hx Outlet
) |

- 1

MNS EP/1/A/5000/FR-Z.1 UNIT 1	RESPONSE TO HIGH CONTAINMENT PRESSURE PAGE NO. 7 of 45 Rev. 16		PAGE NO. 7 of 45 Rev. 16	
ACTION/EX	PECTED RESPONSE		RESPONSE NOT OBTAI	NED
10. (Continued)				
g. Check NS p	umps - ON.		g. Perform the following:	
			 <u>IF</u> both NS trains align <u>THEN</u> perform the follo 	ed to FWST, owing:
			a) Start pump(s) with suction and discha	available rge flowpaths.
			b) <u>IF</u> both pumps off, establish NS <u>PER</u> (NS System CPCS)	<u>THEN</u> Enclosure 2 Failures).
	· · · ·		c) <u>GO TO</u> Step 11.	
			 <u>WHEN</u> either alarm "C LEVEL GREATER TH/ on 1AD-14 or 1AD-15, perform the following: 	ONT SUMP AN 3 FT" is lit <u>THEN</u>
			a) Start pump(s) with suction and discha	available rge flowpaths.
	·.		b) <u>IF</u> both pumps off, establish NS <u>PER</u> (NS System CPCS	<u>THEN</u> Enclosure 2 Failures).
11. Check Phase E Enclosure 3 (P Equipment).	8 HVAC equipment <u>PER</u> hase B HVAC			
12. Check the follo	owing - CLOSED:		Close valve(s).	
• All MSIVs				
• All MSIV bypa	ass valves.			
13. Check steamlin	nes intact:		<u>IF</u> any S/G pressure going d	own in an v S/G
• All S/G press UP	ures - STABLE OR GOING	3	uncontrolled manner <u>OR</u> any S/G depressurized, <u>THEN</u> isolate any fau S/G(s) <u>PER</u> Enclosure 5 (Faulted S/(
• All S/Gs - PR	ESSURIZED.		isolation <i>j</i> .	

<u>SIM JPM E</u>

2010 Systems - Control Room JPM E

NUREG 1021, Revision 9

Appendix C	Page 2	2 of 11	Form ES-C-1
	Job Performance M	leasure Worksheel	:
Facility:	McGuire	Task No.:	
Task Title:	Separate from the Electrical Gri due to Low Grid Frequency	<u>d</u> JPM No.∶	<u>2010 Systems - Control</u> <u>Room JPM E</u> (Alternate Path)
K/A Reference:	APE 077, AA2.06, 3.4/3.5		
Examinee:	· · · ·	NRC Examiner	:
Facility Evaluator:		Date:	
Method of testing:			
Simulated Perform	ance:	Actual Perform	ance: X
Classro	oom SimulatorX	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)

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Appendix C	Page 3 of 11	Form ES-C-1
	Job Performance Measure Worksheet	
Handouts:	AP/1/A/5500/05 (Generator Voltage and Electrical Gri marked up to Step 15.	d Disturbances)
Initiating Cue:	The CRS has directed you to separate from the Electi delay in accordance with Step 15 of AP/1/A/5500/05 (and Electrical Grid Disturbances).	rical Grid without Generator Voltage
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.

<u>OR</u>

- 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.

Page 5 of 11 PERFORMANCE INFORMATION

(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	Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.					
1	(Step 15) Separate from the Grid as follows:	The operator calls SOC and notifies them that Unit 1 is separating from the Grid.				
	(Step 15.a) Notify SOC 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.				

Page 6 of 11 PERFORMANCE INFORMATION

Form ES-C-1

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

Page 7 of 11 PERFORMANCE INFORMATION

Form ES-C-1

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 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), Enclosure 4.1 (Turbine Generator Load Change), Enclosure 4.1		REQUIRED FOR UNSAT

Page 8 of 11 PERFORMANCE INFORMATION

Form ES-C-1

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.I, 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.		

Page 9 of 11 PERFORMANCE INFORMATION

Form ES-C-1

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*17	(Step 15.I) 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:

Appendix C	Ap	pend	ix	С
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Page 10 of 11 VERIFICATION OF COMPLETION

Job Performance Measure No.:	2010 Systems - Control Roc	om JPM E
Examinee's Name:		
Date Performed:		
Facility Evaluator:		
Number of Attempts:		
Time to Complete:		
Question Documentation:		
Result:	SAT UNSAT	
Examiner's Signature:		Date:

2010 Systems - Control Room JPM E

Appendix C	Form ES-C-1
	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).

4

GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES

UNIT 1

A. <u>Purpose</u>

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.

......

GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES

UNIT 1

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.

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AP/1/	MNS /A/5500/05 J NIT 1	GENERATOR VO	DLTAGE A	ND ELECTRIC GRID NCES	PAGE NO. 3 of 27 Rev. 8
С. <u>Ор</u> е	erator Actions				
<u>/</u> 1.	Announce occ	urrence on page.			
<u>_</u> 2.	Ensure dispate	cher is aware of problem	-		
<u> </u>	Notify Unit 2 to AP/2/A/5500/05 Electric Grid D	o evaluate implementing 5 (Generator Voltage and isturbances).			
4.	Check Unit 1 G	Generator - TIED TO GRIE)	<u>GO TO</u> Step 20.	
5.	<u>IF AT ANY TIM</u> than 100%, <u>TH</u> maintain react	<u>E</u> reactor power is greate <u>EN</u> reduce turbine load t or power less than 100%	er o		
6.	Check Unit 1 G GREATER THA	Generator frequency - AN 58.5 Hz.	~~ ~	IF Generator frequency de immediately recover above <u>THEN GO TO</u> Step 15 to so the grid.	oes not re 58.5 Hz, eparate from
		1			
		i. i			

	AP/1	MNS /A/5500/05 UNIT 1	GENERATOR VO	OLTAGE A DISTURBA	AND ELECTRIC GRID ANCES	PAGE NO. 4 of 27 Rev. 8
	7.	Monitor Gener follows:	ator Capability Curve as			
•	ļ	NOTE In the f KV, the	ollowing step, if Generator en assume voltage is less	⁻ voltage is than 24 K\	s fluctuating above and below V.	24
		_ a. Check Gene	erator voltage - LESS THA	N	a. Perform the following:	
		24100.			1) Monitor Generator Ca <u>PER</u> Enclosure 1 (Ge Capability Curve - 24	apability Curve enerator KV).
					2) GO TO Step 8.	
		_ b. Check OAC	- IN SERVICE.		b. Perform the following:	
					 Monitor Generator Ca <u>PER</u> Enclosure 2 (Ge Capability Curve - 22 	apability Curve enerator .8 KV).
					2) GO TO Step 8.	
		_ c. Monitor Ger <u>PER</u> OAC to	nerator Capability Curve urn on code "GENCAP".			
_	8.	Check Generat LIMITS OF GEI CURVE.	or MVARs - WITHIN NERATOR CAPABILITY		<u>GO TO</u> Step 11.	
-	_ 9.	IF AT ANY TIM exceeded, <u>THE</u> and 12.	<u>E</u> capability curve <u>N</u> perform Steps 11			
	_ 10	<u>GO TO</u> Step 13				

	MNS AP/1/A/5500/05 UNIT 1		GENERATOR VC D	OLTAGE A ISTURBA	ND ELECTRIC GRID NCES	PAGE NO. 5 of 27 Rev. 8
						100
	11.	Adjust MVARs curve by perfo following: Depress "LO ADJUST" to OR Depress "RA ADJUST" to	to within the capability orming one of the WER" on the "VOLTAGE reduce lagging MVARs ISE" on the "VOLTAGE reduce leading MVARs.			
	_ 12.	Check Genera LIMITS OF GE CURVE.	tor MVARs - WITHIN NERATOR CAPABILITY		 IF actions in Step 11 do not r MVARs, <u>THEN</u> perform the for a. <u>IF</u> voltage regulator in "AUT perform the following: 1) Place voltage regulator 2) Adjust MVARs to within capability curve. 	estore ollowing: FO", <u>THEN</u> in "MAN". the
					 b. <u>IF</u> unable to maintain MVAF curve, <u>THEN</u> remove generative as follows: 1) <u>IF</u> greater than P-8, <u>TH</u> the following: a) Trip reactor. b) <u>GO TO EP/1/A/5000 (Reactor Trip or Saf Injection).</u> 2) <u>IF</u> less than P-8, <u>THEN following:</u> a) Trip turbine. b) <u>GO TO AP/1/A/5500 (Turbine Generator).</u> 	Rs within rator from <u>EN</u> perform 0/E-0 rety perform the 0/02 Trip)
-						Ε.Υ.

	MNS AP/1/A/5500/05 UNIT 1	GENERATOR VO	OLTAGE A DISTURBA	ND ELECTRI NCES	IC GRID	PAGE NO. 6 of 27 Rev. 8
-						
	13. Monitor General a. Check general b. IF AT ANY abnormal Q abnormal Q abnormal Q abnormal Q c. GO TO Ste d. Place OAC Generator F range of 58 CAUTION If Q selection on immediately THEN GO TO Step 16 e. IF AT ANY goes below setpoint on immediately THEN GO To the grid. 14. GO TO Step 16	rator frequency as follow erator frequency - AT 60 Hz TIME generator frequency R TCC/SOC reports rid frequency condition, TO Step 13.d. p 16. point M1A0966 (U1 -requency) on trend with a .0 to 60.0 Hz. Senerator frequency goes parated from the grid with cur. TIME Generator frequency 58.5 Hz (LO LO alarm OAC) <u>AND</u> does not recover above 58.5 Hz, recover above 58.5 Hz, CO Step 15 to separate from	s: z. is below 58 hin 10 mir	a. <u>GO TO</u> S 3.5 Hz, the un outes or a Ge	Step 13.d.	íll
	 15. Separate from a. Notify SOC from the grid b. Ensure cond c. Check "TUP GREATER 	the grid as follows: that Unit 1 is separating d. trol rods in auto. RB IMP PRESS CH 2" - THAN 340 PSIG.		c. <u>GO TO</u> S	Step 15.k.	
-		For example of the second seco				

MNS AP/1/A/5500/ UNIT 1	05	GENERATOR VO	NERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES PAGE NO. 7 of 27 Rev. 8		PAGE NO. 7 of 27 Rev. 8	
15. (Contir	nued)					
d. Ch AV	eck Turb AILABLE	ine automatic control -		d. Pe 1)	erform the following: Ensure Turbine in "MAN control.	IUAL''
				2)	Immediately lower Turb less than 300 MW using LOWER''.	ine load to g ''GV
				3)	WHEN PCBs are opener separate from the Grid i <u>THEN</u> use "GV LOWER RAISE" to maintain 180	ed to n step 15.I, " and "GV 0 RPM.
				4)	<u>GO</u> <u>TO</u> Step 15.j.	
e. Ens AU	sure Turt TO".	bine control in "OPERATO	R			
f. Pla	ce "MW	LOOP" in service.				
g. Ent	er target	load of 300 MW.				
h. Ent	er load r	ate of 300 MW/MIN.				
i. Dep	oress "G	0".				
j. Do con	not conti iditions a	nue until the following re met:				
— "т	TURB IM THAN 34	IP PRESS CH 2"⊹ LESS↓ 0 PSIG				
F	P/R mete	rs - LESS THAN 60%.				
k. Not sep	tify Unit 2 parating f	2 Operator that Unit 1 is rom the Grid.				
I. Ope	en the fo	llowing Switchyard PCBs:				
1)	Open P(CB-8.				
2)	Open P(CB-9.				
3)	Open P(CB-11.				
4)	Open P(CB-12.				
m. <u>GO</u> Rej	<u>TO</u> AP/ [,] ection).	1/A/5500/03 (Load				

° 5

<u>SIM JPM F</u>

Appendix C	Page 2	Form ES-C-1	
	Job Performance Me		
Facility:	McGuire	Task No.:	
Task Title:	Restore Repaired Power Range Channel to Service	JPM No.:	<u>2010 Systems - Control</u> Room JPM F
K/A Reference:	015 A2.01 3.5/3.9		
Examinee:		Examiner:	
Facility Evaluator:		Date:	
Method of testing:			
Simulated Performa Classro	ance: oom SimulatorX	Actual Performa _ Plant	ance: 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:	 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.

