

DUKE ENERGY
McGuire Nuclear Station

Draft

**2011 INITIAL LICENSE
SIM/PLANT JPMS**



LEAD EXAMINER: Edwin Lea

Facility:	McGuire	Date of Examination:	6/27/11
Exam Level (circle one):	RO (only) / SRO(I) / SRO (U)	Operating Test No.:	N11-1
Control Room Systems® (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)			
System / JPM Title		Type Code*	Safety Function
A. 010 Pressurizer Pressure Control System Place LTOP in Service		S, D, P, L	3
B. 028 Hydrogen Recombiner and Purge Control System Manually Align Phase B HVAC Equipment		S, D, P, EN	5
C. 004 Chemical and Volume Control System Emergency Borate the RCS		S, N, A	1
D. EPE 074 Inadequate Core Cooling Establish NC System Feed and Bleed		S, M, EN, A	4P
E. 045 Main Turbine Generator System Perform the Main Turbine Overspeed Trip Test		S, D, A	4S
F. APE 067 Plant Fire On Site Restore from a Fire in the Unit 1 Cable Spreading Room		S, N, A	8
G. 006 Emergency Core Cooling System Increase Pressure in Cold Leg Accumulator 1A		S, D, EN	2
H. 062 AC Electrical Distribution Restore Power to 6900V Buses		S, N	6
In-Plant Systems® (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
I. 061 Auxiliary/Emergency Feedwater System Start and Stop # 1 Turbine Driven CA Pump		M, R	4S
J. 086 Fire Protection System Manually Initiate Diesel Generator Halon		D	8
K. EPE 055 Station Blackout Establish NC Pump Seal Injection from the SSF		D, E	6

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

JPM Summary

JPM A This is a bank JPM. The Operator will be placed in a situation in which Unit 1 is in a cooldown and depressurization in accordance with OP/1/A/6100/SD-4, (Cooldown to 240 Degrees F). The operator will be told that the 1A and 1B NCPs are operating, that NC System pressure is 347 psig and NC System temperature is 310-320°F. The operator will be asked to place the LTOP System in operation in accordance with Enclosure 4.1 of OP/1/A/6100/SO-10, (Controlling Procedure for LTOP Operation), and monitor for proper operation.

JPM B This is a bank JPM. The operator will be told that they are the Unit 2 BOP, and that Unit 1 has experienced a Large Break LOCA. The operator will be directed to check Phase B HVAC equipment in accordance with Enclosure 2, (Phase B HVAC Equipment), of EP/1/A/5000/E-0, (Reactor Trip or Safety Injection). During the performance of Enclosure 2, the operator will recognize that neither train of the VE and VX Systems automatically started. The operator will be expected to manually start the both Trains of VE and VX Systems.

JPM C This is a new JPM. The operator will be told that with the plant at power, a Reactor Makeup System failure has resulted automatic Control Rod insertion, that MCB Annunciator 1AD-2, A9, CONTROL ROD BANK LO LIMIT, has alarmed, that AP/1/A/5500/38 (Emergency Boration) has been entered, and that the 1B BA Transfer Pump is OOS. The operator will be directed to initiate Emergency Boration by performing Step 12 of AP/1/A/5500/38 (Emergency Boration). When the operator attempts to start the 1A BA Transfer Pump the Boric Acid Filter will become plugged (**Alternate Path**). The operator will be expected to establish Emergency Boration from the FWST.

JPM D This is a modified JPM that uses Bank JPM PS-NC-46 as its basis. The operator will be told that a Reactor Trip on Lo-Lo S/G Level has occurred due to the loss of both Main Feedwater Pumps, that the CA System will not start, that EP/1/A/5000/FR-H.1 (Loss of Secondary Heat Sink) has been implemented, and that Feed and Bleed initiation criteria has been met. The operator will be directed to initiate an NC System Feed and Bleed by performing Steps 22 - 28 of EP/1/A/5000/FR-H.1 (Loss of Secondary Heat Sink). When

the operator attempts to verify that a high pressure injection flowpath exists, it will be observed that 1NI-9A and 10B (Cold Leg Injection Isolation Valves) have failed to open automatically (**Alternate Path**). The operator will be expected to establish an RCS feed and bleed flowpath such that all NCP's off, flow is High Pressure Injection flow is established through NI-9/10, at least two Pzr PORVs are open, and both NV Pump Recirculation Valves are closed within 5 minutes of the first Pzr PORV being opened. The closure of the NV Pump Recirculation Valves is a Time Critical Task (5 minutes) as identified in PT/0/A/4600/113, (Operator Time Critical Task Verification), Enclosure 13.10, (Initiate Feed and Bleed Once Criteria Met).

JPM E This is Bank JPM OP-MC-GEN-EHC-154A. The operator will be told that Unit 1 is starting up after a refueling outage, that the Turbine/Generator is off line and rolling at 1800 RPM in preparation for performing PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test), that all prerequisite conditions have been met, that two operators have been stationed at the Turbine as required, and that communications have been established with all involved. The operator will be directed to complete the Turbine OPC and Mechanical Overspeed Trip Test per PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test), starting with Step 12.7. The operator will raise Turbine speed to OPC setpoint, and then raise speed until the Turbine Overspeed trip should be actuated (**Alternate Path**). The operator is expected to recognize the turbine has failed to trip at the expected setpoint and then manually trip the Turbine.

JPM F This is a new JPM. The operator will be told that Unit 1 is at 100% power and that a fire has been reported in the Unit 1 Cable Spreading Room. The operator will be told that the crew has implemented AP/1/A/5500/45 (Plant Fire) and is presently in Enclosure 17 (AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and Unit 2 Actions. The operator will also be told that several control room switch manipulations have been made, that the Fire Brigade has reported that the fire is no longer active, and that Station Management has indicated that the crew may return Control Room controls to normal as identified within Enclosure 17. The operator will be directed to restore the Control Room controls to normal by performing Step 21.a through e of Enclosure 17 (AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and Unit 2 Actions) of AP/1/A/5500/45 (Plant Fire). The operator will be expected to determine that one Pzr PORV has inadvertently opened, and take action to isolate it by ensuring that its isolation valves is closed, and by directing that its motor breaker be opened (**Alternate Path**). The operator will then open the remaining Pzr PORV isolation valves, direct that the motor breaker for 1CA-7AB be closed, and open the manual loaders for the main Steam Line PORVs while the valves remain closed.

JPM G This is Bank JPM ECC-CLA-69. The operator will be told that the plant is at 100% power, that the 1A Cold Leg Accumulator Abnormal Press Alarm is received, and that the 1A Cold Leg Accumulator pressure is approximately 590 psig and holding. The operator will be directed to increase the 1A Cold Leg Accumulator pressure to approximately 620 psig per OP/1/A/6200/009 (Accumulator Operation) Enclosure 4.3 (Adjusting Accumulators Pressure). The operator will be expected to align N₂ to CLA 1A and raise pressure to greater than 620 psig and less than 639 psig.

JPM H This is a new JPM. The operator will be told that a total loss of Offsite Power has occurred at both Units, that Unit 1 has tripped from 100% power, that AP/1/A/5500/07 (Loss of Electrical Power), Case I (Loss of Normal Power to 1ETA and 1ETB) has been implemented and that the crew is preparing to restore power to the 6900VAC Buses.

The operator will be directed to restore power to the 6900V buses by performing Steps 43.n-q of AP/1/A/5500/07 (Loss of Electrical Power), Case I (Loss of Normal Power to 1ETA and 1ETB). The operator will be expected to re-energizes all four 6900V Buses per AP/1/A/5500/07.

- JPM I This is a modified JPM that uses Bank JPM CF-CA-256. The Operator will be told that Unit 1 is at 100% power when the OAC alarm M1A1276 (U1 CA Temp at Chk Vlv 1CA-37) is received, that the temperature in the TD CA Pump discharge to the 1D S/G is 223°F, and that the CRS has determined the #1 Turbine Driven CA Pump should be started to cool the piping to the 1D S/G. The operator will be directed to locally start the Unit 1 Turbine Driven CA Pump per OP/1/A/6250/002 (Auxiliary Feedwater System), Enclosure 4.4 (Manual Operation of #1 TD CA Pump). The operator will be expected to locally start the #1 TD CA Pump and align the CA System valves to provide the required cooling.
- JPM J This is Bank JPM SS-RFY-019. The operator will be told that the control power for the 1A D/G Halon Fire Protection System has been tagged out for Electrical Maintenance, that the Halon Bank transfer switch is selected to the "MAIN" position, that they have been assigned as the Fire Watch, and that a Fuel Oil fire starts in the 1A D/G Room. The operator will be directed to Initiate a MANUAL PNEUMATIC actuation of the Halon Fire Suppression System to the 1A D/G Room, per OP/0/A/6400/002B (Halon Fire Protection System) Enclosure 4.3 (Local Manual Actuation of D/G Halon). The operator will be expected to manually align Halon to the 1A D/G Room and manually-pneumatically discharge the system into the room.
- JPM K This is Bank JPM-CP-AD-061T. The Operator will be placed in a situation in which a Loss of All AC has occurred on Unit 1. The operator will be told that EP/1/A/5000/ECA-0.0, "Loss of All AC Power" has been implemented, and that one operator has been dispatched to 1ETA to swap 1EMXA4. The operator will be asked to obtain the Brown Folder at SSF and complete Enclosure 1, (Unit 1 SSF-ECA-0.0 Actions), which will require the re-establishment of NCP Seal Water flow. The re-establishment of NCP Seal Water flow is a Time Critical Task (8 minutes) as identified in PT/0/A/4600/113, (Operator Time Critical Task Verification), Enclosure 13.11, (Initiate SSF NCP Seal Injection and Swap to the SSF).

SIM JPM A

ONLY 2 critical steps

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Place LTOP in ServiceJPM No.: 2011 Systems - Control Room JPM A

K/A Reference: 010, A4.03 (4.0/3.8)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: X Classroom _____ Simulator X Plant _____**READ TO THE EXAMINEE**

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

Initial Conditions:

- A Unit 1 NC cooldown and depressurization is in progress in accordance with OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F).
- Enclosure 4.2 (Cooldown to 240°F (Control Room Activities)) is in progress.
- The 1A and 1B NCPs are operating.
- NC System pressure is 340 psig and NC System temperature is 310-320°F.
- NC Pressure control via normal spray and PZR heaters.
- NC pressure is being controlled using 1NC-29C, 1B NC Loop Pzr Spray Control, in MANUAL.
- Enclosure 4.1 of OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation) has been completed through Step 3.13 1.

Task Standard: The operator will manually decrease NC System Pressure to 320-330 psig and place LTOP in service.

Required Materials: Info Stickers on Pzr PORV Controls stating "Ensure all personnel in Pzr Cavity are notified prior to cycling."

General References: OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F), Rev 50

2011 Systems - Control Room JPM A

NUREG 1021, Revision 9

Job Performance Measure Worksheet

OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation), Rev 32

Handouts:

Enclosure 4.2 (Cooldown to 240°F (Control Room Activities)) of OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F) marked up for place-keeping through Step 3.3.

OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation) Enclosure 4.1 (Placing LTOP System in Service per OP/1/A/6100/SD-4 (Cooldown to 240 degrees F)) marked up for place-keeping through Step 3.13.1.

Initiating Cue:

The CRS has directed you to adjust NC System pressure per Step 3.3 of Enclosure 4.2 (Cooldown to 240°F (Control Room Activities)) of OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F).

Then place the LTOP System in operation beginning with Step 3.13.2 - of Enclosure 4.1 of OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation) and monitor for proper operation.

Time Critical Task:

NO

Validation Time:

___ minutes

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-96 (360°F, 980 psig, A/B RCPs running).
2. Place in RUN
3. Adjust NCS Temperature to 300-320°F, and NCS Pressure to 340 psig.
4. Insert MALF-IPE0036 = 2 to bypass P-12, and allow all SD Valves.
5. Continue to adjust NCS to adjust NCS Temperature to 300-320°F, and NCS Pressure to 340 psig.
6. Insert LOA NC043 and LOA NC044 (Wide Range)
7. Place LTOP PORV switches is NORMAL
8. Insert LOA-NI014 (1NI A), LOA-NI015 (1NI B), LOA-NV046 (1NV A) and LOA-NV045 (PD Pump) - Breakers Racked Out.
9. When NCS Temperature/Pressure in range place SDS in AUTO (SG Pressure ≈70 psig)
10. Insert LOA-NI022 = RI, LOA-NI023 = RI, LOA-NI019 = RI, LOA-NI024 = RI, LOA-NI025 = RI, LOA-NI026 = RI, LOA-ND015 = RI, LOA-ND016 = RI, LOA-NS007 = RO, and LOA-NS008 = RO.
11. Ensure that Simulator reflects that Enclosure 4.1 of OP/1/A/6100/SO-10 is completed through Step 3.13.1
12. Freeze the Simulator

OR

1. Reset to IC-250 (March, 2011)
2. Momentarily go to RUN to acknowledge Alarms then place Simulator in FREEZE.
3. Ensure that the "AFD" Computer screen displays the "C/D Tab" panel and that the "BOP" screen displays the "NCLTOP" panel.
4. Place Info Stickers on PORV Controls.
5. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: During the performance of this JPM, the simulator operator will need to control CF flow to the SGs (Monitor Wide Range Levels).