Appendix C	Page 3 of 9	Form ES-C-1
	Job Performance Measure Workshee	t
Initiating Cue:	The CRS has directed you to restore Power Ra service in accordance with Step 21 of AP16 (M Instrumentation) Case III, "Power Range Malfu	nge Channel N43 to alfunction of Nuclear nction."
Time Critical Task:	NO	
Validation Time:	10 minutes	

Appendix C

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.

<u>OR</u>

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

Page 5 of 9 PERFORMANCE INFORMATION

(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.		

Page 6 of 9 PERFORMANCE INFORMATION

Form ES-C-1

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.		

Appendix C

Page 7 of 9 PERFORMANCE INFORMATION

Form ES-C-1

			1	
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.I) IF IAE tripped bistables PER Step 18, THEN perform the following: (Step 21.I.1) Instruct IAE to place the following bistables	The operator contacts IAE. Cue: IAE will return Bistables to service.		
	for failed channel back in service: • OPDT			
	OTDT			

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME:

Annon	div	\sim
Appen	uix	C

Page 8 of 9 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:

Appendix C	Form ES-C-1						
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."						
	Appendix C INITIAL CONDITIONS: INITIATING CUE:						

MNS AP/1/A/5500/16

MALFUNCTION OF NUCLEAR INSTRUMENTATION

UNIT 1

Case III Power Range Malfunction PAGE NO. 12 of 18 Rev. 12

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.

1.5.9.

C. Operator Actions



Place control rods in manual.

____2.

Check S/G levels - AT PROGRAMMED LEVEL.

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



Announce occurrence on paging system.

MNS AP/1/A/5500/16 UNIT 1	MALFUNCTION OF)F NUCLEAR INSTRUMENTATION P Case III /er Range Malfunction R	
ACTION/EXE	ECTED RESPONSE	RESPONSE NOT OBTAIN	IED
4. Check P/R char CHANNEL FAIL	inels - ONLY ONE ED.	 Perform the following: a. Initiate unit shutdown to Moone hour, as required by Termination and the state of the state	de 3 within ch Spec 10 (NRC uirements). cks are in ing plant locked b Blocked
 Secure any power 6. Check the follow REQUIRED STAPLANT CONDIT P-7 Lo Power P-7 Lo Power P-8 Hi Pwr Lo P-8 Hi Pwr Lo P-10 Nuclear at 7. Perform the follow "MISCELLANEC INDICATION PA A. Place the app BYPASS" sw position. b. Place the "PC BYPASS" sw position. 	er Increase in progress. ving interlocks - IN TE FOR EXISTING IONS: Rx Trips Blocked Flo Rx Trip Blocked It Power. Dwing actions at the US CONTROL AND NEL" drawer: Propriate "ROD STOP tch to the failed channel DWER MISMATCH tch to the failed channel	Notify IAE.	

MNS AP/1/A/5500/16 UNIT 1		MALFUNCTION OF	F NUCLEA Case r Range M	R INSTRUMENTATION	PAGE NO. 14 of 18 Rev. 12
ACTION/EXPECTED RESPONSE				RESPONSE NOT OBTAIL	NED
8. Perform the following actions at the Notify IAE. "DETECTOR CURRENT COMPARATOR" drawer:					
\checkmark	, a. Place the "L the failed ch	JPPER SECTION" switch t nannel position.	:0		
<u> </u>	b. Check the " for the uppe	CHANNEL DEFEAT" light er section - LIT.			
_	c. Place the "L , the failed ch	OWER SECTION" switch	to		
<u>/</u>	d. Check the " for the lowe	CHANNEL DEFEAT" light r section - LIT.			
9.	Perform the fo "COMPARATO	llowing actions at the R AND RATE" drawer:		Notify IAE.	
	a. Place the "C DEFEAT" sv position.	COMPARATOR CHANNEL witch to the failed channel			
_	b. Check the " light - LIT.	COMPARATOR DEFEAT"			
<u>NOTE</u> Removing fuses from power range drawers may cause associated NIS annunciators to alarm.					
10.	Trip bistables of follows:	of failed channel as			
	a. Remove Co "POWER R/ channel.	ntrol Power fuses from ANGE A" drawer for failed			
	b. <u>IF</u> Power Ra evidence of or abnormal Instrument F RANGE B" o	ange Cabinet shows damage (i.e. visual smoke smell), <u>THEN</u> remove Power fuses from "POWER drawer.	ł.		

	MNS AP/1/A/5500/16 UNIT 1 Power F			F NUCLEAR INSTRUMENTATION Case III er Range Malfunction		
м.	ACTION/EXPECTED RESPONSE			RESPONSE NOT OBTAIN	ED	
	11. Check the follo failed channel	owing status lights for the - LIT:	۱ <u> </u>	Notify IAE.		
	-V- "NUC OVER I(II,III,IV) BYF	POWER ROD STOP CH P" (1SI-19)				
	· "P/R HI FLU>	(LO STPT'' (1SI-2)				
	• "P/R HI FLU>	(HI STPT" (1SI-2)				
	🖌 • "P/R HI FLU>	(RATE" (1SI-3).				
	12. Check the follo	wing annunciator lights	N	lotify IAE.		
	• "P/R HI VOL" F-3)	ΓAGE FAILURE" (1AD-2,				
	• "P/R HI FLU> A-3)	(HI STPT ALERT" (1AD-2,				
1	✓ • "P/R HI FLU> A-1).	KRATE ALERIT" (1AD-2,				
	13. Check the follo 1SI-18 - LIT:	owing status lights on	F	Perform the following:		
	• "P/R LO SET BLOCKED"	POINT TRAIN A TRIP	a	alarm (1AD-2, A-2) - LIT.	「PT ALERT"	
	• "P/R LO SET BLOCKED".	POINT TRAIN B TRIP	b	 <u>IF</u> alarm is dark, <u>THEN</u> noti investigate. 	fy IAE to	
<u>-</u>	14. Check all CF c	ontrol valves - IN AUTO.	<u>V</u> a c	<u>VHEN</u> S/Gs at programmed I uto control desired, <u>THEN</u> p ontrol valve(s) in auto.	evel <u>AND</u> lace CF	
	15. Ensure operab record on NIS	le P/R channel selected to Recorder.	D			
	16. Adjust control T-Ref.	rods to maintain T-Avg at	t <u>II</u> a T	^E rods will not move in manແ djust turbine load to maintai ິ-Ref.	ual, <u>THEN</u> in T-Avg at	

AP/1/	MNS A/5500/16 J NIT 1	MALFUNCTION OF NUCLEAR INSTRUMENTATION Case III Power Range Malfunction		PAGE NO. 16 of 18 Rev. 12				
	ACTION/EXPECTED RESPONSE			RESPONSE NOT OBTAIN	ED			
<u> </u>	<u>WHEN</u> T-Avg w auto rod contro control rods to	vithin 1°F of T-Ref <u>, AND</u> ol desired, <u>THEN</u> return o auto.						
18.	Instruct IAE to associated wit 72 hours of fai (Tripping Inope Channels): • OPDT • OTDT.	trip the following bistab h failed P/R channel with lure <u>PER</u> IP/1/A/3090/014 erable Protection	les in					
19. <u>N</u>	IF AT ANY TIM repaired prior of THEN perform a. Inform IAE t required to b b. <u>GO TO</u> Step	E failed P/R channel is to IAE tripping bistables, the following: that bistables are no longer be tripped.	-					
20.	IF AT ANY TIM THEN check th for affected P/F • For P/R N-41 • "NC LOOP • "NC LOOP • For P/R N-42 • "NC LOOP • "NC LOOP • For P/R N-43 • "NC LOOP	E IAE completes Step 18 e following status lights R - LIT: A OPDT RX TRIP" (1SI-7 A OTDT RX TRIP" (1SI-7 B OPDT RX TRIP" (1SI-7 B OTDT RX TRIP" (1SI-7 C OPDT RX TRIP" (1SI-7 C OTDT RX TRIP" (1SI-7)).).).	Notify IAE.				
	 For P/R N-44: "NC LOOP "NC LOOP 	D OPDT RX TRIP" (1SI-7 D OTDT RX TRIP" (1SI-7)).					
	MNS AP/1/A/5500/16 UNIT 1		MALFUNCTION OF NUCLEAR INSTRUMENT Case III Power Range Malfunction		NSTRUMENTATION	PAGE NO. 17 of 18 Rev. 12		
--	---	---	--	---------	------------------------------	--	--------------	--
		ACTION/EX	PECTED RESPONSE			RESPONSE NOT OBTAIN	ED	
	21. <u>V</u> r	<u>VHEN</u> malfun epaired, <u>THE</u> I	ctioning P/R channel <u>N</u> perform the following:					
	a	. Ensure inst "POWER R	rument power fuses in ANGE B'' drawer installed.					
	 b. Install control power fuses in "POWER RANGE A" drawer. 			R				
	c	. Select "RES SWITCH".	SET" on the "RATE MODE					
	d. Check reactor power - GREATI THAN 25%.		tor power - GREATER		d.	Perform the following:		
						 Check the following bist DARK: 	able -	
			a A Tangan ang ang ang ang ang ang ang ang an			• "P/R HI FLUX LO ST	PT" (1SI-2).	
				<u></u>	2) IF bistable lit, THEN not	ify IAE.		
						3) GO TO Step 21.f.		
	e	. Check the f	ollowing bistable - LIT:		е.	Notify IAE.		
	_	_ • "P/R HI F	LUX LO STPT" (1SI-2).					
	f.	Check the f	ollowing bistables - DARK:		f.	Notify IAE.		
		_ • "P/R HI F	LUX HI STPT" (1SI-2)					
		_ • "P/R HI F	LUX RATE" (1SI-3).					
	g	. Place "CON DEFEAT" si	IPARATOR CHANNEL witch to "NORMAL".					
	h	. Place "POW switch to "O	/ER MISMATCH BYPASS' PERATE".	1				
	i.	Place "UPP "NORMAL".	ER SECTION" switch to					
	j.	Place "LOW "NORMAL".	ER SECTION" switch to					
	k.	. Place "ROD "OPERATE"	STOP BYPASS" switch to)				

. - 1 .

	MNS AP/1/A/5500/16 UNIT 1	MNS AP/1/A/5500/16MALFUNCTION OF NUCLEAR INSTRUMENTATION Case III Power Range Malfunction		PAGE NO. 18 of 18 Rev. 12	-		
	ACTION/EXPECTED RESPONSE RESPONSE NOT OBTA		NOT OBTAIN	ED			
	ACTION/EX 21. (Continued) I. IF IAE trippe THEN perfor 1) Instruct bistables service: 	PECTED RESPONSE ed bistables PER Step 18, rm the following: IAE to place the following s for failed channel back in AE has placed bistables service, THEN check the status lights for failed P/F /R N-41: C LOOP A OPDT RX TRIP I-7) C LOOP A OTDT RX TRIP I-7). C LOOP B OPDT RX TRIP I-7). C LOOP B OPDT RX TRIP I-7). C LOOP B OPDT RX TRIP I-7).	2 - "	2) Notify IAE.	NOT OBTAIN	ED	
	• "NC (1S	LOOP C OPDT RX TRIP I-7)	1				
	• "NC (1S	LOOP C OTDT RX TRIP I-7).	ı				
	• For P/	R N-44:					
anne a	• "NC (1S	LOOP D OPDT RX TRIP I-7)	1				
	• "NC (1S	LOOP D OTDT RX TRIP' I-7).	,				
			END				

<u>SIM JPM G</u>

2010 Systems - Control Room JPM G

NUREG 1021, Revision 9

Appendix C			Page 2 of 1	4	Form ES-C-1
		Job Perform	ance Meası	ure Workshee	t
Facility:	McGuire			Task No.:	
Task Title:	Isolate the During Turk	Circulating Wa	ater System Flooding	JPM No.:	<u>2010 Systems - Control</u> <u>Room JPM G</u>
K/A Reference:	075 A2.02	2.5/2.7			
Examinee:			E	xaminer:	
Facility Evaluator:			C	ate:	
Method of testing:					
Simulated Performa Classro	ance: oom	Simulator	A XP	ctual Perform lant	ance: <u>X</u>

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

Appendix C	Page 3 of 14	Form ES-C-1
	Job Performance Measure Worksheet	
Initiating Cue:	The CRS has directed you to isolate the RC System Enclosure 1 (Unit 1 Turbine Bldg Flooding) of AP/0/, Flooding), step 6.d, and completing all Step 6 substa continues with EP/1/A/5000/E-0 (Reactor Trip and/o	by continuing with A/5500/44 (Plant eps, while the crew r 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.

<u>OR</u>

- 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.

Page 5 of 14 PERFORMANCE INFORMATION

(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).		

Appendix C

Page 6 of 14 PERFORMANCE INFORMATION

OTEDO			T	
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.		
Continued NEXT PAGE	 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.		

STEPS

ELEMENTS

Page 7 of 14 PERFORMANCE INFORMATION

STANDARD

Form ES-C-1

COMMENTS

S/U

			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.	

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PERFORMANCE	INFORMATION

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) 	The operator depresses the 1RC-79 CLOSE pushbutton.		
	 1RC-80 (1B Main Condenser Discharge Gate) 	The operator depresses the 1RC-80 CLOSE pushbutton.		
	 1RC-81 (1C Main Condenser Discharge Gate) 	The operator depresses the 1RC-81 CLOSE pushbutton.		
10	(Step 6.I) 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

Page 9 of 14 PERFORMANCE INFORMATION

STANDARD

Form ES-C-1

COMMENTS REQUIRED

S/U

			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.	
	(2) 2 2 2 2 2 2 2 2		
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.	

Page 10 of 14 PERFORMANCE INFORMATION

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:	The operator contacts an NEO to take both actions.		
	Close 1RL-13 (1A LT Cooler Inlet Isol) (Unit 1 turbine bldg, 760+10, 1GG- 33 & 1F-33, north of MTOT room)	Booth CUE: As NEO, acknowledge.		
	Close 1RL-15 (1B LT Cooler Inlet Isol) (Unit 1 turbine bldg, 739+5 1G-33 & 1FF-33, bottom of stairway).	· ·		
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.		

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Page 11 of 14 PERFORMANCE INFORMATION

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.I.	The operator reads the Note and proceeds.		
	20 STEPS	STEPSELEMENTS19(Step 6.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)• 1RC-4 (1D RC Pump Disch Isol).20(Note prior to Step 6.t) Discharge gates can take up to 11 minutes to close from time recorded in Step 6.l.	STEPSELEMENTSSTANDARD19(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-3 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 19 (Step 6.s) Check the following RC Inlet valves - CLOSED: 1RC-1 (1A RC Pump Disch Isol) 1RC-2 (1B RC Pump Disch Isol) The operator observes OAC Graphic (RC PMPS) showing 1RC-1 as GREEN. 1RC-3 (1C 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-3 as GREEN. 20 (Note prior to Step 6.t) Discharge gates can take up to 11 minutes to close from time recorded in Step 6.1. 20 (Note prior to Step 6.t) Discharge dates can take up to 11 minutes to close from time recorded in Step 6.1.

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Form ES-C-1

RFORMANCE	INFORMATION

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) 	The operator observes the 1RC-79 Green and Red status light LIT.		
	 1RC-80 (1B Main Condenser Discharge Gate) 	The operator observes the 1RC-80 Green and Red status light LIT.		
	 1RC-81 (1C Main Condenser Discharge Gate). 	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:

Appendix	С
, ppondix	<u> </u>

Page 13 of 14 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:	
<u> </u>			



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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

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MNS AP/0/A/5500/44 UNIT 0		PL Enclos Unit 1 T	PLANT FLOODING Enclosure 1 - Page 1 of 17 Unit 1 Turbine Bldg Flooding		
	ACTION/EX	PECTED RESPONSE		RESPONSE NOT OBTAIN	ED
1.	Announce occ	currence over page.			
2.	<u>IF AT ANY TIM</u> reduced to a n <u>TO</u> Step 10.	I <u>E</u> flooding has been nanageable leak, <u>THEN G</u>	<u>0</u>		
<u>√</u> 3.	Dispatch oper status of flood Turbine Bldg F	ator to locally monitor l <u>PER</u> Enclosure 8 (Unit 1 ⁻ lood Monitoring).			
<u>/</u> 4.	Select source indicated step	of flooding and <u>GO TO</u> or enclosure:			
		SOURÇE		Step or Enclosure	
-	Massive Flood waterbox sect	ing on a single conden ion	ser	Step 5	
	Massive RC sys • More tha • RC pipir	stem flooding an one waterbox section ng	n	Step 6	-
	RC to Feedwate	er pump Condensers		Step 7	
	RC to Condensate Coolers			Step 8	
	CA Piping rupt	ture		Step 9	
-	RL piping to MTOT oil cooler			Enclosure 5 (Isolation of RC Crossover Header) Step 6	
	RC Crossover p • Shared • RC to RN • RL syste • RC to KN	oiping or components N Supply line em R Heat Exchangers		Enclosure 5 (Isolation of RC Crossover Header)	
	RF Piping			Enclosure 6 (Flooding from Fire Protection	

AP	MNS /0/A/5500/44 UNIT 0	PLANT FLOODING Enclosure 1 - Page 2 of 17 Unit 1 Turbine Bldg Flooding		PAGE NO. 6 of 293 Rev. 9		
	ACTION/EX	(PECTED RESPONSE			RESPONSE NOT OBTAIN	ED
5	 To isolate a si perform the form of the performance of the p	ngle waterbox section, bllowing: perator to check flood doors <u>R</u> Enclosure 10 (Flood	3			
	<u>NOTE</u> Water b. Close isola waterbox:	box Isolation valves take 1- tion valves on affected	2 minutes	to close	•	
	CAUTION	Isolating 1A1 waterbox	could affe	ect hotw	ell level indication.	tion valve
	a) Clo Cor	se 1RC-9 (1A1 Main ndenser Waterbox Inlet Isol).	1)	fails to close, <u>THEN</u> GC	<u>TO</u> Step 6.
	b) <u>WH</u> clos Cor Isol	IEN inlet valve closed, <u>THE</u> se 1RC-15 (1A1 Main ndenser Waterbox Outlet l).	<u>N</u>			
	2) For 1A a) Clo Cor	2 waterbox: se 1RC-10 (1A2 Main ndenser Waterbox Inlet Isol).	2)	<u>IF</u> either waterbox isola fails to close, <u>THEN</u> <u>GC</u>	tion valve <u>) TO</u> Step 6.
	b) <u>WF</u> clos Coi Iso	HEN INIET VAIVE Closed, <u>THE</u> se 1RC-16 (1A2 Main ndenser Waterbox Outlet I).	<u>:IN</u>			
	3) For 1B a) Clc Co	1 waterbox: ose 1RC-11 (1B1 Main ndenser Waterbox Inlet Iso	I).	3)	<u>IF</u> either waterbox isola fails to close, <u>THEN</u> <u>G</u>	tion valve <u>o TO</u> Step 6.
	b) <u>Wr</u> clo Co Iso	se 1RC-17 (1B1 Main ndenser Waterbox Outlet I).	<u>-11</u>			

MNS AP/0/A/5500/4 UNIT 0	14	PLANT FLOODING Enclosure 1 - Page 3 of 17 Unit 1 Turbine Bldg Flooding			PAGE NO. 7 of 293 Rev. 9	
AC	TION/EX	PECTED RESPONSE			RESPONSE NOT OBTAIN	ED
5. (Continu	ied)	t				
4)	For 1B2 a) Clos Con b) <u>WHI</u> clos Con Isol)	waterbox: e 1RC-12 (1B2 Main denser Waterbox Inlet Isol) <u>EN</u> inlet valve closed, <u>THE</u> e 1RC-18 (1B2 Main denser Waterbox Outlet). <u>N</u>	4)	<u>IF</u> either waterbox isolat fails to close, <u>THEN</u> <u>GO</u>	ion valve <u>TO</u> Step 6.
5)	For 1C1 a) Clos Con b) <u>WHI</u> clos Con Isol)	waterbox: e 1RC-13 (1C1 Main denser Waterbox Inlet Isol) <u>EN</u> inlet valve closed, <u>THE</u> e 1RC-19 (1C1 Main denser Waterbox Outlet). <u>N</u>	5)	<u>IF</u> either waterbox isolat fails to close, <u>THEN</u> <u>GO</u>	ion valve <u>TO</u> Step 6.
6) c. Rec ma	For 1C2 a) Clos Con b) <u>WHI</u> clos Con Isol) duce turk intain T-/	e waterbox: se 1RC-14 (1C2 Main denser Waterbox Inlet Isol) <u>EN</u> inlet valve closed, <u>THE</u> e 1RC-20 (1C2 Main denser Waterbox Outlet - bine load as necessary to Avg at T-Ref.). <u>N</u>	6)	<u>IF</u> either waterbox isolat fails to close, <u>THEN</u> <u>GO</u>	ion valve <u>TO</u> Step 6.
d. Che MA	eck flooc NAGEA	- ling - REDUCED TO A BLE LEAK.		d. Per 1) 2)	rform the following: IF flood still exists due to individual water box isol THEN GO TO Step 6. Reevaluate source of flo <u>RETURN TO</u> Step 4.	o failure of ation valve, poding and
e. <u>GO</u>	TO Ste	p 10.				

MNS AP/0/A/5500/44 UNIT 0			PLANT FLOODING Enclosure 1 - Page 4 of 17 Unit 1 Turbine Bldg Flooding			PAGE NO. 8 of 293 Rev. 9	
	ACTI	ON/E>	(PECTED RESPONSE			RESPÓNSE NOT OBTAIN	ED
 To isolate for massive RC system flooding in Unit 1 Turbine Building, perform the following: 							
v	a. Check HAS I	k Enc BEEN	losure 10 (Flood Doors) - I IMPLEMENTED.		<u>а</u> .	Dispatch operator to check closed <u>PER</u> Enclosure 10 (Doors).	flood doors Flood
(-	b. Dispa and c Disch baser	tch oj lose 1 Isol N nent,	perator to remove white tag IMXA - R8C (RC Crossove Motor (1RC-21)) (Unit 1 TB at 1B2 Feedwater Heater).	r			
1	c. Checl	k Unit	1 reactor - TRIPPED.		C.	Perform the following:	÷
						1) Trip Unit 1 reactor.	
						2) Have another operator this AP.	continue with
-						3) <u>GO TO</u> EP/1/A/5000/E- Trip or Safety Injection)	-0 (Reactor
_	_ d. Open BREA	Main \KER	condenser "VACUUM ".				
	e. Stop	all Un	it 1 RC pumps:				
	• 1A	RC p	ump				
	• 1B	RC p	ump				
	• 1C	RC p	pump				
	_ • 1D	RC p	pump.				