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 4.2 of OP/1/A/6100/SD-4 marked up for place-keeping through Step 3.3 of OP/1/A/6100/SO-10, with Enclosure 4.1 marked up for place-keeping through step 3.13.1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Step 3.3) Continue depressurization to 320-330 psig.	<p>The operator observes M1A1359 is 340 psig.</p> <p>The operator adjusts Spray Valve(s) in the OPEN direction using the UP ARROWHEAD Pushbutton, and lowers NC System Pressure to < 330 psig.</p> <p>When NC System Pressure < 330 psig, the operator adjusts Spray Valve(s) in the CLOSED direction in order to maintain pressure 320-330 psig.</p> <p>The operator proceeds to Step 3.13.2 - of Enclosure 4.1 of OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation)</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	(Step 3.13.2) Ensure in service: M1A1359 (NC NR Pressure for 1NC-32B actuation). M1A1365 (NC NR Pressure for 1NC-34A actuation).	The operator calls up both points on OAC.		
3	(Step 3.13.3) Monitor: M1A1359 (NC NR Pressure for 1NC-32B actuation). M1A1365 (NC NR Pressure for 1NC-34A actuation).	The operator monitors both points and observes NC NR Pressure to be ≈ 340 psig.		
4	(Step 3.13.4) Ensure the following for A Cold Leg Accumulator: Pressure greater than 200 psig. Level less than 38.7% (7342 gallons maximum).	The operator observes 1NIP-5050 and 1NIP-5040, and determines A CLA pressure to be ≈ 625 psig. The operator observes 1NIP-5051 and 1NIP-5041, and determines A CLA Level to be $\approx 28\%$.		
5	(Step 3.13.5) Ensure the following for B Cold Leg Accumulator: Pressure greater than 200 psig. Level less than 38.7% (7342 gallons maximum).	The operator observes 1NIP-5070 and 1NIP-5060 and determines B CLA pressure to be ≈ 620 psig. The operator observes 1NIP-5071 and 1NIP-5061 and determines B CLA Level to be $\approx 28\%$.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	(Step 3.13.6) Ensure open: 1NC-31B (Pzr PORV Isol). 1NC-33A (Pzr PORV Isol).	The operator observes Red status light LIT, Green status light OFF for 1NC-31B. The operator observes Red status light LIT, Green status light OFF for 1NC-33A.		
7	(Note prior to Step 3.13.7) For NC Loop in which an NC Pump is operating, NR pressure may indicate up to 20 psig higher than NR pressure for NC Loop in which an NC Pump is NOT operating.	The operator reads the Note, and proceeds to Step 3.13.7.		
*8	(Step 3.13.7) When M1A1359 indicates 320-330 psig, perform the following: (Step 3.13.7.1) Select "LOW PRESS" on "PORV Overpress Protection Select 1NC-32B."	The operator observes M1A1359 is between 320-330 psig, and selects LOW PRESS on PORV Overpress Protection Select 1NC-32B.		
9	(Step 3.13.7.2) Check lit 1AD-6, F10 (PORV NC-32B Emerg CLA N ₂ Enabled)	The operator observes that 1AD-6, F-10 is LIT.		
10	(Step 3.13.7.3) Ensure open 1NI-431B (Emerg N2 from CLA to 1NC-32B & 36B).	The operator observes that Red status light is LIT, Green status light OFF for 1NI-431B. NOTE: If CLOSED, the presses the OPEN Pushbutton and Observes Red status light is LIT, Green status light OFF for 1NI-431B.	IS THIS Now Critical	

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	(Note prior to Step 3.13.7.4) Continue with the rest of the procedure while performing Step 3.13.7.4.	The operator reads the Note, and proceeds to Step 3.13.7.4.		
12	(Step 3.13.7.4) Place Info Sticker on control switch for 1NI-431B stating: "Do NOT operate, N ₂ aligned to 1NC-32B for LTOP."	<div>Cue:</div> <div>Another operator will fill out and place an Info Sticker for 1NI-431B</div> <div>The operator acknowledges and proceeds to Step 3.13.7.5.</div>		
13	(Step 3.13.7.5) Ensure 1NC-32B (Pzr PORV) in "AUTO."	The operator observes that Control Switch for 1NC-32B is in AUTO.		
*14	(Step 3.13.8) When M1A1365 indicates 320-330 psig, perform the following: (Step 3.13.8.1) Select "LOW PRESS" on "PORV Overpress Protection Select 1NC-34A."	The operator observes M1A1365 is between 320-330 psig, and selects LOW PRESS on PORV Overpress Protection Select 1NC-34A.		
15	(Step 3.13.8.2) Check lit 1AD-6, F9 (PORV NC-34A Emerg CLA N ₂ Enabled)	The operator observes that 1AD-6, F-9 is LIT.		
16	(Step 3.13.8.3) Ensure open 1NI-430A (Emerg N ₂ from CLA to 1NC-34A).	The operator observes that Red status light is LIT, Green status light OFF for 1NI-430A.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
17	(Note prior to Step 3.13.8.4) Continue with the rest of the procedure while performing Step 3.13.8.4.	The operator reads the Note, and proceeds to Step 3.13.8.4.		
18	(Step 3.13.8.4) Place Info Sticker on control switch for 1NI-430A stating: "Do NOT operate, N ₂ aligned to 1NC-34A for LTOP."	Cue: Another operator will fill out and place an Info Sticker for 1NI-430A		
		The operator acknowledges and proceeds to Step 3.13.9.5.		
19	(Step 3.13.8.5) Ensure 1NC-34A (Pzr PORV) in "Auto."	The operator observes that Control Switch for 1NC-34A is in AUTO.		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 Systems - Control Room JPM A

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A Unit 1 NC cooldown and depressurization is in progress in accordance with OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F).
- Enclosure 4.2 (Cooldown to 240°F (Control Room Activities)) is in progress.
- The 1A and 1B NCPs are operating.
- NC System pressure is 340 psig and NC System temperature is 310-320°F.
- NC Pressure control via normal spray and PZR heaters.
- NC pressure is being controlled using 1NC-29C, 1B NC Loop Pzr Spray Control, in MANUAL.
- Enclosure 4.1 of OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation) has been completed through Step 3.13 1.

INITIATING CUE:

The CRS has directed you to adjust NC System pressure per Step 3.3 of Enclosure 4.2 (Cooldown to 240°F (Control Room Activities)) of OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F). Then place the LTOP System in operation beginning with Step 3.13.2 - of Enclosure 4.1 of OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation) and monitor for proper operation.

Duke Energy
McGuire Nuclear Station
Controlling Procedure for LTOP Operation

Procedure No.

OP/1/A/6100/SO-10

Revision No.

032

Electronic Reference No.

MP00719P

Continuous Use

PERFORMANCE

***** UNCONTROLLED FOR PRINT *****

(ISSUED) - PDF Format

**Placing LTOP System in Service per
OP/1/A/6100/SD-4 (Cooldown to 240
Degrees F)**

1. Limits and Precautions

- 1.1 In "Low Press" Mode, Pzr PORVs 1NC-32B and 1NC-34A will open on NC System NR Pressure between 378 - 382 psig. NR Pressure is monitored by OAC Points M1A1359 (NC NR pressure for 1NC-32B actuation) and M1A1365 (NC NR pressure for 1NC-34A actuation).
- 1.2 PD Pump operation while in LTOP Mode is prohibited unless directed by an EP or AP. (overpressurization concern) {PIP 95-0541}
- 1.3 OP/1/A/6100/022 (Unit 1 Data Book) Enclosure 4.3, Curve 1.6b specifies the following for LTOP operation:
 - Heatup/cooldown rate limits
 - Indicated temperatures to be monitored (lowest of ND HX Outlet Temp or WR Cold Leg Temp)
 - Minimum temperatures below which NC Pumps must be secured
 - Minimum temperature below which immediate depressurization and establishing vent path must occur
- 1.4 **IF** any Pzr PORV secured open, LTOP heatup and cooldown rate limits are **NOT** applicable.
- 1.5 Per TS 3.4.12 (LTOP) Basis, for cases where no NC Pumps are operating, Tech Spec Required Actions for NCS cold leg temperature limits are met by monitoring both WR Cold Leg Temperatures and ND Hx Outlet Temperature.
- 1.6 **IF** indicated temperature (lowest of ND HX Outlet Temp or WR Cold Leg Temp) less than 74°F, a vent of greater than 2.75 square inches must be established and the system must remain depressurized. {PIP 00-3928}

2. Initial Conditions

- 2.1 Performance of this procedure has been directed by OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F) or OP/1/A/6100/003 (Controlling Procedure For Unit Operation).

Unit 1

Placing LTOP System in Service per
OP/1/A/6100/SD-4 (Cooldown to 240
Degrees F)

3. Procedure

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

NOTE: Steps 3.2 - 3.8 may be performed concurrently or in any order. {PIP 08-1227}

2K (3.2) Refer to TS 3.4.12 (Low Temperature Overpressure Protection (LTOP) System).

2K
SRO (3.3) Refer to TS 3.4.3 (RCS Pressure and Temperature (P/T) Limits).

CCC
AOM (3.4) Ensure there are no outstanding Work Orders that could affect LTOP operation.

AB
IAE (3.5) **IF** LTOP vent requirements are to be satisfied by 1NC-32B and 1NC-34A, ensure complete PT/1/A/4150/014 (PZR PORV LTOP Protection Analog Channel Operational Test (1NC34A, 1NC32B)).

- ☒ 3.6 Perform PT/1/A/4200/006 B (Boron Injection Valve Lineup Verification).

3.7 Ensure functional:

JW
IAE (3.8) 1NCPT-5122 (NC System Narrow Range Pressure Transmitter)

JW
IAE (3.9) 1NCPT-5142 (NC System Narrow Range Pressure Transmitter)

- ☒ 3.8 Connect laptop to monitor LTOP parameters per Enclosure 4.7 (LTOP Laptop Setup).

2K (3.9) Ensure functional operation of laptop connected to OAC NCLTOP.

NOTE: 1NC-36B (Unit 1 PZR PORV) is **NOT** required for LTOP operation. Stroking 1NC-36B (Unit 1 PZR PORV) at this time satisfies T.S. SR 3.4.11.2 for cycling each PORV during Mode 3 or Mode 4 with all NC Cold Legs temperatures greater than 300°F.

3/10 Perform the following:

☒ Stroke time test 1NC-32B (Unit 1 PZR PORV) per PT/1/A/4151/005 (NC Valve Stroke Timing Test Using Air), Enclosure 13.4

☒ Stroke time test 1NC-34A (Unit 1 PZR PORV) per PT/1/A/4151/005 (NC Valve Stroke Timing Test Using Air), Enclosure 13.5

☒ Stroke time test 1NC-36B (Unit 1 PZR PORV) per PT/1/A/4151/005 (NC Valve Stroke Timing Test Using Air), Enclosure 13.6

Placing LTOP System in Service per
OP/1/A/6100/SD-4 (Cooldown to 240
Degrees F)

28 3.11

WHEN T_{ave} less than 350°F **AND** all T_{colds} greater than 300°F, perform the following:

CAUTION:

To minimize the potential of a low temperature overpressure event by limiting mass input capability, Steps 3.11.1 - 3.11.4 must be completed prior to any T_{cold} decreasing to less than or equal to 300°F or performance Required Actions of TS 3.4.12 is required.

NOTE:

Placing "LTOP signs" can be performed concurrently with racking out and tagging of NV and NI Pump breakers.

3.11.1

Rack out and tag per OP/0/A/6350/008 (Operation of Station Breakers):

☐ 1ETA-10 (1A NV Pump)

OR

☒

1ETB-10 (1B NV Pump)

☒ 3.11.2

Rack out and tag 1ETA-9 (1A NI Pump) per OP/0/A/6350/008 (Operation of Station Breakers).

☒ 3.11.3

Rack out and tag 1ETB-9 (1B NI Pump) per OP/0/A/6350/008 (Operation of Station Breakers).

3.11.4

Place signs stating: "Unit 1 is in LTOP. DO NOT rack in unless directed by OP/1/A/6100/SO-10, PT/1/A/4200/009 A or PT/1/A/4200/009 B." on all of the following breaker cubicles: {CAPR PIP M09-5948}

☒ 1ETA-10 (1A NV Pump)☒ 1ETB-10 (1B NV Pump)☒ 1ETA-9 (1A NI Pump)☒ 1ETB-9 (1B NI Pump)

Unit 1

Enclosure 4.1

OP/1/A/6100/SO-10

Page 4 of 9

Placing LTOP System in Service per OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F)

2K 3.11.5
SRO

Designate an Operator capable of removing tag and racking in an NI Pump breaker within 15 minutes of dispatch (shutdown LOCA concern).

2K 3.11.5.1
SRO

Add item to SRO Turnover Checklist until no longer required.
(Less than 200°F per OP/1/A/6100/SD-12 (Cooldown to 100 Degrees F.)

3.11.5.2

The designated Operator is responsible for the following:

2K •

Ensure white tag, breaker procedure and PPE (clothing) staged to perform task immediately upon dispatch.

2K •

Ensure plant location and concurrent activities will **NOT** prevent completion of this activity within 15 minutes.

☒ 3.11.6

Tag open 1MXK-F2C (Reciprocating Charging Pump No 1).

☒ 3.11.7

Place sign stating: "Unit 1 is in LTOP. DO NOT close 1MXK-F2C" on 1MXK-F2C (Reciprocating Charging Pump No 1) breaker compartment. {PIP M09-5948}

NOTE:

Continue with rest of procedure while performing Step 3.11.8.

☒ 3.11.8

Place Info Stickers on Pzr PORV controls in Control Room and Aux Shutdown Panel stating: "Ensure all personnel in Pzr Cavity are notified prior to cycling." {PIP 99-1928}

N/A 3.12

IF LTOP vent requirements are to be satisfied by securing 1NC-36B (Pzr PORV) open, perform Enclosure 4.5 (Securing Pzr PORV(s) Open) for 1NC-36B.

2K 3.13

IF LTOP vent requirements are to be satisfied by 1NC-32B and 1NC-34A, perform the following:

3.13.1 **HOLD** until T_{ave} less than 320°F with all T_{colds} greater than 300°F.

3.13.2 Ensure in service:

- M1A1359 (NC NR pressure for 1NC-32B actuation)
- M1A1365 (NC NR pressure for 1NC-34A actuation)

3.13.3 Monitor:

- ☐ M1A1359 (NC NR pressure for 1NC-32B actuation)
- ☐ M1A1365 (NC NR pressure for 1NC-34A actuation)

Unit 1

Enclosure 4.1

Placing LTOP System in Service per OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F)

OP/1/A/6100/SO-10

Page 5 of 9

3.13.4 Ensure the following for A Cold Leg Accumulator:

- ☐ • Pressure greater than 200 psig
- ☐ • Level less than 38.7% (7342 gallons maximum)

3.13.5 Ensure the following for B Cold Leg Accumulator:

- ☐ • Pressure greater than 200 psig
- ☐ • Level less than 38.7% (7342 gallons maximum)

3.13.6 Ensure open:

- ☐ • 1NC-31B (Pzr PORV Isol)
- ☐ • 1NC-33A (Pzr PORV Isol)

NOTE: For NC Loop in which an NC Pump is operating, NR pressure may indicate up to 20 psig higher than NR pressure for NC Loop in which an NC Pump is **NOT** operating.

☐ 3.13.7 **WHEN** M1A1359 indicates 320 - 330 psig, perform the following:

☐ 3.13.7.1 Select "LOW PRESS" on "PORV Overpress Protection Select 1NC-32B".

☐ 3.13.7.2 Check lit 1AD-6, F10 (PORV NC-32B Emerg CLA N₂ Enabled).

☐ ☐ 3.13.7.3 Ensure open 1NI-431B (Emerg N₂ from CLA to 1NC-32B & 36B).

cv

NOTE: Continue with rest of procedure while performing Step 3.13.7.4.

☐ 3.13.7.4 Place Info Sticker on control switch for 1NI-431B stating:
"Do **NOT** operate, N₂ aligned to 1NC-32B for LTOP."

☐ 3.13.7.5 Ensure 1NC-32B (Pzr PORV) in "AUTO".

Unit 1

**Placing LTOP System in Service per
OP/1/A/6100/SD-4 (Cooldown to 240
Degrees F)**

_____ 3.13.8 **WHEN** M1A1365 indicates 320 - 330 psig, perform the following:

_____ 3.13.8.1 Select "LOW PRESS" on "PORV Overpress Protection Select 1NC-34A".

☐ 3.13.8.2 Check lit 1AD-6, F9 (PORV NC-34A Emerg CLA N₂ Enabled).

_____ 3.13.8.3 Ensure open 1NI-430A (Emerg N₂ from CLA to 1NC-34A).
_____ CV

NOTE: Continue with rest of procedure while performing Step 3.13.8.4.

☐ 3.13.8.4 Place Info Sticker on control switch for 1NI-430A stating:
"Do **NOT** operate, N₂ aligned to 1NC-34A for LTOP."

_____ 3.13.8.5 Ensure 1NC-34A (Pzr PORV) in "AUTO".

3.13.9 Check Cold Leg Accumulators isolated as follows:

3.13.9.1 Check closed:

- ☐ 1NI-54A (A CL Accum Disch Isol)
- ☐ 1NI-65B (B CL Accum Disch Isol)
- ☐ 1NI-76A (C CL Accum Disch Isol)
- ☐ 1NI-88B (D CL Accum Disch Isol)

3.13.9.2 Check in "DISCON":

- ☐ "1NI-54A Power Disconnect"
- ☐ "1NI-65B Power Disconnect"
- ☐ "1NI-76A Power Disconnect"
- ☐ "1NI-88B Power Disconnect"

_____ 3.13.9.3 **IF** any CLA discharge isolation valve open, check the following:

- _____ • Associated CLA pressure less than current NC System pressure
- _____ • Associated CLA pressure less than allowable NC System pressure for current Cold Leg temperature per TS 3.4.3

**Placing LTOP System in Service per
OP/1/A/6100/SD-4 (Cooldown to 240
Degrees F)**

3.14 Monitor LTOP System operation as follows:

- ☐ 3.14.1 Refer to OP/1/A/6100/022 (Unit 1 Data Book), Enclosure 4.3, Curve 1.6b for LTOP Heatup and Cooldown Rate Limits.
- 3.14.2 During LTOP System operation, ROs are responsible for the following:
 - ☐ Recording LTOP Heatup or Cooldown Rate Data in Table 4.1-1 every 6 hours
 - ☐ Monitoring and controlling NC System pressure, temperature and inventory
 - ☐ Preventing a low temperature overpressure condition in NC System

NOTE: The Reactor Vessel Head may be considered removed when it is being suspended for the Polar Crane Load Test.

- ☐ 3.14.3 **IF** Reactor Vessel Head removed, perform the following:
 - ☐ 3.14.3.1 Remove Info Sticker on control switch for 1NI-430A stating: "Do **NOT** operate, N₂ aligned to 1NC-34A for LTOP."
 - ☐ 3.14.3.2 Remove Info Sticker on control switch for 1NI-431B stating: "Do **NOT** operate, N₂ aligned to 1NC-32B for LTOP."
 - 3.14.3.3 Discontinue recording parameters in Table 4.1-1 by performing the following:
 - ☐ A. Record Date and Time Reactor Vessel Head removed.
 - ☐ B. State "Reactor Vessel Head removed, LTOP System **NOT** required".
 - ☐ C. Exit this procedure.

Enclosure 4.1

Placing LTOP System in Service per OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F)

OP/1/A/6100/SO-10

Page 8 of 9

- _____ 3.15 **IF** desired to establish an alternate NC System vent path, perform Enclosure 4.4 (Establishing Alternate NC System Vent Path).
- _____ 3.16 **IF** desired to secure a PORV open, perform Enclosure 4.5 (Securing Pzr PORV(s) Open).
- _____ 3.17 **IF** desired to rack in an additional NI or NV pump, perform Enclosure 4.6 (Making Two NI or NV Pumps Capable of Mass Addition).
- _____ 3.18 **WHEN** directed by Enclosure 4.3 (Removing LTOP System From Service) to discontinue recording parameters in Table 4.1-1, exit this enclosure.

SIM JPM B

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Manually Align Phase B HVAC EquipmentJPM No.: 2011 Systems - Control Room JPM B

K/A Reference: 028, A4.01 (4.0/4.0)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: X

Classroom _____

Simulator _____

X

Plant _____

READ TO THE EXAMINEE

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

Initial Conditions:

- You are the Unit 2 BOP.
- Unit 1 has experienced a Large Break LOCA.
- The crew is implementing EP/1/A/5000/E-0 (Reactor Trip or Safety Injection).

Task Standard:

The operator manually starts both Trains of the VE and VX Systems.

Required Materials:

None

General References:

EP/1/A/5000/E-0 (Reactor Trip or Safety Injection), Rev 31

Handouts:

Enclosure 2 (Phase B HVAC Equipment) of EP/1/A/5000/E-0 (Reactor Trip or Safety Injection).

Initiating Cue:

The CRS has directed you to check Phase B HVAC equipment in accordance with Enclosure 2, (Phase B HVAC Equipment), of EP/1/A/5000/E-0, (Reactor Trip or Safety Injection).

what

Time Critical Task:

NO

Job Performance Measure Worksheet

Validation Time: 5 minutes

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset to IC # 39, 100% Power, MOL. Go to RUN.
2. Insert:
 - a. MALF-NC008A Large Break LOCA on Trigger 1.
 - b. MALF-ISE004A (Both) Failure of Train A of Phase B Containment Isolation
MALF-ISE004B (Both) Failure of Train B of Phase B Containment Isolation
3. Actuate Trigger 1
4. Perform steps 1 through 15.h of EP/1/A/5000/E-0 (Including manual actions to overcome failure of Containment Phase B Isolation).
5. Freeze Simulator.

OR

1. Reset Simulator to Temporary Snap IC-251 (March, 2011).
2. Momentarily go to RUN to acknowledge Alarms then place Simulator in FREEZE.
3. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: FWST level is depleting rapidly and could interfere with the performance of this JPM.

If the FWST level drops low enough to require CLR switchover the Simulator Instructor should silence the alarm.

The operator will NOT be expected to respond to this alarm.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 2 of EP/1/A/5000/E-0.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Steps 1/1.a) Check VE System in operation as follows: VE Fans – ON.	<p>The operator observes the 1A VE Fan Green status light LIT, and Red status light OFF and determines that the fan is OFF.</p> <p>The operator observes the 1B VE Fan Green status light LIT, and Red status light OFF and determines that the fan is OFF.</p>		
*2	<p>(Steps 1.a RNO a.1-2) Start fans as follows:</p> <p>1 Select "ON".</p> <p>1 Return switch to "AUTO".</p> <p><i>Which one is critical?</i></p>	<p>The operator places the 1A VE Fan control switch to ON, and observes the Red status light LIT, Green status light OFF.</p> <p>The operator returns the 1A VE Fan control switch to AUTO.</p> <p>The operator places the 1B VE Fan control switch to ON, and observes the Red status light LIT, Green status light OFF.</p> <p>The operator returns the 1B VE Fan control switch to AUTO.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	<p>(Step 1.b) Ensure all damper mode select switches in "AUTO":</p> <p>1AVS-D-7 Mode Select</p> <p>1AVS-D-8 Mode Select</p> <p>1AVS-D-2 Mode Select</p> <p>1AVS-D-3 Mode Select.</p>	<p>The operator observes that the 1AVS-D-7 Mode Select Switch is in AUTO.</p> <p>The operator observes that the 1AVS-D-8 Mode Select Switch is in AUTO.</p> <p>The operator observes that the 1AVS-D-2 Mode Select Switch is in AUTO.</p> <p>The operator observes that the 1AVS-D-3 Mode Select Switch is in AUTO.</p>		
4	(Step 1.c) Annulus pressure being maintained - NEGATIVE.	The operator observes 1VEP-5100 and 1VEP-5110 are indicating -3" water column and determines that the Annulus pressure is negative.		
5	(Steps 2/2.a) Check VX System in operation as follows: Time since Phase B actuation - GREATER THAN 10 MINUTES.	<p>After the cue, the operator recognizes that the time since Phase B actuation is greater than 10 minutes and proceeds to Step 2.b.</p> <p>Cue:</p> <p>Phase B Isolation on Unit 1 actuated 12 minutes ago.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	<p>(Step 2.b) Check the following - OPEN:</p> <p>1RAF-D-4 (1B Cont Air Ret Fan To Lwr Cont Test A)</p> <p>1VX-2B (1B H2 Skimmer Fan Isol Test A)</p> <p>1RAF-D-2 (1A Cont Air Ret Fan To Lwr Cont Test A)</p> <p>1VX-1A (1A H2 Skimmer Fan Isol Test A).</p>	<p>The operator observes that the 1RAF-D-4 Green status light is LIT, Red status light is OFF.</p> <p>The operator observes that the 1VX-2B Green status light is LIT, Red status light is OFF.</p> <p>The operator observes that the 1RAF-D-2 Green status light is LIT, Red status light is OFF.</p> <p>The operator observes that the 1VX-1A Green status light is LIT, Red status light is OFF.</p>		
*7	(Step 2.b RNO) open dampers.	<p>The operator presses the 1RAF-D-4 OPEN pushbutton and observes the Red status light is LIT, Green status light is OFF.</p> <p>The operator presses and holds the 1VX-2B OPEN pushbutton and observes the Red status light is LIT, Green status light is OFF.</p> <p>The operator presses the 1RAF-D-2 OPEN pushbutton and observes the Red status light is LIT, Green status light is OFF.</p> <p>The operator presses and holds the 1VX-1A OPEN pushbutton and observes the Red status light is LIT, Green status light is OFF.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
8	(Step 2.c) Check Containment Air Return fans - ON.	<p>The operator observes the 1A CAR Fan Green status light LIT, and Red status light OFF.</p> <p>The operator observes the 1B CAR Fan Green status light LIT, and Red status light OFF.</p>		
*9	(Step 2.c RNO) start fans.	<p>The operator depresses the START pushbutton for the 1A CAR Fan, and observes the Red status light LIT, Green status light OFF.</p> <p>The operator depresses the START pushbutton for the 1B CAR Fan, and observes the Red status light LIT, Green status light OFF.</p>		
10	(Step 2.d) Check H ₂ Skimmer fans - ON.	<p>The operator observes the 1A H₂ Skimmer Fan Green status light LIT, and Red status light OFF.</p> <p>The operator observes the 1B H₂ Skimmer Fan Green status light LIT, and Red status light OFF.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*11	(Step 2.d RNO) start fans.	<p>The operator depresses the START pushbutton for the 1A H₂ Skimmer Fan, and observes the Red status light LIT, Green status light OFF.</p> <p>The operator depresses the START pushbutton for the 1B H₂ Skimmer Fan, and observes the Red status light LIT, Green status light OFF.</p>		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- You are the Unit 2 BOP.
- Unit 1 has experienced a Large Break LOCA.
- The crew is implementing EP/1/A/5000/E-0 (Reactor Trip or Safety Injection).