	MNS AP/0/A/5500/44 UNIT 0	PL Enclos Unit 1 T	PLANT FLOODING Enclosure 1 - Page 5 of 17 Unit 1 Turbine Bldg Flooding			PAGE NO. 9 of 293 Rev. 9
	ACTION/EX	PECTED RESPONSE			RESPONSE NOT OBTAIN	ED
	6. (Continued) f. Press close valves: 	pushbutton on the followin A1 Main Condenser Inlet Isol) A2 Main Condenser Inlet Isol) B1 Main Condenser	ıg			
	- • 1RC-12 (Waterbox - • 1RC-13 (Waterbox - • 1RC-14 (Waterbox NOTE RC cro	A Inlet Isol) A Inlet Isol) A Inlet Isol) A Inlet Isol) A Inlet Isol) A Inlet Isol). A Inlet Isol).	ge valve ir	ndica	ations are on Unit 1 OAC (R	с
	g. Check 1RC U2 RC Disc	-22 (U1 RC Crossover To h Isol) - OPEN.		_ g.	<u>GO</u> <u>TO</u> Step 4 of Enclosure of RC Crossover Header) to entire RC Crossover Heade	e 5 (Isolation o isolate er.
	h. Check 1RC RC Supply	-7 (U1 RC Crossover To U Isol) - OPEN.	2	h. 	 Perform the following: 1) Open 1RC-7. 2) <u>IF</u> 1RC-7 will not open, <u>TO</u> Step 4 of Enclosure of RC Crossover Header isolate entire RC Cross Header. 	<u>THEN</u> <u>GO</u> 5 (Isolation er) to over
and the second se	i. Press close RC Crossov j. <u>WHEN</u> brea <u>THEN</u> press 1RC-21 (U1	pushbutton for 1RC-5 (U1 ver Supply Isol). aker for 1RC-21 is closed, s close pushbutton for I RC Crossover Disch Isol)				

MNS AP/0/A/5500/44 UNIT 0	PL Enclos Unit 1 1	ANT FLO sure 1 - Pa f urbine B	ODING age 6 of 17 I dg Flooding	PAGE NC 10 of 293 Rev. 9). 3
ACTION/EX	PECTED RESPONSE		RESPONSE NOT OBTA	INED]
6. (Continued)					
k. Press close following Ur	pushbutton on the nit 1 RC discharge gates:			•	
• 1RC-79 (Discharge	1A Main Condenser e Gate)				
• 1RC-80 (Discharge	1B Main Condenser e Gate)				
• 1RC-81 (Discharge	1C Main Condenser e Gate).				
I. Record time					
NOTE Waterb m. Close water - • WHEN 11 1RC-15 (Waterbox - • WHEN 11 close 1R Waterbox - • WHEN 1 close 1R Waterbox	 box isolation valves take 1- box outlet valves as follow RC-9 is closed, <u>THEN</u> close 1A1 Main Condenser Auther Isol). RC-10 is closed, <u>THEN</u> C-16 (1A2 Main Condenses Cutlet Isol). RC-11 is closed, <u>THEN</u> C-17 (1B1 Main Condenses Cutlet Isol). RC-12 is closed, <u>THEN</u> C-18 (1B2 Main Condenses Cutlet Isol). RC-13 is closed, <u>THEN</u> C-19 (1C1 Main Condenses Cutlet Isol). RC-14 is closed, <u>THEN</u> C-20 (1C2 Main Condenses Cutlet Isol). 	-2 minutes /s: ee er er er er	e to close.		
Waterbo	x Outlet Isol).				

MNS AP/0/A/550 UNIT	0/44 0	PL Enclos Unit 1 T	ANT FLO sure 1 - Pa urbine Bl	ODI Ige 1 dg I	NG 7 of 17 Flooding	PAGE NO. 11 of 293 Rev. 9	
,	ACTION/EX	PECTED RESPONSE			RESPONSE NOT OBTAIN	ED	
6. (Conti	nued)						
n. C ls	Check 1RC- sol) - CLOS	-5 (U1 RC Crossover Supp ED.	ly	n.	Dispatch operator to close 7 RC Crossover Supply Isol) turbine bldg, 737, 1C-25 & of 1C2 waterbox inlet in pit)	1RC-5 (U1 (Unit 1 1C-26, west	
0. C	Check 1RC sol) - CLOS	21 (U1 RC Crossover Disc ED.	ch	0.	 Perform the following: Contact security to prov to Alarm Door 3230. Dispatch operator to uniclose 1RC-21 (U1 RC C Disch Isol) (Unit 1 turbin 739'1J-31, bunker betwee 1C2 feedwater heaters) 	ide access lock and crossover ne bidg, een 1A2 and	
p. P C	Place 1RL-1 Control) in n	8 (Unit 1 LT Coolers nanual and close.					
q. D fo	Dispatch op ollowing:	erator to perform the					
_•	Close 1R Isol) (Unit 1GG-33 & room)	L-13 (1A LT Cooler Inlet 1 turbine bldg, 760+10, 4 1F-33, north of MTOT					
_•	Close 1R Isol) (Unit 1G-33 & stairway).	L-15 (1B LT Cooler Inlet 1 turbine bldg, 739+5 1FF-33, bottom of					
r. C s	Check Unwa SERVICE.	atering pump - OUT OF		r.	Contact station managemener evaluate securing Unwatering	nt to ng pump.	

MNS AP/0/A/5500/44 UNIT 0	PL Enclos Unit 1 T	ANT FLO sure 1 - Pa f urbine Bl	ODING age 8 of dg Flo o	17 oding	PAGE NO 12 of 293 Rev. 9	
ACTION/EX	PECTED RESPONSE			RESPONSE NOT OBTAIN	ED	
ACTION/EX6. (Continued)NOTERC pu shoulds. Check the f CLOSED:	mp discharge valve indication automatically close when the following RC Inlet valves - A RC Pump Disch Isol) B RC Pump Disch Isol) C RC Pump Disch Isol) D RC Pump Disch Isol) D RC Pump Disch Isol).	ions are or their respe 1 minutes	n RCPN ective R s. Dis va to close t. Pe 1)	RESPONSE NOT OBTAIN APS graphic. These value C pump is stopped. spatch operator to close a lve(s). e from time recorded in erform the following: Do not continue until dis	ED ves affected scharge	
 1RC-79 (Discharg) 1RC-80 (Discharg) 1RC-81 (Discharg) 1RC-81 (Discharg) 	(1A Main Condenser le Gate) (1B Main Condenser le Gate) (1C Main Condenser le Gate).		2)	 gates have had a chance close. IF any discharge gate w THEN perform the follow Contact Security (268 them meet operator a area gate 27 (intake and escort them thro Zone and out gate 31 structure). Dispatch operator to security at protected (intake structure) and RC Discharge Gates 	te to fully vill not close, wing: 38) and have at protected structure) ugh the I (discharge meet area gate 27 I close Unit 7	· · · · · · · · · · · · · · · · · · ·
u. Check floo MANAGEA	AING - KEDUCED TO A ABLE LEAK.		_ u. Re <u>R</u> I	EEValuate source of flood ETURN TO Step 4.	ing anu	1

v. <u>GO TO</u> Step 10.

Step 10.

<u>SIM JPM H</u>

2010 Systems - Control Room JPM H

NUREG 1021, Revision 9

Annual Control of Cont			
Appendix C	Page 2 d	of 15	Form ES-C-1
	Job Performance Me	asure Worksheet	
Facility:	McGuire	Task No.:	
Task Title:	Remove Pressurizer Heaters from	<u>n</u> JPM No.:	2010 Systems - Control
	Service		<u>Room JPM H</u>
K/A Reference	010 44 02 3 6/3 4		
	010, 74.02, 0.0/0.4		
Examinee:		NRC Examiner:	
Facility Evaluator:		Date:	
Method of testing:			
Simulated Performa	ance:	Actual Performa	ance: X
Classro	oom SimulatorX	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)

Appendix C	Page 3 of 15	Form ES-C-1
	Job Performance Measure Worksheet	
Initiating Cue:	The CRS has directed you to remove Pzr Heater Grou from service per Enclosure 4.6 (Operation of Pzr Heat OP/1/A/6100/003, and ensure that NC System pressu controlled normally at 2235 psig.	ups A, B and D ters) of ire is being
	All outstanding R&Rs that may impact performance of have been evaluated.	Enclosure 4.6
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

<u>OR</u>

- 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 Sim	nulator in FREEZE until opera	tor is rea	ady 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.		

Page 6 of 15 PERFORMANCE INFORMATION

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.		

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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.		

Appendix C

Page 8 of 15 PERFORMANCE INFORMATION

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.		

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Form ES-C-1

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).		

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Form ES-C-1

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	Using the NC-Pressurizer and PRT DCS Screen, the operator adjusts until Pzr Press Master output (DOWN) until the error signal is < 15 psig.		
	1NC-27C (A Loop Pzr Spray Control) Closes 1NC-29C (B Loop Pzr Spray Control) Closes	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.

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Page 11 of 15 PERFORMANCE INFORMATION

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.		
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Form ES-C-1

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.		

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Form ES-C-1

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.	The operator reads the Caution, and proceeds.		
	(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:	The operator rotates either the A, B or D Pzr Htr Mode		
	A Pzr Htr Mode Select B Pzr Htr Mode Select	Select Switch clockwise to MAN.		
	D Pzr Htr Mode Select			
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:

Appendix C

Page 14 of 15 VERIFICATION OF COMPLETION

Job Performance Measure No.:	<u>2010 Systems -</u>	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:



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

Operation of Pzr Heaters

1. Limits and Precautions

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

2. Initial Conditions

None

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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
 - \Box 3.3.1.3 Monitor Pzr pressure for 2 minutes.

Operation of Pzr Heaters

- □ 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
- \square 3.3.2.3 Monitor Pzr pressure for 2 minutes.
 - 3.3.2.4 Ensure second Pzr Htr Mode Select in "MAN":
 - \Box 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

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Monitor Pzr pressure for 2 minutes.

Enclosure 4.6

Operation of Pzr Heaters

- □ 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
 - \square 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
- \square 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
- \square 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.

Operation of Pzr Heaters

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 <u>AND</u> 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
 - \Box 3.4.2.3 Monitor Pzr pressure for 2 minutes.

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Operation of Pzr Heaters

- ☐ 3.4.3 <u>IF</u> three Pzr Htr Groups in service <u>AND</u> 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 GroupB Pzr Htr Group
- D Pzr Htr Group
- \Box 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
- \square 3.4.3.6 Monitor Pzr pressure for 2 minutes.

Enclosure 4.6

OP/**1**/A/6100/003 Page 6 of 11

Operation of Pzr Heaters

- ☐ 3.4.4 IF three Pzr Htr Groups in service <u>AND</u> 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
- \Box 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
- \Box 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 Pre unavailable and assessment sho 3.4.	ss Master in l should be o uld be perfo 4.9 <u>IF</u> of To 4.10 On the □ A.	a manual makes automatic operation of evaluated using Electronic Risk Assess ormed prior to placing Pzr Press Master time allows <u>AND</u> Unit 1 in Modes 1- 1NC-34A (Pzr PORV) using Electron ol. the DCS Work Station, Pressurizer a following: Place "PZR PRESS MASTER" in m	of 1NC-34A (Pzr PORV) ssment Tool. This er in manual. 4, evaluate unavailablilty ic Risk Assessment nd PRT graphic, perform
	□ 3.4. □ 3.4.	4.9 <u>IF</u> of To 4.10 On the □ A.	time allows <u>AND</u> Unit 1 in Modes 1- 1NC-34A (Pzr PORV) using Electron ol. the DCS Work Station, Pressurizer a following: Place "PZR PRESS MASTER" in m	4, evaluate unavailablilty ic Risk Assessment nd PRT graphic, perform
	□ 3.4.	4.10 On the □ A.	the DCS Work Station, Pressurizer a following: Place "PZR PRESS MASTER" in m	nd PRT graphic, perform
		□ A.	Place "PZR PRESS MASTER" in m	
				nanual.
		□ B.	Adjust "PZR PRESS MASTER" ou occurs:	tput until the following
			 C Pzr Htr Group begins cycling 1NC-27C (A Loop Pzr Spray Co 1NC-29C (B Loop Pzr Spray Co 	ontrol) closes ontrol) closes
		□ C.	Place "PZR PRESS MASTER" in a	uto.
	□ 3.4.	4.11 Mo	onitor Pzr pressure for 2 minutes.	
	3.4.5 <u>IF</u> t Gro	wo Pzr Htr up in servic	Groups in service <u>AND</u> desire to oper e, perform the following:	ate with one Pzr Htr
	3.4.	5.1 Pla	ce 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 Ch	eck associated Pzr Htr Group in "OFF	2".
			A Pzr Htr Group B Pzr Htr Group D Pzr Htr Group	
	□ 3.4.	5.3 Mo	onitor Pzr pressure for 2 minutes.	

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			Enclosure 4.6	OP/ 1 /A/6100/003
			Operation of Pzr Heaters	Page 8 of 11
E] 3.4.6	IF two Pzr I from service	Htr Groups in service <u>AND</u> desire to remove, perform the following:	ve all Pzr Htr Groups
		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	5.4 - 3.4.6.7C	should be performed without delay.	