INITIATING CUE:

The CRS has directed you to check Phase B HVAC equipment in accordance with Enclosure 2, (Phase B HVAC Equipment), of EP/1/A/5000/E-0, (Reactor Trip or Safety Injection).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

1. **Check VE System in operation as follows:**

___ a. VE Fans - ON.

a. Start fans as follows:

___ 1) Select "ON".

___ 2) Return switch to "AUTO".

b. Ensure all damper mode select switches in "AUTO":

___ • 1AVS-D-7 Mode Select

___ • 1AVS-D-8 Mode Select

___ • 1AVS-D-2 Mode Select

___ • 1AVS-D-3 Mode Select.

___ c. Annulus pressure being maintained -
NEGATIVE.

___ c. Notify station management.

2. **Check VX System in operation as follows:**

___ a. Time since Phase B actuation -
GREATER THAN 10 MINUTES.

___ a. WHEN 10 minutes has expired, THEN
perform rest of this enclosure.

b. Check the following - OPEN:

___ b. OPEN dampers.

___ • 1RAF-D-4 (1B Cont Air Ret Fan To
Lwr Cont Test A)

___ • 1VX-2B (1B H2 Skimmer Fan Isol
Test A)

___ • 1RAF-D-2 (1A Cont Air Ret Fan To
Lwr Cont Test A)

___ • 1VX-1A (1A H2 Skimmer Fan Isol
Test A).

___ c. Check Containment Air Return fans -
ON.

___ c. Start fans.

___ d. Check H2 Skimmer fans - ON.

___ d. Start fans.

SIM JPM C

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Emergency Borate the RCSJPM No.: 2011 Systems - Control
Room JPM C
(Alternate Path)

K/A Reference: 004 A4.18, 4.3/4.1

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: XClassroom _____ Simulator X Plant _____**READ TO THE EXAMINEE**

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

Initial Conditions:

- With the plant at power, a Reactor Makeup System failure has resulted automatic Control Rod insertion.
- MCB Annunciator 1AD-2, A9, CONTROL ROD BANK LO LIMIT, has alarmed.
- The crew has entered AP/1/A/5500/38 (Emergency Boration) and completed the procedure through Step 11.
- The 1B BA Transfer Pump is OOS.

Task Standard: The operator establishes Emergency Boration flow from the FWST.

Required Materials: None

General References: OP/1/A/6100/010 C (Annunciator Response for Panel 1AD-2), Rev. 61
AP/1/A/5500/38 (Emergency Boration), Rev. 10

Handouts: AP/1/A/5500/38 (Emergency Boration), marked up through Step 11.

Initiating Cue: The CRS has directed you to initiate Emergency Boration starting with Step 12 of AP/1/A/5500/38 (Emergency Boration).

Job Performance Measure Worksheet

Time Critical Task: No

Validation Time: 5 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset to IC-39 (100% Steady-state)
2. Place Simulator in Run and acknowledge Annunciator Alarms.
3. Enter MALF-NC001 = 1010, ramped at 180 seconds, and allow Controls Rods to auto insert until MCB Annunciator 1AD-2, A9, has alarmed.
4. Stabilize plant at < 100% power (NOTE; AFD is NOT within Spec).
5. Insert the following:
 - LOA-NV044, BORIC ACID XFR PUMP 1B RACKOUT (Control Switch in STOP)
 - MALF-NV12, Plugged BA Filter = 100
6. Place the 1A BA Transfer Pump Control Switch in AUTO with Pump OFF.
7. Perform Steps 1-11 of AP/1/A/5500/38.
8. Acknowledge alarms and Freeze the Simulator.

OR

1. Reset Simulator to Temporary Snap IC-252 (March, 2011)
2. Place Red Tag Sticker on 1B Boric Acid Transfer Pump.
3. Momentarily place Simulator in Run for **at LEAST 30 seconds** to acknowledge alarms.
4. Leave Simulator in FREEZE until operator is ready to begin.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout AP/1/A/5500/38 marked up through Step 11.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Step 12) Initiate emergency boration as follows: (Step 12.a) Check 1A or 1B NV pump- AVAILABLE	The operator observes Red status light LIT, Green status light OFF for the 1B NV Pump.		
2	(Step 12.b) Check any NV pump-ON.	The operator observes Red status light LIT, Green status light OFF for the 1B NV Pump, and that amperage is at normal running amps.		
3	(Step 12.c) Check the following boric acid system component – AVAILABLE. Boric Acid Storage Tank Boric Acid Transfer pump.	The operator observes 1NVP-5740 and determines that 1 BAT level is 82%. (Or equivalent, i.e. observes the OAC) The operator observes 1NVP-6070 and determines that 2 BAT level is 80%. (Or equivalent, i.e. observes the OAC) The operator observes Green status light LIT, Red status light OFF for the 1A BA Transfer Pump.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	(Step 12.d) OPEN 1NV-265B (Boric Acid to NV Pumps).	The operator presses the OPEN pushbutton for 1NV-265B, and observes Red status light LIT, Green status light OFF.		
5	(Step 12.e) Ensure a boric acid transfer pump is running.	The operator rotates the Control Switch to START for the 1A BA Transfer Pump, and observes Red status light LIT, Green status light OFF.		
		NOTE: The BA Filter is plugged and therefore, there will be no flow indicated in the NEXT Step.		
6	(Step 12.f) Check boration flow using one of the following methods: IF 1NV-265B is open, THEN check "EMERGENCY BORATION FLOW" – ESTABLISHED.	The operator observes 1NVP-5440 (Or equivalent, i.e. OAC) observes 5 gpm, and determines that Emergency Boration Flow is NOT established, and proceeds to RNO. (ALTERNATE PATH)		
7	(Step 12.f RNO) Perform the following: (Step 12.f RNO 1) Start second boric acid transfer pump.	The operator recognizes that the 1B BA Transfer Pump is OOS, and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*8	<p>(Step 12.f RNO 2) IF boration flow cannot be established, THEN align NV pump suction to FWST as follows:</p> <p>(Step 12.f RNO 2.a) OPEN the following valves:</p> <p>1NV-221A (NV Pumps Suct From FWST)</p> <p>1 NV-222B (NV Pumps Suct From FWST).</p>	<p>The operator presses the OPEN pushbutton for 1NV-221A, and observes Red status light LIT, Green status light OFF.</p> <p>The operator presses the OPEN pushbutton for 1NV-222B, and observes Red status light LIT, Green status light OFF.</p> <p>NOTE:</p> <p>One of the two valves must be open to satisfy the Critical nature of the step.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*9	<p>(Step 12.f RNO 2.b) CLOSE the following valves:</p> <p>1NV-141A (VCT Outlet Isol)</p> <p>1NV-142B (VCT Outlet Isol).</p>	<p>The operator presses the CLOSE pushbutton for 1NV-141A, and observes Green status light LIT, Red status light OFF.</p> <p>The operator presses the CLOSE pushbutton for 1NV-142B, and observes Green status light LIT, Red status light OFF.</p> <p>NOTE:</p> <p>One of the two valves must be open to satisfy the Critical nature of the step.</p>		
10	(Step 12.f RNO 2.c) GO TO Step 15	The operator proceeds to Step 15.		
11	<p>(Step 15) Align Normal Charging flowpath as follows:</p> <p>(Step 15.a) Ensure one of the following NC loop isolation valves is OPEN:</p> <p>1NV-13B (NV Supply to A NC Loop Isol)</p> <p>OR</p> <p>1NV-16A (NV Supply to D NC Loop Isol).</p>	The operator observes the 1NV-13B Red status light LIT, Green status light OFF.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
12	(Step 15.b) Check both of the following valves- OPEN: 1NV-224A (Charging Line Cont Outside Isol) 1NV-245B (Charging Line Cont Outside Isol).	The operator observes the 1NV-224A Red status light LIT, Green status light OFF. The operator observes the 1NV-245B Red status light LIT, Green status light OFF.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 Systems - Control Room JPM C

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- With the plant at power, a Reactor Makeup System failure has resulted automatic Control Rod insertion.
- MCB Annunciator 1AD-2, A9, CONTROL ROD BANK LO LIMIT, has alarmed.
- The crew has entered AP/1/A/5500/38 (Emergency Boration) and completed the procedure through Step 11.
- The 1B BA Transfer Pump is OOS.

INITIATING CUE:

The CRS has directed you to initiate Emergency Boration starting with Step 12 of AP/1/A/5500/38 (Emergency Boration).

Duke Energy
PROCEDURE PROCESS RECORD

(1) ID No. AP/1/A/5500/038
Revision No. 010

INFORMATION ONLY

REPARATION

(2) Station McGuire Nuclear Station

(3) Procedure Title Emergency Boration And Response To Inadvertent Dilution

(4) Prepared By Crump, Gerald W *Gerald W Crump* Date March 25, 2010

(5) Requires NSD 228 Applicability Determination?

- ☒ Yes (New procedure or revision with major changes) - Attach NSD 228 documentation
☐ No (Revision with minor changes)

(6) Reviewed By *[Signature]* (QR) (KI) Date 3/31/10

Cross-Disciplinary Review By NA (QR) (KI) Date 3/31/10

Reactivity Mgmt. Review By *[Signature]* (QR) NA Date 3/31/10

Mgmt. Involvement Review By NA (OPS Supt.) NA Date 3/31/10

(7) Additional Reviews

Reviewed By _____ Date _____

Reviewed By _____ Date _____

(8) Approved By *[Signature]* Date 3/31/10

PERFORMANCE (Compare with Control Copy every 14 calendar days while work is being performed.)

9) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(10) Date(s) Performed _____

Work Order Number (WO#) _____

COMPLETION

(11) Procedure Completion Verification:

- ☐ Yes ☐ NA Checklists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
☐ Yes ☐ NA Required enclosures attached?
☐ Yes ☐ NA Charts, graphs, data sheets, etc. attached, dated, identified, and marked?
☐ Yes ☐ NA Calibrated Test Equipment, if used, checked out/in and referenced to this procedure?
☐ Yes ☐ NA Procedure requirements met?

Verified By _____ Date _____

(12) Procedure Completion Approved _____ Date _____

(13) Remarks (Attach additional pages, if necessary)

A. Purpose

To provide guidance on methods of rapidly injecting boric acid into the NC System and to provide appropriate actions to stop an uncontrolled NC System boron dilution.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

B. Symptoms

- Excessive control rod insertion
- Failure of two or more control rods to drop following a reactor trip
- NC T-Avg going up in an uncontrolled manner
- Steam pressure going up in an uncontrolled manner
- Reactor power going up in an uncontrolled manner
- Inadequate shutdown margin
- "CONTROL ROD BANK LO LIMIT" alarm
- "CONTROL ROD BANK LO LO LIMIT" alarm
- Less than the minimum Mode 6 boron concentration
- "S/R HI FLUX AT SHUTDOWN" alarm
- Neutron count rate going up
- Emergency boration per this AP has been specified by another procedure.

C. Operator Actions

- ✓ 1. Check if boron dilution - SUSPECTED. GO TO Step 9.
- ✓ 2. Maintain reactor power less than or equal to 100%.
- ✓ 3. Announce occurrence on paging system.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4. Isolate reactor makeup water to VCT as follows:

- ☒ a. Ensure both reactor makeup water pumps are off.
- ☒ b. Select "CLOSE" on the following valve switches:
 - ☒ • 1NV-171A (BA Blender To VCT Inlet)
 - ☒ • 1NV-175A (BA Blender to VCT Outlet)
 - ☒ • 1NV-252A (Rx M/U Water To Blender Control).

☒ 5. Check reactor status at time of dilution - CRITICAL.

IF any control rod withdrawn, THEN perform the following:

- ☐ a. Trip reactor.
- ☐ b. **IF** above P-11, **THEN** perform the following:
 - ☐ 1) Have another operator continue with this procedure.
 - ☐ 2) **GO TO** EP/1/A/5000/E-0 (Reactor Trip or Safety Injection).

☒ 6. Place 1NV-127A (L/D Hx Outlet 3-Way Temp Cntrl) in the "VCT" position.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

7. Notify OSM or another SRO to perform the following while continuing with this procedure:

- Evaluate ongoing or recent plant evolutions for potential dilution sources.

N/A IF source of dilution cannot readily be determined or isolated, **THEN** perform the following:

- a. Evaluate dispatching an operator to CLOSE 1NB-256 (Unit 1 RMWST Outlet Isol) (East Side of RMWST, 760+2).
- b. IF 1NB-256 is closed, **THEN** notify Radwaste Chemistry the Reactor Makeup Water flush header is isolated.

8. Check unit status - IN MODE 1 OR 2.

Perform the following:

- a. IF in Mode 6, **THEN** dispatch operator to ensure 1NV-250 (Rx Makeup Water Supply to Unit 1 NV Isol) (aux bldg, 733, JJ-54, 25 ft north of KC pumps) is CLOSED.
- b. IF fuel handling activities in progress, **THEN** stop fuel handling **PER** Enclosure 2 (Actions To Stop Fuel Handling).
- c. Evaluate need to evacuate Containment **PER** RP/0/A/5700/011 (Conducting a Site Assembly, Site Evacuation, or Containment Evacuation).
- d. Evaluate stopping any heatup or cooldown in progress to minimize reactivity changes.
- e. **GO TO** Step 12.

- N* 9. Check if load reduction - HAS OCCURRED. →

→ **GO TO** Step 11.!

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

10. Do not continue unless one of the following is met:

- Emergency boration is specified by an abnormal or emergency procedure.

OR

- Boron dilution is suspected.

11. Check "CONTROL ROD BANK LO LIMIT" alarm (1AD-2, A-9) - LIT.

Perform the following:

- a. Borate as necessary to restore control rods to desired height PER OP/1/A/6150/009 (Boron Concentration Control).
- b. IF AT ANY TIME a higher boration flowrate is desired OR "CONTROL ROD BANK LO LIMIT" alarm (1AD-2, A-9) lit, THEN GO TO Step 12.
- c. GO TO Step 21.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

12. Initiate emergency boration as follows:

- ___ a. Check 1A or 1B NV pump -
AVAILABLE.

- a. IF NI pump being used to provide
required boron injection flowpath, THEN
perform the following:

- 1) Ensure the following valves OPEN:

- ___ • 1NI-100B (FWST To NI Pumps)
- ___ • 1NI-162A (NI Pumps Cold Leg
Isol).

- 2) IF 1A NI pump available, THEN
perform the following:

- a) Ensure the following valves
OPEN:

- ___ • 1NI-103A (A NI Pump Suct
From FWST)
- ___ • 1NI-118A (Train A NI To Cold
Leg Isol).

- ___ b) Start 1A NI pump.

- 3) IF 1B NI pump available, THEN
perform the following:

- a) Ensure the following valves
OPEN:

- ___ • 1NI-135B (B NI Pump Suct
From FWST)
- ___ • 1NI-150B (Train B NI To Cold
Leg Isol).

- ___ b) Start 1B NI pump.

- 4) WHEN emergency boration no
longer required, THEN perform the
following:

- ___ a) Stop running NI pump.
- ___ b) Align above NI valves to original
position.
- ___ c) IF AT ANY TIME emergency
boration is required, THEN
RETURN TO Step 12.a.

- ___ 5) GO TO Step 23.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

12. (Continued)

___ b. Check any NV pump - ON.

b. Perform the following:

- ___ 1) Ensure suction flow path aligned.
- ___ 2) Ensure the following valves are OPEN:
 - ___ • 1NV-150B (NV Pumps Recirculation)
 - ___ • 1NV-151A (NV Pumps Recirculation).
- ___ 3) CLOSE 1NV-238 (Charging Line Flow Control).
- ___ 4) Start NV pump.

c. Check the following boric acid system components - AVAILABLE.

- ___ • Boric Acid Storage Tank
- ___ • Boric Acid Transfer pump.

c. Align NV pump suction to FWST as follows:

- ___ 1) OPEN the following valves:
 - ___ • 1NV-221A (NV Pumps Suct From FWST)
 - ___ • 1NV-222B (NV Pumps Suct From FWST).
- ___ 2) CLOSE the following valves:
 - ___ • 1NV-141A (VCT Outlet Isol)
 - ___ • 1NV-142B (VCT Outlet Isol).
- ___ 3) GO TO Step 15.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

12. (Continued)

- ___ d. OPEN 1NV-265B (Boric Acid To NV Pumps).

- d. Perform the following:

- ___ 1) Dispatch operator to OPEN 1NV-265B (aux bldg, 733+3, JJ-54, near chemical addition tank).
- ___ 2) **IF** 1NV-265B cannot be opened, **THEN** perform the following:
- ___ a) Dispatch operator to unlock and OPEN 1NV-269 (Unit 1 NV Pump Boric Acid Supply Isol (Emergency Boration Valve)) (aux bldg, 733+4, JJ-54, near chemical addition tank).
- ___ b) OPEN 1NV-267A (Boric Acid To Blender Control).
- ___ 3) Do not continue until 1NV-265B or 1NV-269 flowpath above is aligned.

- ___ e. Ensure a boric acid transfer pump is running.

- f. Check boration flow using one of the following methods:

- ___ • **IF** 1NV-265B is open, **THEN** check "EMERGENCY BORATION FLOW" - ESTABLISHED.

OR

- ___ • **IF** 1NV-269 is open, **THEN** check "BORIC ACID FLOW" on chart recorder 1MNVCR5450 - ESTABLISHED.

- f. Perform the following:

- ___ 1) Start second boric acid transfer pump.
- ___ 2) **IF** boration flow cannot be established, **THEN** align NV pump suction to FWST as follows:
- ___ a) OPEN the following valves:
- ___ • 1NV-221A (NV Pumps Suct From FWST)
- ___ • 1NV-222B (NV Pumps Suct From FWST).
- ___ b) CLOSE the following valves:
- ___ • 1NV-141A (VCT Outlet Isol)
- ___ • 1NV-142B (VCT Outlet Isol).
- ___ c) **GO TO** Step 15.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

___ 13. **IF AT ANY TIME** boration no longer required, **THEN GO TO** Step 20.

14. **IF AT ANY TIME** a higher boration flowrate is desired, **THEN** evaluate performing the following as required:

___ • Start a second boric acid transfer pump.

___ • Align NV pump suction to FWST as follows:

a. OPEN the following valves:

___ • 1NV-221A (NV Pumps Suct From FWST)

___ • 1NV-222B (NV Pumps Suct From FWST).

b. CLOSE the following valves:

___ • 1NV-141A (VCT Outlet Isol)

___ • 1NV-142B (VCT Outlet Isol).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15. **Align Normal Charging flowpath as follows:**

- a. Ensure one of the following NC loop isolation valves is OPEN:

___ • 1NV-13B (NV Supply To A NC Loop Isol)

OR

___ • 1NV-16A (NV Supply To D NC Loop Isol).

- b. Check both of the following valves - OPEN:

___ • 1NV-244A (Charging Line Cont Outside Isol)

___ • 1NV-245B (Charging Line Cont Outside Isol).

- b. Perform the following:

___ 1) CLOSE 1NV-241 (U1 Seal Water Inj Flow Control).

___ 2) OPEN 1NV-244A.

___ 3) OPEN 1NV-245B.

___ 4) Slowly THROTTLE OPEN 1NV-238 (Charging Line Flow Control) and 1NV-241 to establish desired charging and seal injection flow:

___ 5) **IF** charging flow cannot be established, **THEN GO TO** Enclosure 1 (Establishing Alternate Boration Flowpath).

16. **Establish desired charging flowrate to the NC System as follows:**

___ a. THROTTLE OPEN 1NV-238 (Charging Line Flow Control) and 1NV-241 (U1 Seal Water Inj Flow Control) to establish desired charging flow, not to exceed 200 GPM.

___ b. **IF** required to compensate for higher charging flowrate, **THEN** raise letdown to a maximum of 120 GPM.

SIM JPM D

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Establish NC System Feed and BleedJPM No.: 2011 Systems - Control Room JPM D
(Alternate Path)

K/A Reference: EPE E05, EA1.1, 4.1/4.0

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: XClassroom _____ 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:
- A Reactor Trip on Lo-Lo S/G Level has occurred due to the loss of both Main Feedwater Pumps.
 - The CA System will not start.
 - EP/1/A/5000/FR-H.1 (Loss of Secondary Heat Sink) has been implemented.
 - Feed and Bleed initiation criteria has been met.

Task Standard: The operator establishes an RCS feed and bleed flowpath such that all NCP's off, flow is High Pressure Injection flow is established through NI-9/10, both Pzr PORVs are open, and both NV Pump Recirculation Valves are closed within 5 minutes of the first Pzr PORV being opened.

Required Materials: None

General References: EP/1/A/5000/FR-H.1 (Loss of Secondary Heat Sink), Rev. 15
PT/0/A/4600/113 (Operator Time Critical Task Verification), Enclosure 13.10 (Initiate Feed and Bleed Once Criteria Met), Rev 16.

Handouts: EP/1/A/5000/FR-H.1 (Loss of Secondary Heat Sink) marked up for place-keeping through Step 3.

Job Performance Measure Worksheet

Initiating Cue: The CRS has directed you to initiate an NC System Feed and Bleed by performing Steps 22 - 28 of EP/1/A/5000/FR-H.1 (Loss of Secondary Heat Sink).

This is a TIME CRITICAL JPM.

Time Critical Task: YES - The NV Recirc Valve must be closed within **five minutes** of initiating feed and bleed. Although this action is NOT required for a design basis event, this item is included due to its PRA significance during a loss of secondary heat sink event.

Validation Time: 5 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset to IC-39, 100%, MOL.
2. Insert the following malfunctions:
 - IPE001A, Reactor fails to trip in AUTO, Train A
 - IPE001B, Reactor fails to trip in AUTO, Train B
 - DEH003A, Turbine fails to trip in AUTO
 - CA004A, MDCA Pump A fails to start
 - CA004B, MDCA Pump B fails to start
 - CA005, TDCA Pump fails to start
 - NI009A, 1NI-9A Fails to Open Automatically
 - NI009B, 1NI-10B Fails to Open Automatically
3. Place Simulator in Run and acknowledge Annunciator Alarms.
4. Manually Trip both Feed Pumps.
5. Allow at least 3 S/G's to decrease below 24% WR level.
6. Manually trip the reactor and turbine
7. Ensure that EP/1/A/5000/FR-H.1 is completed through Step 5. (E-0 to FR-S.1 to FR-H.1)
8. Freeze the Simulator.

OR

1. Reset Simulator to Temporary Snap IC-253 (March, 2011)
2. Momentarily place Simulator in Run to acknowledge alarms.
3. Leave Simulator in FREEZE until operator is ready to begin.

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-H.1 marked up for place-keeping through Step 3.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Step 22) Perform Steps 23 through 27 quickly to establish NC heat removal by NC feed and bleed.	The operator reads the step and proceeds.		
*2	(Step 22) Ensure all NC Pumps – OFF.	<p>The operator presses the STOP pushbutton for the 1A NCP Pump and observes the Green status light is LIT, and Red status light is OFF.</p> <p>The operator presses the STOP pushbutton for the 1B NCP Pump and observes the Green status light is LIT, and Red status light is OFF.</p> <p>The operator presses the STOP pushbutton for the 1C NCP Pump and observes the Green status light is LIT, and Red status light is OFF.</p> <p>The operator presses the STOP pushbutton for the 1D NCP Pump and observes the Green status light is LIT, and Red status light is OFF.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(Step 24) Initiate S/I.	The operator presses the S/I INITIATE pushbuttons for Train A and Train B, and observes that the SI Actuation status light is LIT.		
4	(Step 25) Check "NV PMPS TO COLD LEG FLOW" – INDICATING FLOW.	The operator observes NI-1NVP-6080 at 0 gpm, and determines that there is NO flow from the NV Pumps, and proceeds to the Step 25 RNO. (Alternate Path)		
		NOTE: The operator may observe that 1NI-9A and 10B should have opened but did NOT, and open them. If so, proceed to JPM Step 11 (Procedure Step 26).		
5	(Step 25 RNO) Perform the following: (Step 25 RNO a) Start NV Pumps.	The operator observes the 1A NV Pump Red status light is LIT, green status light is OFF, and amperage indicated, and determines that the 1A NV Pump is running. The operator observes the 1B NV Pump Red status light is LIT, green status light is OFF, and amperage indicated, and determines that the 1B NV Pump is running.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	(Step 25 RNO b) Start NI Pumps.	<p>The operator observes the 1A NI Pump Red status light is LIT, green status light is OFF, and amperage indicated, and determines that the 1A NI Pump is running.</p> <p>The operator observes the 1B NI Pump Red status light is LIT, green status light is OFF, and amperage indicated, and determines that the 1B NI Pump is running.</p>		
7	(Step 25 RNO c) OPEN the following valves: <ul style="list-style-type: none"> • 1NV-221A (NV Pumps Suct from FWST) • 1NV222B (NV Pumps Suct from FWST) 	<p>The operator observes the 1NV-221A Red status light is LIT, Green status light is OFF, and determines that 1NV-221A is OPEN.</p> <p>The operator observes the 1NV-222B Red status light is LIT, Green status light is OFF, and determines that 1NV-222B is OPEN.</p>		
8	(Step 25 RNO d) CLOSE the following valves: <ul style="list-style-type: none"> • 1NV-141A (VCT Outlet Isol). • 1NV-142B (VCT Outlet Isol). 	<p>The operator observes the 1NV-141A Green status light is LIT, Red status light is OFF, and determines that 1NV-141A is CLOSED.</p> <p>The operator observes the 1NV-142B Green status light is LIT, Red status light is OFF, and determines that 1NV-142B is CLOSED.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*9	(Step 25 RNO e) OPEN the following valves: <ul style="list-style-type: none"> 1NI-9A (NC Cold Leg Inj.). 1NI-10B (NC Cold Leg Inj.). 	<p>The operator observes the 1NI-9A Green status light is LIT, and determines that 1NV-9A is CLOSED.</p> <p>The operator presses the 1NI-9A OPEN pushbutton and observes the Red status light is LIT, Green status light is OFF.</p> <p>The operator observes the 1NI-10B Green status light is LIT, and determines that 1NV-10B is CLOSED.</p> <p>The operator presses the 1NI-10B OPEN pushbutton and observes the Red status light is LIT, Green status light is OFF.</p> <p>NOTE:</p> <p>Opening one of these valves satisfies the critical nature of this Step.</p>		
10	(Step 25 RNO f) IF NV S/I flowpath is established, AND NV Pump is on THEN GO TO Step 26.	The operator observes 1NVP-6080 at ≈ 340 gpm, and determines that there is flow from the NV Pumps, and proceeds to Step 26.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	<p>(Step 26) Establish NC System bleed path as follows:</p> <p>(Step 26.a) Check all Pzr PORV isolation valves – OPEN.</p>	<p>The operator observes the 1NC-31B Red status light is LIT, and determines that 1NC-31B is OPEN.</p> <p>The operator observes the 1NC-33A Red status light is LIT, and determines that 1NC-33A is OPEN.</p> <p>The operator observes the 1NC-35B Red status light is LIT, and determines that 1NC-35B is OPEN.</p>		
*12	(Step 26.b) Select "OPEN" on two Pzr PORVs that have an open Pzr PORV isolation valve.	<p>The operator rotates the 1NC-32B, 34A or 36B control switch clockwise, and observes the Red status light LIT.</p> <p>NOTE: Record the time that the 1st Pzr PORV is OPEN.</p> <p>Time Critical START Time:</p> <p>_____</p> <p>The operator rotates the 1NC-32B, 34A or 36B control switch clockwise, and observes the Red status light LIT.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	<p>(Step 26.c) Align N2 to Pzr PORVs by OPENING the following valves:</p> <ul style="list-style-type: none"> • 1NI-430A (Emerg N2 From CLA to 1NC-34A). • 1NI-431B (Emerg N2 From CLA to 1NC-32B & 36B). 	<p>The operator presses the 1NI-430A OPEN pushbutton and observes the Red status light is LIT, Green status light is OFF.</p> <p>The operator presses the 1NI-431B OPEN pushbutton and observes the Red status light is LIT, Green status light is OFF.</p>		
14	(Step 26.d) Check power to all Pzr PORV isolation valves – AVAILABLE.	The operator observes the RED status light LIT for all three PORV Isolation Valves, and determines that power is available to each.		
15	(Step 27) Check two Pzr PORVs and associated isolation valves – OPEN.	The operator observes the 1NC-32B, 34A or 36B RED status light LIT for two of the three PORVs, and determines that two valves are OPEN.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*16	(Step 28) Isolate NV Recirc flowpath as follows: (Step 28.a) CLOSE the following valves: <ul style="list-style-type: none"> • 1NV-150B (NV Pumps Recirculation). • 1NV-151A (NV Pumps Recirculation). 	<p>The operator presses the 1NV-150B CLOSE pushbutton and observes the Green status light is LIT, Red status light is OFF.</p> <p>The operator presses the 1NV-151A CLOSE pushbutton and observes the Green status light is LIT, Red status light is OFF.</p> <p>NOTE Time Critical STOP Time: _____</p>		
17	(Step 28.b) Maintain NV recirc valves closed unless directed to open by subsequent steps.	The operator reports to the CRS that Steps 22-28 of EP/1/A/500/FR-H.1 have been performed.		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

TIME CRITICAL Total Time

_____ minutes

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 Systems - Control Room JPM D

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A Reactor Trip on Lo-Lo S/G Level has occurred due to the loss of both Main Feedwater Pumps.
- The CA System will not start.
- EP/1/A/5000/FR-H.1 (Loss of Secondary Heat Sink) has been implemented.
- Feed and Bleed initiation criteria has been met.