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- □ 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

		Enclosure 4.6 Operation of Pzr Heaters	OP/ 1 /A/6100/003 Page 9 of 11
NOTE:	Placing Pzr Press M unavailable and shou assessment should b	aster in manual makes automatic operat uld be evaluated using Electronic Risk A e performed prior to placing Pzr Press M	ion of 1NC-34A (Pzr PORV) Assessment Tool. This Master in manual.
	□ 3.4.6.6	<u>IF</u> time allows <u>AND</u> Unit 1 in Mode of 1NC-34A (Pzr PORV) using Elec Tool.	es 1-4, evaluate unavailablilt ctronic Risk Assessment
	□ 3.4.6.7	On the DCS Work Station, Pressurize the following:	zer and PRT graphic, perform
		□ A. Place "PZR PRESS MASTER"	in manual.
		□ B. Adjust "PZR PRESS MASTER occurs:	" output until the following
		 C Pzr Htr Group begins cyc 1NC-27C (A Loop Pzr Spra 1NC-29C (B Loop Pzr Spra 	eling ay Control) closes ay Control) closes
		□ C. Place "PZR PRESS MASTER"	in auto.
	□ 3.4.6.8	Monitor Pzr pressure for 2 minutes.	
[□ 3.4.7 <u>IF</u> one P	zr Htr Group in service, perform the fol	lowing:
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 	

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- Check associated Pzr Htr Group in "OFF": 3.4.7.2

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

		C	Enclosure 4.6 Operation of Pzr Heaters	OP/ 1 /A/6100/003 Page 10 of 11
NOTE:	Placing Pzr Press M unavailable and sho assessment should b	ess Master in manual makes automatic operation of 1NC-34A (Pzr PORV) Id should be evaluated using Electronic Risk Assessment Tool. This ould be performed prior to placing Pzr Press Master in manual.		
	□ 3.4.7.3	<u>IF</u> of I Too	time allows <u>AND</u> Unit 1 in Modes INC-34A (Pzr PORV) using Electr bl.	s 1-4, evaluate unavailablilty ronic Risk Assessment
	□ 3.4.7.4	On the	the DCS Work Station, Pressurize following:	er and PRT graphic, perform
		□ A.	Place "PZR PRESS MASTER" in	n manual.
		□ B.	Adjust "PZR PRESS MASTER" occurs:	output until the following
			 C Pzr Htr Group begins cyclic 1NC-27C (A Loop Pzr Spray 1NC-29C (B Loop Pzr Spray 	ng Control) closes Control) closes
		□ C.	Place "PZR PRESS MASTER" in	n auto.
	□ 3.4.7.5	Мо	nitor Pzr pressure for 2 minutes.	

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Operation of Pzr Heaters Placing C Pzr Heater Group In Service

3.5

□ 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

2010 Systems - In-Plant JPM I

NUREG 1021, Revision 9

Appendix C	Page 2	of 10	Form ES-C-1			
	Job Performance Me	asure Worksheet				
Facility:	McGuire	Task No.:				
Task Title:	Control Steam Pressure Locally Using SM PORVs	JPM No.: <u>2010</u> Plant	<u>Systems – In-</u> JPM I			
K/A Reference:	039 A4.07 (2.8/2.9)					
Examinee:		NRC Examiner:				
Facility Evaluator:		Date:				
Method of testing:						
Simulated Perform	ance: X	Actual Performance:				
Classr	oom 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 (Lo 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 CR The CRS desires to reduce pressure below the Safety Valve lif of 1170 psig.		2/1/A/5500/17 (Loss of nt action step 17. in step 17, the RO orts this to the CRS. he Safety Valve lift setpoint
Task Standard:	The operator will open 1SV-1 and 1SV-19 to position from the Unit 1 exterior doghouse.	10% open and control their
Required Materials:	PPE (Hardhat, Safety Glasses, Hearing Prote	ection, Safety Shoes etc.)
General References:	AP/1/A/5500/17 (Loss of Control Room)	
Handouts:	AP/1/A/5500/17 (Loss of Control Room), Encl of PORVs)	losure 7 (Manual Operation
Initiating Cue:	The CRS dispatches you to locally control Ste with the SM PORV's per AP/1/A/5500/17 (Los Enclosure 7 (Manual Operation of PORVs).	eam Generator Pressure ss of Control Room)
2010 Systems – In-Pla	ant JPM I	NUREG 1021, Revision 9

Appendix C

Page 3 of 10 Job Performance Measure Worksheet

Time Critical Task: NO

Validation Time: 10 minutes

NOTE: If the installed O₂ monitors in the Doghouses are out of service, operators are expected to use portable O₂ 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 O₂ monitors must be used during performance of this JPM, the time to obtain and operate the O₂ monitor may be subtracted from the Actual JPM Completion Time.

Page 4 of 10 PERFORMANCE INFORMATION

(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.		

Page 5 of 10 PERFORMANCE INFORMATION

Form ES-C-1

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:	The operator rotates 1SV-19 and 1SV-1 controller knobs completely counterclockwise.		
	Manual loader 1SMML5521 (1A SM PORV (1SV-19) Local Manual Loader)	Cue: Control knob rotated counterclockwise.		
	Manual loader 1SMML5491 (1D SM PORV (1SV-1) Local Manual Loader)	Cue: Control knob rotated counterclockwise.		

Appendix C

STEPS

ELEMENTS

Page 6 of 10 PERFORMANCE INFORMATION

STANDARD

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) D-2 (1D S/G C/R MANUAL	The operator rotates the A-2 and D-2 C/R Manual Loader Output Isolation Valves fully clockwise. Cue: Knob rotated clockwise.	
	LOADER OUTPUT ISOL)	Cue: Knob rotated clockwise.	

Form

S/U

Page 7 of 10 PERFORMANCE INFORMATION

Form ES-C-1

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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%.		

Page 8 of 10 PERFORMANCE INFORMATION

Form ES-C-1

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.

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STOP TIME:

2010 Systems – In-Plant JPM I

Appendix C	lix C	nd	ре	р	A
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Page 9 of 10 VERIFICATION OF COMPLETION

Form ES-C-1

Job Performance Measure No.:	<u> 2010 Systems –</u>	In-Plant JPM	Ш
Examinee's Name:			
Date Performed:			
Facility Evaluator:			
Number of Attempts:			
Time to Complete:			
Question Documentation:	,		
Result: S	SAT	UNSAT	
Examiner's Signature:			Date:



Appendix C	Form ES-C-1
	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.

AI	P/1/ U	MNS LOSS OF /1/A/5500/17 Enclosu UNIT 1 Manual C			ROL ROOM age 1 of 2 on of PORVs	PAGE NO. 34 of 41 Rev. 23
	1.	Establish com doghouses to Panel.	munication from SRO at Aux Shutdown			
<u>N</u>	ΙΟΤ	E A Main Ste manual loa	am Isolation signal or loss iders.	of VI will	prevent operation of PORVs fron	n
	2.	Operate valves Steam Line PO Main Steam Line doghouse) usi follows: a. Ensure the fare in the fuposition: Manual log PORV (13) Loader) Manual log PORV (13) Loader) Manual log PORV (13) Loader) Manual log PORV (13) b. Ensure the fare A-1 (1A S) Input Isol) c. D-1 (1D S) Input Isol) c. CLOSE the A-2 (1A S) Output Iso Output Iso	a 1SV-19AB (1A Main PRV) and 1SV-1AB (1D ne PORV) (exterior ing manual loaders as following controller knobs il counter clockwise ader 1SMML5521 (1A SM SV-19) Local Manual ader 1SMML5491 (1D SM SV-19) Local Manual loader following valves are OPEN /G Local Manual Loader following valves: /G C/R Manual Loader of C/R Manual Loader	 	Operate the following valves instruction tag near valves: 1SV-19AB (1A Main Steam L 1SV-1AB (1D Main Steam Li	PER .ine PORV) ne PORV).

MNS AP/1/A/5500/17

UNIT 1

LOSS OF CONTROL ROOM

Enclosure 7 - Page 2 of 2 Manual Operation of PORVs

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2	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

Page 2 of 9
Job Performance Measure Worksheet

Facility:	McGuire		Task No.:	
Task Title:	<u>Makeup to the</u> <u>Tanks</u>	e Unit 1 KC Surge	JPM No.:	<u>2010 Systems – In-</u> Plant JPM J
K/A Reference:	008, A2.02, 3	.2/3.5		
Examinee:			NRC Examine	r:
Facility Evaluator:			Date:	
Method of testing:				
Simulated Performance: X Actual Performance:				
Classro	oom	Simulator	Plant X	

READ TO THE EXAMINEE

Appendix C

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)			

A	D0.10	
Appendix C	Page 3 of 9	Form ES-C-1
	Job Performance Measure Worksheet	
	PT/0/A/4600/113 (Operator Time Critical Task verifica 13.17 (Initiating Makeup to the KC Surge Tank or Isola Leak)	tion) Enclosure ate KC Header
Handouts:	AP/1/A/5500/21 (Loss of KC or KC System Leakage), (Aligning RN Makeup to KC Surge Tank)	Enclosure 3
Initiating Cue: The CRS directs you to align makeup to both Unit 1 KC S AP/1/A/5500/21 (Loss of KC or KC System Leakage), En (Aligning RN Makeup to KC Surge Tank).		C Surge Tanks <u>per</u> Enclosure 3
	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 E	Entry Point.

2010 Systems – In-Plant JPM J

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Page 4 of 9 PERFORMANCE INFORMATION

(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:	The operator recognizes that the 1A RN Pump is ON (Initial Condition).		
	(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.			

2010 Systems - In-Plant JPM J

Page 5 of 9 PERFORMANCE INFORMATION

Form ES-C-1

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(Step 1.a.2) Dispatch operator to perform the following:	The operator removes the lock on 1KC-494.		
	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)	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-	The operator rotates the 1KC-496 handwheel in the counter-clockwise direction.		
	KC Pump).	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:	The operator recognizes that the 1B RN Pump is ON (Initial Condition).		
	(Step 1.b.1) Ensure 1B RN Pump is on.			

STEPS

ELEMENTS

Page 6 of 9 PERFORMANCE INFORMATION

STANDARD

Form ES-C-1

COMMENTS REQUIRED FOR UNSAT

S/U

*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) 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)	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. Cue: The handwheel rotates, the Stem rises out of the valve and then stops. Cue: The handwheel rotates, the Stem rises out of the valve and then stops.	
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.	

Page 7 of 9 PERFORMANCE INFORMATION

Form ES-C-1

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:
Append	ix	С
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Page 8 of 9 VERIFICATION OF COMPLETION

Job Performance Measure No.:	<u> 2010 Systems –</u>	In-Plant JPN	<u>1 J</u>
Examinee's Name:			
Date Performed:			
Facility Evaluator:			
Number of Attempts:			
Time to Complete:			
Question Documentation:			
Result:	SAT	UNSAT	
Eveniner's Signeture			Data
	· · · · · · · · · · · · · · · · · · ·		

Appendix	С
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Form ES-C-1

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 <u>per</u> 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.

NUREG 1021, Revision 9

UNIT 1

LOSS OF KC OR KC SYSTEM LEAKAGE

Enclosure 3 - Page 1 of 2 Aligning RN Makeup to KC Surge Tank PAGE NO. 32 of 78 Rev. 9

ACTION	/EXPECTED	RESPONSE
TICTTON		

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. Align one or both of the following 1. 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. 1) GO TO Step 1.b. 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). end . 4

	MNSLOSS OF KC OR KC SYAP/1/A/5500/21Enclosure 3 - PaUNIT 1Aligning RN Makeup to		MNS AP/1/A/5500/21LOSS OF KC OR KC SYSTEM LEAKAGE Enclosure 3 - Page 2 of 2UNIT 1Aligning RN Makeup to KC Surge Tank		PAGE NO. 33 of 78 Rev. 9	
-	ACTION/EX	XPECTED RESPONSE		RESPONSE NOT OBT	AINED	
	1. (Continued)	rain to 18 KC Surgo Tonk				
	makeup is o	desired, <u>THEN</u> :				
	1) Ensure	1B RN pump is on.		1) Perform the following	ig:	
				a) <u>IF</u> makeup using desired, <u>THEN I</u> Step 1.a.	g A train RN is RETURN <u>TO</u>	
				b) GO TO Step 2.		
	2) Dispatc following	h operator to perform the g:				
	• Unloc RN A Surge (aux corne	ck and open 1KC-497 (Unit 1 ssured Supply to 1B KC e Tank Compartment Isol) bldg, 733+10, HH-56, in er west of 1B1 KC Pump).				
	• Oper Tank Supp HH-5 Pump	n 1KC-499 (1B KC Surge Compartment RN Assured ly Isol) (aux bldg, 733+10, 6, in corner west of 1B1 KC b).				
	2. <u>IF AT ANY TIN</u> dispatch opera trains RN to K Step 1.	<u>IE</u> an RN pump trips <u>, THEN</u> ator to isolate affected C makeup line opened in				
	3. Adjust makeu prevent overfl (approximatel)	p rate as required to ow of KC Surge Tank y 8.5 ft).				