INITIATING CUE:

The CRS has directed you to initiate an NC System Feed and Bleed by performing Steps 22 - 28 of EP/1/A/5000/FR-H.1 (Loss of Secondary Heat Sink).

This is a TIME CRITICAL JPM.

Duke Energy
PROCEDURE PROCESS RECORD

(1) ID No. EP/1/A/5000/FR-H.1
Revision No. 015

INFORMATION ONLY

REPARATION

(2) Station McGuire Nuclear Station

(3) Procedure Title Response To Loss Of Secondary Heat Sink

(4) Prepared By Weiner, Michael R *[Signature]* Date May 17, 2010

(5) Requires NSD 228 Applicability Determination?

- ☒ Yes (New procedure or revision with major changes) - Attach NSD 228 documentation
☐ No (Revision with minor changes)

(6) Reviewed By Joseph S. Hackney *[Signature]* (QR) (KI) Date 9/8/10

Cross-Disciplinary Review By _____ (QR) (KI) NA [Signature] Date _____

Reactivity Mgmt. Review By _____ (QR) NA [Signature] Date _____

Mgmt. Involvement Review By _____ (OPS Supt.) NA [Signature] Date _____

(7) Additional Reviews

Reviewed By _____ Date _____

Reviewed By _____ Date _____

(8) Approved By Brian K. Marrow *[Signature]* Date 10/21/10

PERFORMANCE (Compare with Control Copy every 14 calendar days while work is being performed.)

(9) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(10) Date(s) Performed _____

Work Order Number (WO#) _____

COMPLETION

(11) Procedure Completion Verification:

- ☐ Yes ☐ NA Checklists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
☐ Yes ☐ NA Required enclosures attached?
☐ Yes ☐ NA Charts, graphs, data sheets, etc. attached, dated, identified, and marked?
☐ Yes ☐ NA Calibrated Test Equipment, if used, checked out/in and referenced to this procedure?
☐ Yes ☐ NA Procedure requirements met?

Verified By _____ Date _____

(12) Procedure Completion Approved _____ Date _____

(13) Remarks (Attach additional pages, if necessary)

A. Purpose

This procedure provides actions to respond to a loss of secondary heat sink in all steam generators.

B. Symptoms or Entry Conditions

This procedure is entered from:

- EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection), Step 18, when minimum CA flow is not verified **AND** N/R level in all S/Gs is less than 11% (32% ACC).
- EP/1/A/5000/F-0 (Critical Safety Function Status Trees) (Heat Sink), on a red condition.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

C. Operator Actions

- ✓ 1. IF total feed flow is less than 450 GPM due to operator action, THEN RETURN TO procedure and step in effect.

CAUTION If a non-faulted S/G is available, then feed flow should only be established to non-faulted S/G(s) in subsequent steps.

2. Check if secondary heat sink is required:

✓ a. NC pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE.

✓ b. Any NC T-Hot - GREATER THAN 350° F (347° F ACC).

___ a. RETURN TO procedure and step in effect.

b. Perform the following while continuing in this procedure:

1) Try to place ND in RHR mode as follows:

___ a) Ensure NC pressure is less than 385 PSIG.

___ b) IF S/I has occurred, THEN place ND in RHR mode PER EP/1/A/5000/G-2 (Placing ND In RHR Mode).

___ c) IF S/I has not occurred, THEN place ND in RHR mode PER Enclosure 2 (Placing ND in RHR mode).

___ 2) WHEN adequate ND cooling is established, THEN RETURN TO procedure and step in effect.

✓ 3. Monitor Foldout Page.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

20. (Continued)

- ___ z. **WHEN** other feedwater source is available, **THEN** review Enclosure 14 (Aligning Additional Feedwater Source After RY Feeds S/Gs), prior to aligning other source.

21. Check if NC System feed and bleed should be initiated:

- ___ a. Check feed and bleed - HAS BEEN PREVIOUSLY ESTABLISHED PER STEPS 23 through 27.
- ___ b. **GO TO** Step 39.
- ___ c. Check W/R level in at least 3 S/Gs - LESS THAN 24% (36% ACC).

___ a. **GO TO** Step 21.c.

___ c. **RETURN TO** Step 1.

___ 22. Perform Steps 23 through 27 quickly to establish NC heat removal by NC feed and bleed.

___ 23. Ensure all NC pumps - OFF.

___ 24. Initiate S/I.

___ 25. Check "NV PMPS TO COLD LEG FLOW" - INDICATING FLOW.

Perform the following:

- ___ a. Start NV pumps.
- ___ b. Start NI pumps.
- c. OPEN the following valves:
- ___ • 1NV-221A (NV Pumps Suct From FWST)
- ___ • 1NV-222B (NV Pumps Suct From FWST).

(RNO continued on next page)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

25. (Continued)

d. CLOSE the following valves:

- ___ • 1NV-141A (VCT Outlet Isol)
- ___ • 1NV-142B (VCT Outlet Isol).

e. OPEN the following valves:

- ___ • 1NI-9A (NC Cold Leg Inj From NV)
- ___ • 1NI-10B (NC Cold Leg Inj From NV).

___ f. IF NV S/I flowpath is established, AND NV pump is on THEN GO TO Step 26.

g. IF both of the following conditions exist, THEN GO TO Step 26:

- ___ • Any NI pump is on
- ___ • Reactor was tripped for at least 90 minutes prior to implementing this EP.

___ h. Continue attempts to restore ECCS flow.

___ i. Continue attempts to restore feed flow to S/Gs.

___ j. IF EP/1/A/5000/FR-S.1 (Response To Nuclear Power Generation/ATWS) OR EP/1/A/5000/FR-C.1 (Response To Inadequate Core Cooling) has been previously implemented, THEN RETURN TO Step 6.

___ k. Energize H₂ Igniters by depressing "ON" and "OVERRIDE".

___ l. Dispatch operator to stop all Unit 1 NF AHUs PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 28 (De-energizing Ice Condenser AHUs)

___ m. RETURN TO Step 6.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

26. Establish NC System bleed path as follows:

- ☐ a. Check all Pzr PORV isolation valves - OPEN.
- ☐ b. Select "OPEN" on two Pzr PORVs that have an open Pzr PORV isolation valve.
- ☐ c. Align N₂ to Pzr PORVs by OPENING the following valves:
 - ☐ • 1NI-430A (Emerg N₂ From CLA To 1NC-34A)
 - ☐ • 1NI-431B (Emerg N₂ From CLA To 1NC-32B & 36B).
- ☐ d. Check power to all Pzr PORV isolation valves - AVAILABLE.

- ☐ a. OPEN all Pzr PORV isolation valves.
- ☐ c. Perform the following:
 - ☐ 1) Ensure Phase B reset.
 - ☐ 2) OPEN the following valves:
 - ☐ • 1VI-129B (VI Supply to A Cont Ess VI Hdr Outside Isol)
 - ☐ • 1VI-160B (VI Supply to B Cont Ess VI Hdr Outside Isol)
 - ☐ • 1VI-150B (Lwr Cont Non-Ess Cont Outside Isol).
 - ☐ 3) IF VI header pressure is less than than 85 PSIG, THEN perform the following:
 - ☐ • Ensure Pzr PORVs with N₂ aligned have been OPENED.
 - ☐ • Ensure only two Pzr PORV bleed paths are selected OPEN.
 - ☐ • Restore VI PER AP/1/A/5500/22 (Loss Of VI).
- ☐ d. Perform the following:
 - ☐ 1) Evaluate cause of power loss and initiate actions to restore power to affected isolation valve(s).
 - ☐ 2) WHEN power is restored, THEN perform the following:
 - ☐ a) OPEN Pzr PORV isolation valves.
 - ☐ b) Ensure two Pzr PORVs that have an open Pzr PORV isolation valve are OPENED.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- ___ 27. Check two Pzr PORVs and associated isolation valves - OPEN.

Perform the following:

- ___ a. Attempt to OPEN two Pzr PORVs and associated isolation valves.
- ___ b. IF two Pzr PORV flow paths are opened, THEN GO TO Step 28.

- c. OPEN one train of head vent valves:

• Train A:

- ___ • 1NC-272AC (U1 A Train Head Vent to PRT Isol)

- ___ • 1NC-273AC (U1 A Train Head Vent to PRT Isol).

OR

• Train B:

- ___ • 1NC-274B (U1 B Train Head Vent to PRT Isol)

- ___ • 1NC-275B (U1 B Train Head Vent to PRT Isol).

28. Isolate NV Recirc flowpath as follows:

- a. CLOSE the following valves:

- ___ • 1NV-150B (NV Pumps Recirculation)

- ___ • 1NV-151A (NV Pumps Recirculation).

- ___ b. Maintain NV recirc valves closed unless directed to open by subsequent steps.

1. **NC System Feed and Bleed Criteria (Applies after Step 2 in the body of the procedure):**

- **IF** W/R level in at least 3 S/Gs goes below 24% (36% ACC), **THEN GO TO** Step 22 in the body of the procedure.

2. **Cold Leg Recirc Switchover Criteria:**

- **IF** FWST level reaches 180 inches ("FWST LEVEL LO" alarm), **THEN GO TO** EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc).

3. **CA Suction Sources:**

- **IF** CA storage tank (water tower) goes below 1.5 ft, **THEN** perform EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 20 (CA Suction Source Realignment).

SIM JPM E

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Perform the Main Turbine
Overspeed Trip TestJPM No.: 2011 Systems - Control
Room JPM E
(Alternate Path)

K/A Reference: 045 A3.08 (3.3*/3.5*)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: X Classroom _____ Simulator X Plant _____**READ TO THE EXAMINEE**

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

Initial Conditions:

- Unit 1 is starting up after a refueling outage.
- The Turbine/Generator is off line and rolling at 1800 RPM in preparation for performing PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test).
- All prerequisite conditions have been met and two operators have been stationed at the Turbine as required.
- Communications have been established with all involved.

Task Standard:

The operator will raise Turbine speed to OPC setpoint, and then raise speed until the Turbine Overspeed trip should be actuated. The operator recognizes the turbine has failed to trip at the expected setpoint and then manually trips the Turbine.

Required Materials: Ensure test key #63 is available.

General References: PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test), Rev. 16

Handouts: PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test) marked up through Step 12.6.

Job Performance Measure Worksheet

Initiating Cue: The CRS has directed you to complete the Turbine OPC and Mechanical Overspeed Trip Test per PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test), starting with Step 12.7.

Time Critical Task: No

Validation Time: 12 minutes

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset to IC-30, Turbine at 1800 RPM
2. Insert malfunction: MAL-DEH003A, Failure of Auto Turbine Trip
3. Place voltage regulator switch to "MAN" position.
4. Ensure "excitation" is in "TRIP"
5. Ensure Main Gen MOD's open.
6. Freeze the Simulator

OR

1. Reset Simulator to Temporary Snap IC-254 (March, 2011)
2. Momentarily place Simulator in Run to acknowledge alarms.
3. Leave Simulator in FREEZE until operator is ready to begin.

NOTES: Provide an operator to acknowledge unrelated alarms and control Reactor Power (since Rods are in "Manual").

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout PT/1/A/4250/004C marked up through Step 12.6.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
*1	(Step 12.7) Depress ACC RATE.	The operator presses the ACC RATE pushbutton on the Turbine Control Panel, and observes White status light is LIT.		
*2	(Step 12.8) Enter acceleration rate of 25 RPM/MIN in "Variable Display"	The operator enters "0025" in the "Variable Display," and presses ENTER.		
3	(Step 12.9) Depress REFERENCE.	The operator presses the REFERENCE pushbutton on the Turbine Control Panel, and observes White status light is LIT.		
*4	(Step 12.10) Enter speed of 1860 rpm in the "Variable Display" window.	The operator enters "1860" in the "Variable Display," and presses ENTER.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	<p>(Notes prior to Step 12.11) Steps 12.11 – 12.14 should be read and understood for quick performance. Once OPC Controller actuates, going to "Mechanical Overspeed Test" on turbine will prevent multiple actuation of OPC Controller and loss of LH header pressure.</p> <p>Digital Control Board meter should be used in the following steps.</p>	The operator reads the NOTES and reviews Steps 12.11 – 12.14, and proceeds.		
6	(Step 12.11) Depress "GO."	The operator presses the GO pushbutton on the Turbine Control Panel, and observes White status light is LIT.		
7	(Step 12.12) Check Turbine starts increasing speed at selected rate.	The operator observes the Digital Turbine Speed indicator and determines that Turbine speed is rising at the expected rate.		
8	<p>(Step 12.13) IF demand speed of 1860 rpm is reached before OPC Controller actuates, perform one of the following:</p> <p>(Step 12.13.1) Reduce Turbine speed to 1800 rpm (100%).</p> <p>OR</p> <p>(Step 12.13.2) IF unable to reduce speed, have operator at Turbine Trip Lever trip Turbine.</p>	The operator observes that Turbine Speed rises to ≈ 1860 , and stops, and places and NA in this step.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*9	(Step 12.14) After OPC Controller actuated, place "OPC" in "MECHANICAL OVERSPEED TEST" using "OPC" key #63.	The operator rotates the 63 OPC Key Switch and clockwise.		
10	(Step 12.15) IF LH header pressure fails to recover, following an OPC controller actuation,.....	The operator observes LH Fluid Pressure (Chart Recorder) and determines that pressure has recovered properly; and places an NA in this step.		
11	(Step 12.16) Record on Enclosure 13.1 (Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet) the actual speed at which the Turbine OPC Controller actuated.	<p>The operator provides the required Data to another operator.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Cue: Another operator will log the data.</p> </div>		
12	(Note prior to Step 12.17) Steps 12.17 – 12.23 test Mechanical Overspeed Trip mechanism.	The operator reads the NOTE and proceeds.		
*13	(Step 12.17) Depress "ACC RATE".	The operator presses the ACC RATE pushbutton on the Turbine Control Panel, and observes White status light is LIT.		
*14	(Step 12.18) Enter acceleration rate of 50 rpm/min in "Variable Display".	The operator enters "0050" in the "Variable Display," and presses ENTER.		
*15	(Step 12.19) Depress "REFERENCE."	The operator presses the REFERENCE pushbutton on the Turbine Control Panel, and observes White status light is LIT.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*16	(Step 12.20) Enter speed of 2000 rpm in "Variable Display".	The operator enters "2000" in the "Variable Display," and presses ENTER.		
*17	(Step 12.21) Depress "GO."	The operator presses the GO pushbutton on the Turbine Control Panel, and observes White status light is LIT.		
18	(Step 12.22) Check Turbine starts increasing speed to 2000 rpm at selected rate.	The operator observes the Digital Turbine Speed indicator and determines that Turbine speed is rising at the expected rate.		
19	(Caution prior to Step 12.23) The Mechanical Overspeed Trip must occur at or before 1998 RPM (111%)	The operator reads the CAUTION and proceeds.		
20 *	(Step 12.23) IF Turbine speed reaches 1998 rpm (111%) before Mechanical Overspeed Trip actuates, trip Turbine.	<p>The operator observes MCB Annunciator 1AD-1, B-9, TURBINE OVERSPEED (11%) TURB TRIP, alarms at ≈1880 RPM.</p> <p>The operator observes the Digital Turbine Speed indicator and determines Turbine has not tripped at or before 1998 RPM and trips the turbine by placing the Turbine Trip Switch in the TRIP position.</p> <p>The operator observes all Throttle and Governor valves indicate closed, speed is decreasing.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
21	(Step 12.24) Record on Enclosure 13.1 (Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet) the actual speed at which the Turbine trips.	<div>The operator provides the required Data to another operator.</div> <div>Cue: Another operator will log the data.</div>		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 Systems - Control Room JPM E

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result:

SAT _____

UNSAT _____

Examiner's Signature: _____

Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 is starting up after a refueling outage.
- The Turbine/Generator is off line and rolling at 1800 RPM in preparation for performing PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test).
- All prerequisite conditions have been met and two operators have been stationed at the Turbine as required.
- Communications have been established with all involved.

INITIATING CUE:

The CRS has directed you to complete the Turbine OPC and Mechanical Overspeed Trip Test per PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test), starting with Step 12.7.

Duke Energy
McGuire Nuclear Station
Turbine OPC and Mechanical Overspeed Trip Test

Procedure No.

PT/1/A/4250/004 C

Revision No.

016

Electronic Reference No.

MC0047W7

Continuous Use

PERFORMANCE

***** UNCONTROLLED FOR PRINT *****

(ISSUED) - PDF Format

Revision History (significant issues, limited to one page)

- Rev 016 EC-77859 (MD-100165) replaces Main Generator Protective Relaying with microprocessor based multifunctional relaying schemes. Overfrequency Trip Relay no longer requires opening all knife switches to prevent actuation during test; Overfrequency Trip is automatically bypassed while Generator field is **NOT** flashed. Deleted previous revision Steps 12.17 and 12.27 and added Prerequisite System Condition that "EXCITATION" is "OFF".
- Rev 015 -Section 7. "Required Unit Status" changed from 12 - 15% RTP to 12 - 18% RTP to match OP*/A/6100/003 (Controlling Procedure for Unit Operation).
-Step 8.4 (third bullet) clarified that System Engineering waiving the minimum time requirement only applies to the 2 hour hold at 1800 rpm.
- Rev 014
- Updated Prerequisite System Conditions to include performing this test while at 1800 rpm prior to putting the main generator on line. Engineering desires to perform Turbine Overspeed Trip testing while at 1800 rpm and in "Single Valve Mode" (prior to TV/GV Transfer). A review of past data indicates the turbine heat up from time spent at sync speed no load (at least 2 hours) is sufficient to perform the testing without having to go online to heat up the turbine.
 - Updated procedure to include Reactivity Management guidelines (NSD-703).
- Rev 013 Added checks to sections for evaluation of Acceptance Criteria and notifications if Acceptance Criteria **NOT** met per PIP M-07-00393.
- Rev 012 Section 8, add to Prerequisite System Condition 8.4, ". . . . OR System Engineer has been contacted to waive this minimum time requirement." A NOTE was added to explain why the 2 hour time may not be necessary.
- Rev 011
- Added step to check Acceptance Criteria met. Procedure had no step to check Acceptance Criteria after test was complete.
 - Changed Acceptance Criteria from "OPC Controller must actuate to reduce the Turbine speed at or below OPC Controller setpoint of 1854 rpm (103%)." to "OPC Controller must actuate between 1850 rpm and 1858 rpm to reduce the Turbine speed to less than OPC Controller setpoint of 1854 rpm (103%)." Step was confusing and implied that Acceptance Criteria was not met if Turbine speed increased above 1854 rpm. The 4rpm range above and below the setpoint of 1854 rpm, is within the accuracy of the Control Board meter. {PIP-M-05-1985}
 - Added note to existing note before Step 2.11 that the digital Control Board meter should be used for Turbine speed. The same speed transmitter that feeds the OPC Controller also feeds the Control Board meter.

Unit 1

Turbine OPC And Mechanical Overspeed Trip Test

1. Purpose

To test Electrical Overspeed Protection Device on Main Turbine by intentionally increasing Turbine speed to OPC Controller Limit Setpoint and observing Intercept / Governor Valves closing, bringing Turbine speed below OPC Controller limit of 103%.

To test Mechanical Overspeed Trip Device on Main Turbine by intentionally increasing Turbine speed to Overspeed Trip Setpoint.

2. References

2.1 McGuire FSAR:

- 10.2.2 (Turbine Generator - Description)
- 10.2.5 (Turbine Generator - Tests and Inspections)

2.2 Selected License Commitment Manual 16.7.5

2.3 MCM-1200.00-152, Westinghouse Instruction Book 1250-C831, "Steam Turbine for Duke Power Company--McGuire Station" (Volume 1)

2.4 OP/1/A/6300/001 (Turbine - Generator Startup / Shutdown)

3. Time Required

3.1 Three operators for 45 minutes during each refueling outage.

4. Prerequisite Tests

None

5. Equipment Required

5.1 "OPC" test key #63

6. Limits and Precautions

- 6.1 This procedure is Reactivity Management related because it controls activities that can directly affect core reactivity by changing NC System temperature. (R.M.)
- 6.2 Maximum Low Pressure Turbine steam inlet temperature is 400°F.
- 6.3 Maximum allowed Turbine Vibration is 14.0 mils (16.0 mils for #11 Bearing).

7. Required Unit Status

- 7.1 Reactor power 12 - 18% RTP.

8. Prerequisite System Conditions

- 8.1 Turbine - Generator is at 1800 rpm per OP/1/A/6300/001 (Turbine - Generator Startup / Shutdown).
- 8.2 Generator Breakers 1A and 1B are open.
- 8.3 "EXCITATION" is "OFF".
- 8.4 Turbine Electronic Governor is operating and has control of Turbine.

~~8.5~~

One of the following conditions exists:

8.5.1

Turbine - Generator has been operating at greater than 112 MWe for greater than 2 hours.

OR

~~8.5.2~~

Turbine - Generator has been operating at 1800 rpm for greater than 2 hours.

OR

NOTE:

The 2 hour time requirement is for the turbine and generator to reach thermal equilibrium before conducting the overspeed test. However, during infrequent events, such as prolonged testing, holding the unit at 1800 rpm for an extended period of time is adequate to reach thermal equilibrium. The System Engineer may consider waiving this time requirement if system conditions allow.



Expected Governor End differential expansion drop is 15 - 25 mils from peak value at 1800 rpm.



Expected Generator End differential expansion drop is 20 - 40 mils from peak value at 1800 rpm.

8.5.3

System Engineer has been contacted to waive the 2 hour hold at 1800 rpm and has confirmed the following: {PIP 08-2617}

- ☐ No turbine temperature or vibration alarms exist
- ☐ Governor End differential expansion (OAC point M1A1351) has adequate margin to perform mechanical overspeed trip test
- ☐ Generator End differential expansion (OAC point M1A1357) has adequate margin to perform mechanical overspeed trip test

Person Notified_____
Date Time**Unit 1**

9. Test Method

Overspeed Protection Controller (OPC) Test will be accomplished by setting a pre-determined target overspeed in Turbine Controller. One operator will be stationed at Turbine to monitor for abnormal vibration, noise, etc., during test. Another operator, in communication with Control Room, shall stand by Local Trip Lever ready to manually trip Turbine instantly in the event the Control Operator is unable to reduce Turbine speed after it reaches demand speed. Acceptance Criteria (Section 11) is satisfied when OPC Controller actuates to reduce Turbine speed less than or equal to OPC Controller setpoint (103%) by closing Intercept and Governor Valves.

Mechanical overspeed test is accomplished by setting a pre-determined target overspeed in Turbine Controller. "OPC" key-switch must be in "MECHANICAL OVERSPEED TEST" position to enable Turbine to exceed OPC Trip setpoint. An operator will be stationed at Turbine to monitor for abnormal vibration, noise, etc., during test, and another operator in communication with Control Room at all times shall stand by Local Trip Lever ready to manually trip Turbine instantly if it fails to trip automatically at target speed. Acceptance Criteria (Section 11) is satisfied if Mechanical Overspeed Trip Device actuates to trip Turbine at or prior to 1998 rpm (111%).


10. Data Required

- 10.1 Record in Enclosure 13.1 (Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet.) actual Turbine speed where OPC Controller actuates.
- 10.2 For mechanical overspeed test, record in Enclosure 13.1 (Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet.) the actual speed at which Turbine trips.
- 10.3 Record in Enclosure 13.1 (Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet.) the verification that the electrical overspeed at 1998 rpm (111%) failed to trip Turbine.

11. Acceptance Criteria

- 11.1 OPC Controller must actuate between 1850 rpm and 1858 rpm to reduce the Turbine speed to less than or equal to OPC Controller setpoint of 1854 rpm (103%).
- 11.2 Mechanical Overspeed Trip Device must actuate to trip the Turbine at or prior to reaching Turbine speed of 1998 rpm (111%).

12. Procedure

- ☒ (2.1) Evaluate all outstanding R&Rs that may impact performance of this procedure.
-  ☒ (2.2) Ensure that a pre-job briefing has been performed that includes discussion of reactivity management concerns with this procedure.
SRO
- ☒ (2.3) Station an operator at Turbine to monitor for abnormal conditions.
- ☒ (2.4) Station an operator at Local Turbine Trip Lever.
- ☒ (2.5) Station an operator at Turbine Control Panel in Control Room.

NOTE: Operators performing test shall maintain direct communications throughout test.

- ☒ (2.6) Establish communication between operators performing test.

_____ 12.7 Depress "ACC RATE".

_____ 12.8 Enter acceleration rate of 25 rpm/min in "Variable Display".

_____ 12.9 Depress "REFERENCE".

_____ 12.10 Enter speed of 1860 rpm in "Variable Display".

NOTE:

- Steps 12.11 - 12.14 should be read and understood for quick performance. Once OPC Controller actuates, going to "Mechanical Overspeed Test" on Turbine will prevent multiple actuation of OPC Controller and loss of LH header pressure.
- Digital Control Board meter should be used in the following steps.

☐ 12.11 Depress "GO".

☐ 12.12 Check Turbine starts increasing speed at selected rate.

_____ 12.13 **IF** demand speed of 1860 rpm is reached before OPC Controller actuates, perform one of the following:

☐ 12.13.1 Reduce Turbine speed to 1800 rpm (100%).