In-Plant JPM K

2010 Systems - In-Plant JPM K

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Appendix C	Page	2 of 15 Form ES-C-
	Job Performance	Measure Worksheet
Facility:	McGuire	Task No.:
Task Title:	Restore Power to KXB Power	Panel JPM No.: <u>2010 Systems – In-</u>
	Board Using Inverter SKX	<u>Plant JPM K</u>
K/A Reference [.]	APE 057 AA1 01 37/37	
Examinee:		NRC Examiner:
Facility Evaluator:		Date:
Method of testing:		
Simulated Perform	ance: X	Actual Performance:
Classro	oom 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

2010 Systems – In-Plant JPM K

Appendix C	Page 3 of 15	Form ES-C-1
	Job Performance Measure Worksheet	
Validation Time:	24 minutes	
NOTE:	Just prior to administering JPM, ensure Key for Key Static Inverter Alarm Circuit Switch is located in the	/-Operated KXB

Page 4 of 15 PERFORMANCE INFORMATION

(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.		

Appendix C

Page 5 of 15 PERFORMANCE INFORMATION

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.		

Page 6 of 15 PERFORMANCE INFORMATION

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

Appendix C

Page 7 of 15 PERFORMANCE INFORMATION

Form ES-C-1

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.		
		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.		

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STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	(Step 3.h) On SKX Static Inverter, perform the following:	The operator observes SKX Inv Bkr 2.		
	(Step 3.h.1) Ensure Kirk key installed in SKX Inv Bkr 2 (DCB to SKX DC Supply)	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.		
*40				
	(Step 3.n.3) WHEN "PRECHARGE" light has been	Cue:		
	lit for 10 seconds, THEN perform the following in rapid succession:	The light has been LIT for 10 seconds.		
	(Step 3.h.3.a) Release "PRECHARGE" switch	The operator releases the Switch.		
	(Step 3.h.3.b) Close SKX Inv Bkr 2 (DCB to SKX DC	The operator moves breaker to the UP position.		
	Supply)	Cue:		
		The breaker moved into the up position.		
		;		

Appendix C

Page 9 of 15 PERFORMANCE INFORMATION

Form ES-C-1

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED
				FOR UNSAT
14	(Step 3.h.4) Check the following indications:	The operator observes the Inverter Output Voltage.		
	INVERTER OUTPUT VOLTAGE – 116 -124 VOLTS	Cue:		
	INVERTER OUTPUT FREQUENCY – 59.7-60.3 HZ	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.		
		i.		

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2010 Systems – In-Plant JPM K

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Page 10 of 15 PERFORMANCE INFORMATION

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.		

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Page 11 of 15 PERFORMANCE INFORMATION

STEP	S 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:	The operator observes the System Output Voltage.		
		Cue:		
	VOLTAGE - 116 - 124 VOLTS	Meter indicates 120		
	SYSTEM OUTPUT FREQUENCY – 59.7-60.3 HZ	volts.		
	SYSTEM OUTPUT CURRENT – LESS THAN 292 AMPS	The operator observes the System Output Frequency.		
		Cue:		
		Meter indicates 60 Hz.		
		The operator observes the System Output Current.		
		Cue:		
		Meter indicates 150 amps.		

Appendix C

Page 12 of 15 PERFORMANCE INFORMATION

1	07500				
	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 <u>KXB</u> Static	The operator observes the		
		Inverter, ensure "ALARM CIRCUIT" is "OFF".	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.		

Appendix (С
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Page 13 of 15 PERFORMANCE INFORMATION

Form ES-C-1

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
22	(Step 3.I) 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:

Appendix	С
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Page 14 of 15 VERIFICATION OF COMPLETION

Form ES-C-1

Job Performance Measure No.:	<u>2010 Systems – In-Plant JPM K</u>
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Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result:

SAT

UNSAT

Examiner's Signature:	Date:	



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	Appendix C	Form ES-C-1
		JPM CUE SHEET
Ż		
	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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MNS AP/1/A/5500/15 UNIT 1		LOSS OF VITAL OR AUX CONTROL POWER Enclosure 24 - Page 1 of 31 Restoring Power To KXB		CONTROL POWER age 1 of 31 er To KXB	PAGE NO. 215 of 279 Rev. 21
: <u>CAU</u>	<u>TION</u> □ Visil □ One pow shot □ Whe in fr	bly damaged breakers sh attempt at closing a "TR er to KXB. If a tripped b uld investigate prior to fu en closing a tripped break ont of the breaker cubicl	all not be IPPED" b preaker re irther ope ker, the oj e.	e operated without IAE approva reaker is allowed when restori -opens after being closed, IAE ration of the breaker. perator should not stand direc	al. ng tly
1.	 IF AT ANY TIM this enclosure closed, <u>THEN</u> a. Notify IAE to breaker tripp b. Have station whether plan continuation completion of 	E during performance of a breaker trips after beir perform the following: o investigate cause of bing. a management evaluate of conditions warrant of this enclosure prior to of IAE's investigation.	ig		
2.	 Select method panelboard: To energize + TO Step 3. To energize + TO Step 4. To energize + KXB Inverter Step 5. To energize + SKX Inverter Step 7. 	of restoring power to KX (XB using SKX Inverter, G (XB using KXB Inverter, G (XB from MKB through the Bypass Panel, GO TO (XB from MKB through the Bypass Panel, GO TO	(В) О О		

UNIT 1

LOSS OF VITAL OR AUX CONTROL POWER

Enclosure 24 - Page 2 of 31 Restoring Power To KXB

3. Align SKX Inverter to KXB panelboard as follows: a. On SKX Breaker Alignment Panel, a. Perform the following: check the following breakers - OPEN: 1) Notify Control Room to evaluate □ SKX BAP Bkr 1 (SKX AC Output to swapping bus aligned to SKX to KXA) another source. □ SKX BAP Bkr 2 (SKX AC Output to 2) IF bus aligned to SKX cannot be 1KU) swapped to another source, THEN RETURN TO Step 2. SKX BAP Bkr 4 (SKX AC Output to 2KU). 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. 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: __ D Ensure SKX Byp Pnl Bkr 4 (MKA Alt AC Source Supply) is open. _ □ Ensure SKX Byp PnI Bkr 5 (MKB Alt AC Source Supply) is open. d. Ensure "KXB DISC SWITCH" (Battery Room, column BB58) is open.

MNS AP/1/A/5500/15 UNIT 1		LOSS OF VITAL Enclos Resto	OR AUX ure 24 - Pa ring Pow a	CONTF age 3 of er To K	ROL F f 31 (XB	POWER	PAGE NO 217 of 27 Rev. 21). 79
3	3. (Continued)					in a fair an		
-	e. On SKX Bre Kirk key to AC Output	eaker Alignment Panel, use close SKX BAP Bkr 3 (SKX to KXB).	•					
_	f. Check kirk l Inverter No.	key in DCB - 1D (Static SKX) - INSTALLED.		f. Per 1)	erform Ensi No.	the following: ure DCA - 1D (Statio SKX) is open.	c Inverter	
				2)	Rem	nove kirk key from D	CA - 1D.	
				3)	Inse	rt kirk key in DCB -	1D.	
-	g. Using Kirk Inverter No.	key close DCB - 1D (Static SKX).						
	h. On SKX Sta following:	atic Inverter, perform the						
	1) Ensure Bkr 2 (D	Kirk key installed in SKX In ICB to SKX DC Supply).	v					
	2) Place "F "DCB" p	PRECHARGE" switch to position and hold.						
	3) <u>WHEN</u> been lit the follo success	'PRECHARGE" light has 10 seconds, <u>THEN</u> perform wing substeps in rapid ion:	1					
	a) Rele	ease "PRECHARGE" switch	٦.					
	b) Clos SKX	e SKX Inv Bkr 2 (DCB to DC Supply).						
	4) Check t	he following indications:		4)	Perf	orm the following:		
	🗆 "INVE VOLT 116 -	ERTER OUTPUT "AGE" - 124 VOLTS			a) <u>I</u> t	<u>F</u> Inverter output vo han 110 Volts, <u>THE</u> [O Step 2.	ltage is less <u>N RETURN</u>	
	🗆 "INVE FREC	ERTER OUTPUT QUENCY'' - 59.7 - 60.3 HZ.			b) <u>I</u> 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	<u>F</u> Inverter output vo greater than 110 Vol notify IAE to investig abnormal indication allows.	ltage is ts, <u>THEN</u> ate as time	

UNIT 1

LOSS OF VITAL OR AUX CONTROL POWER

Enclosure 24 - Page 4 of 31 Restoring Power To KXB

3. (C	ontinued)	
_	_ 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.	2) Depress "INVERTER TO LOAD" pushbutton.
_	 _ 3) Ensure SKX Byp Pnl Bkr 6 (SKX Byp Pnl AC⁻Output) is closed. 	
	4) Check the following indications:	4) Perform the following:
	🛛 "SYSTEM OUTPUT VOLTAGE" - 116 - 124 VOLTS	a) <u>IF</u> System output voltage is less than 110 Volts, <u>THEN RETURN</u> TO Step 2
	□ "SYSTEM OUTPUT FREQUENCY" - 59.7 - 60.3 HZ	b) IF System output voltage is
	"SYSTEM OUTPUT CURRENT" - LESS THAN 292 AMPS.	allows.
j.	On <u>SKX</u> Static Inverter, ensure "ALARM CIRCUIT" is "ON".	
k.	On <u>KXB</u> Static Inverter, ensure "ALARM CIRCUIT" is "OFF".	
I.	Notify Control Room that KXB is energized.	

LOSS OF VITAL OR AUX CONTROL POWER

Enclosure 24 - Page 5 of 31 Restoring Power To KXB PAGE NO. 219 of 279 Rev. 21

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.

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-	UNIT 1	Restorin	g Power To KXB	Rev. 21	
4.	Align KXB Inv follows:	erter to KXB panelboard as			
	a. Perform the Inverter:	e following at KXB Static			
	1) Ensure AC Out	KXB Inv Sw 2 (KXB Inverter put) is open.			
	2) Ensure DC Sup	KXB Inv Bkr 1 (DCB to KXB ply) is open.			
	_ b. On SKX Bro ensure SKX Output to K	eaker Alignment Panel, (BAP Bkr 3 (SKX AC XB) is open.			
	_ c. Ensure MK Manual Byp open.	B - 1B (Inverter No. KXB bass SW Alternate Supply) is			
	_ d. Ensure DCI KXB) is clos	B - 2G (Static Inverter No. sed.			
_	_ e. Close "KXB Room, colu	DISC SWITCH" (Battery mn BB58).			

UNIT 1

LOSS OF VITAL OR AUX CONTROL POWER

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- 4. (Continued)
 - f. Perform the following at KXB Static Inverter:
 - ____1) Depress and hold "PRECHARGE" pushbutton.
 - <u>WHEN</u> "PRECHARGE" light has been lit 10 seconds, <u>THEN</u> 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) <u>IF</u> Inverter output voltage is less than 110 Volts, <u>THEN RETURN</u> <u>TO</u> Step 2.
 - b) <u>IF</u> Inverter output volts are greater than 110 Volts, <u>THEN</u> notify IAE to investigate abnormal indication as time allows.

MNS LOSS OF VITAL OR AUX CONTROL POWER

UNIT 1

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	המתחינים המחינים המיניים]
4. (Continued)				
	g. Perform the following at the KXB Stati 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.	—	3) D pi	epress "INVERTER TO LOAD" ushbutton.	
	4) Check the following indications:		4) Po	erform the following:	
	LESS THAN 292 AMPS	-	a)	 <u>IF</u> System output voltage is less than 110 Volts, <u>THEN RETURN</u> TO Step 2. 	
	🗆 "SYSTEM OUTPUT VOLTAGE" 116 - 124 VOLTS	-	b)	<u>IF</u> System output voltage is greater than 110 Volts. THEN	
	D "SYSTEM OUTPUT FREQUENCY" - 59.7 - 60.3 HZ.			notify IAE to investigate abnormal indication as time allows.	
	n. On <u>KXB</u> Static Inverter, ensure "ALAR CIRCUIT" is "ON".	VI			
	 <u>IF SKX</u> Static Inverter shutdown, <u>THEI</u> ensure "ALARM CIRCUIT" is "OFF" or <u>SKX</u> Static Inverter. 	<u>1</u>			
-	. Notify Control Room that KXB panelboard is energized.				
•					

MNS LOSS OF VITAL OR AUX CONTROL POWER PAGE NO. AP/1/A/5500/15 223 of 279 Enclosure 24 - Page 9 of 31 Rev. 21 **UNIT** 1 **Restoring Power To KXB** 4. (Continued) With KXB Inverter in service, MKB is normally aligned to KXB Inverter as a NOTE 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). I. Exit this enclosure.

MNS AP/1/A/5500/15 UNIT 1	LOSS OF VITAL OR AUX CONTROL POWER P Enclosure 24 - Page 10 of 31 Restoring Power To KXB		
5. Align Distribut panelboard the Bypass Panel a. On 1LAMP1 (located in E DD-55), che POWER SC	tion Center MKB to KXB rough the KXB Inverter as follows: I Panel Module 1LAM12 Battery Room, column eck #2 LED "MKB REG. DURCE LOW" light - DARK	 a. Perform the following: 1) <u>IF</u> another source is avaalign to KXB panelboard <u>RETURN TO</u> Step 2. 	ilable to , <u>THEN</u>
•		NOTE Distribution Center MKB can be energized by one of the following methods: Image: From MCC SMXT which is fed from 2SLXA (normal) of 2SLXA (normal) of 1SLXH (alternate) OR Image: Cross-tied to Distribution Center MKA, which is fed from MCC SMXS which is fed from 1SLXF (normal) of 2SLXF (alternate) 2) Attempt to energize MKB SMXT. 3) IF MKB cannot be energing SMXT.	f T, pr). er d , or b. from MCC zed from ross-tying osure 33 KB). B is
b. Check MKA 240/120 VAC	- 2C (Bus MKA Tie Bkr To C Bus MKB) - OPEN.	b. Observe Note prior to Step 6 <u>TO</u> Step 6.	and <u>GO</u>

UNIT 1

LOSS OF VITAL OR AUX CONTROL POWER

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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.
	 On 2KU Inv Byp Panel, check the following indications: 	2) GO TO Step 5.g.
	D "INVERTER SUPPLYING LOAD light - LIT.)"
	0 "2KU MAN BYP SW" in - "NORMAL OPERATION".	
	_ d. <u>GO TO</u> Step 5.k.	
	 Check 2KU panelboard aligned to SKX Inverter as follows: 	<pre></pre>
	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. <u>GO TO</u> Step 5.k.	

AP/	MNS AP/1/A/5500/15LOSS OF VITAL OR AUX CONTROL POWER Enclosure 24 - Page 12 of 31 Restoring Power To KXB			PAGE NO. 226 of 279 Rev. 21	
	5. (Continued) g. In Unit 2 MC panelboard source as fo 1) On SKD (column SELECT	S Set Room, check 2KDCS aligned to its normal powe ollows: CS Alignment Panel CC-59), check "SKDCS OR SWITCH" in - "OFF".	51 r	 Perform the following: a) IF "SKDCS SELEC SWITCH" in "MKA" THEN GO TO Step b) IF "SKDCS SELEC SWITCH" in "MKB" THEN perform the f (1) On SKDCS UF status of "INVE LOAD" pushbu LIT OR (2) IF LED is dark, observe Cautio Step 5.i and Ge (3) IF LED is lit, TH Step 5.k. 	TOR position, 5.g.2). TOR position, ollowing: 2S, record RTER TO tton LED: DARK THEN D DARK THEN D TO Step 5.i.
-	2) On 2KD0 TO LOAI h. <u>GO TO</u> Step	CS UPS, check "INVERTE D" pushbutton LED - LIT. 5.k.	R	2) Observe Caution prior to and <u>GO TO</u> Step 5.i.	o Step 5.i

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LOSS OF VITAL OR AUX CONTROL POWER

UNIT 1

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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 continuina:
- □ Evaluate reducing the number of loads on MKB.
- ___ Devaluate the potential for transformer overload with KXB aligned to MKB.
- ___ D 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.
 - Ι. 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).
- n. Close MKB 1B (Inverter No. KXB Manual Bypass SW Alternate Supply).

m. RETURN TO Step 2.

n. RETURN TO Step 2.

UNIT 1

LOSS OF VITAL OR AUX CONTROL POWER

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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:
 - __ D "SYSTEM OUTPUT CURRENT" -LESS THAN 292 AMPS
 - ___ D "SYSTEM OUTPUT VOLTAGE" -116 - 124 VOLTS
 - __ O "SYSTEM OUTPUT FREQUENCY" - 59.7 - 60.3 HZ.
- p. <u>IF SKX</u> Static Inverter shutdown, <u>THEN</u> ensure "ALARM CIRCUIT" is "OFF" on <u>SKX</u> Static Inverter.
- ___ q. On <u>KXB</u> Static Inverter, ensure "ALARM CIRCUIT" is "OFF".
- ___ r. Notify Control Room that KXB panelboard is energized.
- ____ s. Exit this enclosure.

____ 2) <u>RETURN TO</u> Step 2.

- 3) Perform the following:
- ____a) <u>IF</u> System output voltage is less than 110 Volts, <u>THEN RETURN</u> <u>TO</u> Step 2.

____b) <u>IF</u> System output voltage is greater than 110 Volts, <u>THEN</u> notify IAE to investigate abnormal indication as time allows.
MNS AP/1/A/5500/15 UNIT 1		LOSS OF VITAL OR AUX CONTROL POWER Enclosure 24 - Page 15 of 31 Restoring Power To KXB				
<u>NOTE</u>	The transfo possible lo MKA/MKB	ormer connected to MKA a ads. Any of the following	nd MKB ca panelboar	an safe ds may	ely carry only three of eigh y already be aligned to	nt
	🗆 1KU					
	□ 2KU					
	D 1KDCS1					
cu £-	PROPER ADAR	\mathbf{U}				
10 a.	Check MKA Regulated P CLOSED.	- 1A (240/120 VAC ower Pnlbd No. KRA) -		a. <u>G</u>	<u>O</u>	
10 a. b.	rrently energ llows: Check MKA Regulated P CLOSED. Circle "KRA'	- 1A (240/120 VAC ower Pnlbd No. KRA) -		a. <u>G</u>	<u>O</u> <u>TO</u> Step 6.c.	
10 a. b. c.	rrently energ llows: Check MKA Regulated P CLOSED. Circle "KRA" Check MKB Regulated P CLOSED.	- 1A (240/120 VAC Power Pnlbd No. KRA) - ' in Note prior to Step 6. - 1A (240/120 VAC Power Pnlbd No. KRB) -		a. <u>G</u> c. <u>G</u>	<u>O TO</u> Step 6.c. <u>O TO</u> Step 6.e.	
10 a. b. c. d.	rrently energ llows: Check MKA Regulated P CLOSED. Circle "KRA" Check MKB Regulated P CLOSED. Circle "KRB"	- 1A (240/120 VAC ower Pnlbd No. KRA) - ' in Note prior to Step 6. - 1A (240/120 VAC ower Pnlbd No. KRB) - ' in Note prior to Step 6.		a. <u>Gi</u> c. <u>G</u> i	<u>O</u> TO Step 6.c. <u>O TO</u> Step 6.e.	
10 a. b. c. d. e.	rrently energ lows: Check MKA Regulated P CLOSED. Circle "KRA" Check MKB Regulated P CLOSED. Circle "KRB" On SKX Bre check the fo	- 1A (240/120 VAC Power Pnlbd No. KRA) - ' in Note prior to Step 6. - 1A (240/120 VAC Power Pnlbd No. KRB) - ' in Note prior to Step 6. aker Alignment Panel, llowing breakers - OPEN:		a. <u>G</u> c. <u>G</u> e. Pe	O TO Step 6.c. O TO Step 6.e. erform the following:	
10 a. b. c. d. e.	rrently energ llows: Check MKA Regulated P CLOSED. Circle "KRA" Check MKB Regulated P CLOSED. Circle "KRB" On SKX Bre check the fo	Jized from MKA/MKB as - 1A (240/120 VAC ower Pnlbd No. KRA) - ' in Note prior to Step 6. - 1A (240/120 VAC ower Pnlbd No. KRB) - ' in Note prior to Step 6. aker Alignment Panel, llowing breakers - OPEN: Bkr 1 (SKX AC Output to		a. <u>G</u> c. <u>G</u> e. Pe 1)	D TO Step 6.c. D TO Step 6.e. erform the following: Record below which par associated with the clos (i.e. KXA, 1KU, or 2KU)	nelboard is ed breaker :
10 a. b. c. d. 	rrently energ llows: Check MKA Regulated P CLOSED. Circle "KRA" Check MKB Regulated P CLOSED. Circle "KRB" On SKX Bre check the fo SKX BAP KXA)	Jized from MKA/MKB as - 1A (240/120 VAC ower Pnlbd No. KRA) - ' in Note prior to Step 6. - 1A (240/120 VAC ower Pnlbd No. KRB) - ' in Note prior to Step 6. aker Alignment Panel, llowing breakers - OPEN: Bkr 1 (SKX AC Output to Bkr 2 (SKX AC Output to		a. <u>G</u> c. <u>G</u> e. Pe 1)	D TO Step 6.c. D TO Step 6.e. erform the following: Record below which par associated with the clos (i.e. KXA, 1KU, or 2KU)	nelboard is ed breaker :

MNS AP/1/A/5500/15 UNIT 1	LOSS OF VITAL Enclose Resto	_ OR AUX ure 24 - Pa oring Pow	CONTROL POWER age 16 of 31 er To KXB	PAGE NO. 230 of 279 Rev. 21
6. (Continued)				
f. <u>GO TO</u> Step	o 6.h.			
g. Check if SK follows:	X Inverter is in service as		g. Circle the panelboard in the to Step 6 that was recorded	e Note prior I in Step 6.e.
□ On SKX S Panel, ch SUPPLYI	Static Inverter Bypass eck "INVERTER NG LOAD" light - LIT.			
□ On SKX S Panel, ch SWITCH' OPERAT	Static Inverter Bypass eck the "MANUAL BYPAS ' in - "NORMAL ION".	S		
h. Check if 1Kl follows:	U Inverter is in service as			
 1) Check "′ (Battery CLOSEI	1KU DISC SWITCH'' Room, column BB54) -).		1) <u>GO TO</u> Step 6.i.	
2) Check th	ne following indications:		2) Circle "1KU" in Note price	or to Step 6.
□ On 1k "INVE light -	(U Inv Byp Panel, check RTER SUPPLYING LOAD LIT.)''		
0n 1K "1KU "NOR	(U Inv Byp Panel, check MAN BYP SW" in - MAL OPERATION".			

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AP/1/A/5500/15

UNIT 1

LOSS OF VITAL OR AUX CONTROL POWER

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6. (Continued)	
 Check if KXA Inverter is in service as follows: 	
1) Check "KXA DISC SWITCH" (Battery Room, column BB54) - CLOSED.	1) <u>GO TO</u> 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) <u>GO TO</u> 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".	

LOSS OF VITAL OR AUX CONTROL POWER

MNS AP/1/A/5500/15

UNIT 1

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6	. (Continued)		
	 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".		 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: On SKDCS UPS, record status of "INVERTER TO LOAD" pushbutton LED: IIT OR DARK IF LED is dark, THEN circle "1KDCS1" in Note prior to Step 6. GO TO Step 6.1.
	2) On 1KDCS UPS, check "INVERTEI TO LOAD" pushbutton LED - LIT.	R	2) Circle "1KDCS1" in Note prior to Step 6.

MNS LOSS OF VITA AP/1/A/5500/15 Enclo UNIT 1 Res		R AUX CONTROL POWER PAGE NO 24 - Page 19 of 31 233 of 27 g Power To KXB Rev. 21
	300,0000	
 6. (Continued) i. In Unit 2 MG Set Roc 2KDCS1 Inverter is in follows: 1) On SKDCS Aligni (column CC-59), SELECTOR SWIT 	om, check if n service as ment Panel check "SKDCS TCH" in - "OFF".	 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:
 2) On 2KDCS UPS, a TO LOAD" pushbu m. Check the total numbe circled in Note prior to THAN OR EQUAL TO n. <u>RETURN TO</u> Step 5.k 	check "INVERTER utton LED - LIT. er of panelboards Step 6 - LESS O TWO.	 (3) <u>GO TO</u> Step 6.m. 2) Circle "2KDCS1" in Note prior to Step 6. m. Observe Caution prior to Step 6.o and <u>GO TO</u> Step 6.o.



UNIT 1

LOSS OF VITAL OR AUX CONTROL POWER

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6. (Continued)

<u>CAUTION</u> 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, <u>THEN RETURN TO</u> Step 5.k.

OR

___ □ IF station management desires to align KXB panelboard to another source, THEN RETURN TO Step 2.

UNIT 1

LOSS OF VITAL OR AUX CONTROL POWER

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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

A	MNS P/1/A/5500/15 UNIT 1	LOSS OF VITAI Enclosi Resto	LOSS OF VITAL OR AUX CONTROL POWER Enclosure 24 - Page 22 of 31 Restoring Power To KXB			PAGE NO. 236 of 279 Rev. 21
		18888888888888888888				
	7. (Continued) b. On 1LAMP1 (located in F DD-55), che POWER SC	1 Panel Module 1LAM12 Battery Room, column eck #2 LED "MKB REG. DURCE LOW" light - DARK	<u>,</u>	b. Perforr 1) <u>IF</u> a alig <u>RE</u>	m the following: another source is ava on to KXB panelboard T URN TO Step 2.	ilable to , <u>THEN</u>
	POWER SOURCE LOW' light - DARK.			NOTE 2) Atte SM2 3) IF M SM2 (Cro 4) Do n ener	Distribution Center MKB can be energized by one of the following methods: From MCC SMXT which is fed from 2SLXA (normal) of 1SLXH (alternate OR Cross-tied to Distribution Center MKA, which is fed from MCC SMXS which is fed from 1SLXF (normal) of 2SLXF (alternate) empt to energize MKB XT. MKB cannot be energian XT, <u>THEN</u> evaluate of A and MKB <u>PER</u> Enclose- tying MKA and MI not continue until MKI rgized.	F, or). er from MCC zed from ross-tying osure 33 (B). 3 is
	c. Check MKA 240/120 VAC	- 2C (Bus MKA Tie Bkr To C Bus MKB) - OPEN.	_	c. Observe <u>TO</u> Step	e Note prior to Step 8 o 8.	and <u>GO</u>

LOSS OF VITAL OR AUX CONTROL POWER

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7	. (Continued)			
	d. Check 2KU panelboard aligned to its normal power source as follows:		_ d.	<u>GO</u>
	☐ 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. <u>GO TO</u> Step 7.j.			
	f. In Unit 2 MG Set Room, check 2KDCS panelboard aligned to its normal power source as follows:	1 r		
	1) On SKDCS Alignment Panel (column CC-59) check "SKDCS			1) Perform the following:
	SELECTOR SWITCH" in - "OFF".			a) <u>IF</u> "SKDCS SELECTOR SWITCH" in "MKA" position, <u>THEN GO TO</u> Step 7.f.2).
				 b) <u>IF</u> "SKDCS SELECTOR SWITCH" in "MKB" position, <u>THEN</u> perform the following:
				(1) On SKDCS UPS, record status of "INVERTER TO LOAD" pushbutton LED:
				🗆 LIT OR 🗆 DARK
				(2) <u>IF</u> LED is dark, <u>THEN</u> observe Caution prior to Step 7.h and <u>GO TO</u> Step 7.h.
				(3) IF LED is lit, <u>THEN GO TO</u> Step 7.j.
	2) On 2KDCS UPS, check "INVERTER TO LOAD" pushbutton LED - LIT.	R	2	 Observe Caution prior to Step 7.h and <u>GO</u> <u>TO</u> Step 7.h.

LOSS OF VITAL OR AUX CONTROL POWER

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UNIT 1

				7
7. (Continued)				
g. <u>GO TO</u>	Step 7.j.			
CAUTION	If KXB panelboard is aligned transformer supplying MKB actual loads at that moment	d to MKB may bec	in subsequent steps, the ome overloaded, depending on	
h. Contac the follo	t station management to perforr wing prior to continuing:	n		
D Evalu loads	uate reducing the number of on MKB.			
D Evalu overl	uate the potential for transforme oad with KXB aligned to MKB.	er		
□ Evalu from	ate energizing KXB panelboard another source <u>PER</u> Step 2.	b		
i. Perform previous	n one of the following based on s evaluation:			
□ <u>IF</u> sta proce <u>THE</u>	ation management decides to eed with placing KXB on MKB, <u>I GO TO</u> Step 7.j.			
OR				
□ <u>IF</u> sta align sourc	tion management desires to KXB panelboard to another e, <u>THEN RETURN TO</u> Step 2.			
j. On SKX following	Static Inverter, perform the			
1) Ensi Outr	ure SKX Inv Bkr 3 (SKX Inv AC out) is open.			
2) Ensu DC \$	ure SKX Inv Bkr 2 (DCB to SKX Supply) is open.			
k. Ensure ' Room, c	'KXB DISC SWITCH'' (Battery olumn BB58) is open.			

MNS AP/1/A/5500/15 UNIT 1	LOSS OF VITAL Enclosu Resto	OR AUX CONTROL POWER PAGE NO. 239 of 279 ring Power To KXB
7. (Continued) I. Check No. SK Supply)	kirk key in MKB - 2C (Inverter X Manual Bypass SW Alternate - INSTALLED.	 I. 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 K No. SK Supply) n. On SKX Kirk key AC Out o. Perform Inverter	Cirk key, close MKB - 2C (Invert X Manual Bypass SW Alternate C Breaker Alignment Panel, use to close SKX BAP Bkr 3 (SKX put to KXB). The following at the SKX Static Bypass Panel:	er m. <u>RETURN TO</u> Step 2. n. <u>RETURN TO</u> Step 2.
1) Usir Bkr 2) Clos Pnl 3) Ens SWI	ng Kirk key, close SKX Byp Pnl 5 (MKB Alt AC Source Supply). se SKX Byp Pnl Bkr 6 (SKX Byp AC Output). ure the "MANUAL BYPASS TCH" is selected to	 1) <u>RETURN TO</u> Step 2. 2) <u>RETURN TO</u> Step 2. 3) <u>RETURN TO</u> Step 2.
"AL LOA 4) Che — □ "S 1' — □ "S FI □ "S LE	TERNATE AC SOURCE TO D". ck the following indications: SYSTEM OUTPUT VOLTAGE" 16 - 124 VOLTS SYSTEM OUTPUT REQUENCY" - 59.7 - 60.3 HZ SYSTEM OUTPUT CURRENT" ESS THAN 292 AMPS.	 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.

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7	. (Co	ntinued)		
_	_ p.	On <u>SKX</u> Static Inverter, ensure "ALAR CIRCUIT" is "OFF".	М	
_	_ q.	On <u>KXB</u> Static Inverter, ensure "ALAR CIRCUIT" is "OFF".	Μ	
	r.	Notify Control Room that KXB panelboard is energized.		
_	_ S.	WHEN time allows, <u>THEN</u> review breaker manipulations made in this enclosure and evaluate restoring breakers to normal as appropriate.		

_____t. Exit this enclosure.

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		000000000000000000000000000000000000000				
<u>NOTE</u>	The transfo possible lo MKA/MKB	ormer connected to MKA a ads. Any of the following	nd MKB c panelboar	an safely carry only three of eigh ds may already be aligned to	it	
	🗆 1KU					
	🗆 2KU					
		-				
8. D c fo	etermine the urrently energ bllows:	number of panelboards jized from MKA/MKB as				
a	. Check MKA Regulated P CLOSED.	- 1A (240/120 VAC ower Pnlbd No. KRA) -		a. <u>GO TO</u> Step 8.c.		
b.	Circle "KRA"	in Note prior to Step 8.				
c.	Check MKB Regulated P CLOSED.	- 1A (240/120 VAC ower Pnlbd No. KRB) -		c. <u>GO TO</u> Step 8.e.		
d.	Circle "KRB"	in Note prior to Step 8.				
e.	Check if 1KL follows:	I Inverter is in service as	—	e. Circle "1KU" in Note prior to	Step 8.	
_	_ □ On 1KU In "INVERTE light - LIT.	v Byp Panel, check R SUPPLYING LOAD''				
<u> </u>	On 1KU In MAN BYP OPERATIO	v Byp Panel, check "1KU SW" in - "NORMAL DN".				

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8	. (Continued)			
	f. Check if KXA Inverter is in service as follows:		f. Circle "KXA" in Note prior to Step 8.	
	☐ 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".	6		
	g. Check if 2KU Inverter is in service as follows:		g. Circle "2KU" in Note prior to Step 8.	
	On 2KU Inv Byp Panel, check "INVERTER SUPPLYING LOAD" light - LIT.			
	On 2KU Inv Byp Panel, check "2KU MAN BYP SW" in - "NORMAL OPERATION".			

N AP/1/A U	INS /5500/15 NIT 1	LOSS OF VITAL OR AUX CONTROL POWER Enclosure 24 - Page 29 of 31 Restoring Power To KXB			- POWER 1	PAGE NO. 243 of 279 Rev. 21
8. (C 	Continued) h. In Unit 2 MG 1KDCS1 Inv follows: 1) On SKD (column SELECT	S Set Room, check if rerter is in service as CS Alignment Panel CC-59), check "SKDCS OR SWITCH" in - "OFF".		1) Pe a) b)	rform the following: IF "SKDCS SELECT SWITCH" in "MKB" p THEN GO TO Step 8 IF "SKDCS SELECT SWITCH" in "MKA" p THEN perform the fo (1) On SKDCS UPS status of "INVEF LOAD" pushbutt □ LIT OR (2) IF LED is dark, <u>1</u> "1KDCS1" in No Step 8. (3) GO TO Step 8.i.	OR position, 3.h.2). OR position, llowing: S, record RTER TO con LED: DARK IHEN circle te prior to
_	_ 2) On 1KDC TO LOAE	S UPS, check "INVERTEI)" pushbutton LED - LIT.	२	2) Circ Stej	cle "1KDCS1" in Note p 8.	prior to

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]
	8. (Continued)					I
	i. In Unit 2 MC 2KDCS1 Inv follows:	S Set Room, check if verter is in service as				
	1) On SKD (column SELECT	CS Alignment Panel CC-59), check "SKDCS OR SWITCH" in - "OFF".		 Perform the following: a) IF "SKDCS SELEC SWITCH" in "MKA" THEN GO TO Step b) IF "SKDCS SELEC SWITCH" in "MKB" THEN perform the f (1) On SKDCS UF status of "INVE LOAD" pushbu [1] LIT OR [_ (2) IF LED is dark, "2KDCS1" in N Step 8. (3) GO TO Step 8. 	TOR position, 8.i.2). TOR position, following: PS, record ERTER TO itton LED: _ DARK , <u>THEN</u> circle lote prior to	
	2) On 2KDC TO LOAE	S UPS, check "INVERTER)" pushbutton LED - LIT.	:	2) Circle "2KDCS1" in Note Step 8.	e prior to	
	j. Check the tot circled in Not THAN OR EC k. <u>RETURN TO</u>	al number of panelboards e prior to Step 8 - LESS QUAL TO TWO. Step 7.j.	·	j. Observe Caution prior to St <u>GO TO</u> Step 8.I.	ep 8.I and	
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8. (Continued)

<u>CAUTION</u> 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.

- I. 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.