OR

_____ 12.13.2 **IF** unable to reduce speed, have operator at Turbine Trip Lever trip Turbine.

Unit 1

_____ 12.14 **AFTER** OPC Controller actuated, place "OPC" in "MECHANICAL OVERSPEED TEST" using "OPC" key #63.

_____ 12.15 **IF** LH header pressure fails to recover following an OPC controller actuation, perform the following:

_____ 12.15.1 Trip Turbine.

_____ 12.15.2 Depress "LATCH" until lit.

_____ 12.15.3 Depress "ACC RATE".

_____ 12.15.4 Enter acceleration rate of 25 rpm/min in "Variable Display".

_____ 12.15.5 Depress "REFERENCE".

_____ 12.15.6 Enter speed of 1800 rpm in "Variable Display".

_____ 12.15.7 Depress "GO".

☐ 12.15.8 Check Turbine starts increasing speed at selected rate.

☐ 12.16 Record on Enclosure 13.1 (Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet) actual speed at which Turbine OPC Controller actuated.

NOTE: Steps 12.17 - 12.23 test Mechanical Overspeed Trip mechanism.

_____ 12.17 Depress "ACC RATE".

_____ 12.18 Enter acceleration rate of 50 rpm/min in "Variable Display".

_____ 12.19 Depress "REFERENCE".

_____ 12.20 Enter speed of 2000 rpm in "Variable Display".

_____ 12.21 Depress "GO".

☐ 12.22 Check Turbine starts increasing to 2000 rpm at selected rate.

CAUTION: The Mechanical Overspeed Trip must occur at or before 1998 rpm (111%).

_____ 12.23 **IF** Turbine speed reaches 1998 rpm (111%) before Mechanical Overspeed Trip actuates, trip Turbine.

Unit 1

☐ 12.24 Record on Enclosure 13.1 (Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet.) actual speed at which Turbine trips.

☐ 12.25 Record on Enclosure 13.1 (Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet.) OAC Point M1S0234 alarm status.

_____ 12.26 Place "OPC" in "OFF".

_____ 12.27 Return "OPC" key #63 to SRO.

_____ 12.28 Acceptance Criteria met. Yes No
 ☐ ☐

_____ 12.29 **IF** Acceptance Criteria **NOT** met, log applicable Tech Spec or SLC. {PIP M-07-00393}
SRO

_____ 12.30 **IF** power reduction was in progress, continue Turbine - Generator shutdown per OP/1/A/6300/001 (Turbine - Generator Startup / Shutdown).

_____ 12.31 **IF** power increase was in progress, complete the following:

_____ 12.31.1 **AFTER** turbine speed less than 1800 rpm, depress "LATCH" until lit.

NOTE: **WHEN** in single valve mode, governor valve full open position is 50.2%.

12.31.2 Check open the following:

- ☐ Governor Valves
- ☐ Intercept Valves
- ☐ Reheat Stop Valves

_____ 12.31.3 **IF** turbine speed less than 1800 rpm, perform the following:

_____ 12.31.3.1 Depress "ACC RATE".

_____ 12.31.3.2 Enter acceleration rate of 25 rpm/min in "Variable Display".

_____ 12.31.3.3 Depress "REFERENCE".

_____ 12.31.3.4 Enter speed of 1800 rpm in "VARIABLE DISPLAY".

_____ 12.31.3.5 Depress "GO".

- ☐ 12.31.3.6 Check "REFERENCE" display starts counting up to 1800 rpm at selected acceleration rate.

☐ 12.31.4 **AFTER** Turbine speed is 1800 rpm, continue turbine startup per OP/1/A/6300/001 (Turbine - Generator Startup / Shutdown).

Unit 1

13. Enclosures

13.1 Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet.

End Of Body

Unit 1

Enclosure 13.1**Turbine OPC Overspeed Test and Turbine
Overspeed**

PT/1/A/4250/004 C

Page 1 of 1

Step	rpm	Initials
Speed at which OPC Controller actuated (Step 12.16)		
Speed at which mechanical overspeed actuated to trip the turbine (Step 12.24)		
OAC Point M1S0234 out of alarm (Step 12.25)	N/A	
Remarks:		

Initial one of the following:

- ____ • No Discrepancy
- ____ • Discrepancy Sheet Attached (**IF** any Acceptance Criteria **NOT** met, it is identified as a
SRO discrepancy, evaluated per Tech Spec / SLC and appropriate corrective action taken.)

End Of Enclosure**Unit 1**

SIM JPM F

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Restore from a Fire in the Unit 1
Cable Spreading RoomJPM No.: 2011 Systems - Control
Room JPM F
(Alternate Path)

K/A Reference: APE 067 AA2.04 3.1/4.3

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: XClassroom _____ 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 and 2 are at 100% power.
A fire has been reported in the Unit 1 Cable Spreading Room.
The crew has implemented AP/1/A/5500/45 (Plant Fire) and is presently in Enclosure 17 (AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions).
The following actions have been taken in response:

- The breaker for 1CA-7AC has been OPENED.
- The Pzr PORV Isolation Valves have been CLOSED.
- The Main Steamline PORV Manual Loaders have been closed.

The Fire Brigade has reported that the fire is no longer active.
The SSF has NOT been activated.
Station Management has indicated that the crew may return Control Room controls to normal as identified within Enclosure 17.
NLO (John) is standing by to assist.

Task Standard: The operator will determine that one Pzr PORV has inadvertently opened, and take action to isolate it by ensuring that its isolation valves is closed, and by directing that its motor breaker be opened. The operator will then open the remaining Pzr PORV isolation valves, direct that the motor breaker for 1CA-7AB be closed, and open the manual loaders for the Main Steam Line PORVs while the valves remain closed.

Job Performance Measure Worksheet

Required Materials: None

General References: AP/1/A/5500/45 (Plant Fire), Rev. 12
 PT/1/A/4600/003D (Monthly Surveillance Items), Rev. 76

Handouts: AP/1/A/5500/45 (Plant Fire), Enclosure 17 (AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions) marked up for place-keeping through Step 20.

Initiating Cue: The CRS has directed you to restore the Control Room controls to normal by performing Step 21.a through e of Enclosure 17 (AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions) of AP/1/A/5500/45 (Plant Fire).

Time Critical Task: NO

Validation Time: 12 minutes

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset to IC # 39, 100% Power, MOL. Go to RUN.
2. Take all actions required by AP/1/A/5500/45 (Plant Fire), Enclosure 17 (AB 750' Unit 1 / Cable Spreading Room Fire Unit 1 Actions), Steps 1-17 as follows:
 - LOA-CA015 = Racked Out (Step 5)
 - Close 1NC-31B, 33A and 35B (Step 6)
 - Close the 1SV-19AB, 13AB, 7ABC, and 1AB Manual Loaders (Step 17)
3. Override 1NC32B Red Status light ON (Both RED/Green status lights should be ON, indicating valve mid-position. (This should have no effect with Isolation Valve Closed).
4. Place LOA-NC033 = Racked Out on Trigger #1.
5. Place LOA-CA015 = Racked IN on Trigger #3.
6. Allow plant time to stabilize and then Freeze Simulator.

OR

1. Reset Simulator to Temporary Snap IC-255 (March, 2011).
2. Momentarily place Simulator in Run to acknowledge alarms/Reset SLIMS.
3. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: The Simulator Operator will need to operate Trigger #1 at Step 4 of this JPM, and Trigger #3 at Step 7 of this JPM.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 17 of AP/1/A/5500/45 marked up for place-keeping through Step 20.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<p>(Step 21) WHEN the fire is reduced to a non active status, THEN have station management evaluate returning controls to normal as follows:</p> <p>(Caution prior to Step 21.a) If the SSF has been activated.....</p> <p>(Step 21.a) Check the following Pzr PORVs – Closed:</p> <ul style="list-style-type: none"> 1NC-34A (PZR PORV) * 1NC-32B (PZR PORV) 1NC-36B (PZR PORV) 	<p>The operator recognizes that the SSF has NOT been activated and proceeds.</p> <p>The operator observes the 1NC-34A Green status light LIT, Red status light OFF.</p> <p>The operator observes the 1NC-32B Green and Red status lights LIT. (ALTERNATE PATH)</p> <div style="border: 1px solid black; padding: 5px;"> <p>NOTE: The Operator will likely address the RNO before checking the status of 1NC-36B.</p> </div> <p>The operator observes the 1NC-36B Green status light LIT, Red status light OFF.</p> <p>The operator determines that one PORV is OPEN (1NC-32B), and implements the Step 21.a RNO.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	(Step 21.a RNO) Perform the following: (Step 21.a RNO 1) Close Pzr PORV(s)	The operator rotates the 1NC-32B Control Switch counter-clockwise to the CLOSE position, and observes the 1NC-32B Green and Red status lights LIT.		
3	(Step 21.a RNO 2) IF a Pzr PORV will not close, THEN perform the following: (Step 15.a RNO 2.a) CLOSE the associated Pzr PORV isolation valve.	The operator observes the 1NC-31B Green status light LIT, Red status light OFF.		
*4	(Step 21.a RNO 2.b) Dispatch operator to open breaker for the closed Pzr PORV isolation valve.	The operator contacts NEO and directs that the breaker for 1NC-31B be opened.		
<p>NOTE: Simulator Driver Operate Trigger #1.</p> <p>Within 30 seconds report back as the NEO that the breaker for 1NC-31B has been opened.</p> <p>Examiner NOTE: (Alternate Path) It is expected that the operator will NOT re-open 1NC-31B in the subsequent Step. If the operator attempts to open the valve before the NEO reports that the breaker is open, the JPM is failed. IF the operator attempts to open 1NC-31B after the breaker has been opened, 1NC-31B will NOT open, and the operator will NOT necessarily fail the JPM.</p>				
*5 (See Above Note)	(Step 21.b) Open Pzr PORV isolation valves for PORVs that are verified closed.	<p>The operator rotates the 1NC-33A Control Switch to OPEN, and observes the Red status light LIT, Green status light OFF.</p> <p>The operator rotates the 1NC-35B Control Switch to OPEN, and observes the Red status light LIT, Green status light OFF.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	(Caution prior to Step 21.c) A fire induced hot short may cause valve in next step to operate when power is restored.	The operator reads the Caution, and proceeds.		
*7	(Step 21.c) Dispatch operator to close breaker 1EMXA4-2A (Unit 1 TD CA Pump Suction Isol Motor (1CA-7A) (north wall 1ETA room).	The operator contacts NEO and directs that the breaker for 1CA-7A be closed.		
NOTE: Simulator Driver Operate Trigger #3. Within 30 seconds report back as the NEO that the breaker for 1CA-7AC has been closed.				
8	(Step 21.d) Ensure 1CA- 7AC (U1 TD CA Pump Suction Isol) is in proper position.	After the report of the 1CA- 7AC Breaker being closed, the operator observes the 1CA-7AC Red status light is LIT, Green status light is OFF.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*9	<p>(Step 21.e) Slowly open the following manual loaders while ensuring that the valves remain closed:</p> <p>Slowly OPEN 1SV-19AB (1A Main Steam Line PORV)</p> <p>Slowly OPEN 1SV-13AB (1B Main Steam Line PORV)</p> <p>Slowly OPEN 1SV-7ABC (1C Main Steam Line PORV)</p> <p>Slowly OPEN 1SV-1AB (1D Main Steam Line PORV)</p>	<p>The operator rotates the 1SV-19AB adjust knob clockwise until the Manual Loader indicates 100%, the Green status light is LIT, and the Red status light is OFF.</p> <p>The operator rotates the 1SV-13AB adjust knob clockwise until the Manual Loader indicates 100%, the Green status light is LIT, and the Red status light is OFF.</p> <p>The operator rotates the 1SV-7ABC adjust knob clockwise until the Manual Loader indicates 100%, the Green status light is LIT, and the Red status light is OFF.</p> <p>The operator rotates the 1SV-1AB adjust knob clockwise until the Manual Loader indicates 100%, the Green status light is LIT, and the Red status light is OFF.</p>		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 Systems - Control Room JPM F

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

Unit 1 and 2 are at 100% power.

A fire has been reported in the Unit 1 Cable Spreading Room.

The crew has implemented AP/1/A/5500/45 (Plant Fire) and is presently in Enclosure 17 (AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions).

The following actions have been taken in response:

- The breaker for 1CA-7AC has been OPENED.
- The Pzr PORV Isolation Valves have been CLOSED.
- The Main Steamline PORV Manual Loaders have been closed.

The Fire Brigade has reported that the fire is no longer active.

The SSF has NOT been activated.

Station Management has indicated that the crew may return Control Room controls to normal as identified within Enclosure 17.

NLO (John) is standing by to assist.

INITIATING CUE:

The CRS has directed you to restore the Control Room controls to normal by performing Step 21.a through e of Enclosure 17 (AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions) of AP/1/A/5500/45 (Plant Fire).

MNS
AP/0/A/5500/45

UNIT 0

PLANT FIRE

Enclosure 17 - Page 1 of 10

AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions.

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE This enclosure should be read to operators on both units.

___ 1. Check fire status - ACTIVE.

___ RETURN TO Step 6 in body of this procedure.

CAUTION The SSF is the assured Safe Shutdown Train for a fire in this area.

___ 2. Check Unit 1 - IN MODE 1, 2, OR 3.

___ GO TO Step 7.

NOTE Steps 3 through 6 are time critical.

___ 3. Check 1CA-7AC (U1 TD CA Pump Suction Isol) - OPEN.

___ OPEN 1CA-7AC (U1 TD CA Pump Suction Isol).

___ 4. Check NEO - AVAILABLE FOR DISPATCH IN BACK OF CONTROL ROOM.

Perform the following:

___ a. Notify operator dispatched in next step to avoid Unit 1 Cable Spreading Room.

___ b. Dispatch operator to open Unit 1 breaker 1EMXA4 - 2A (Unit 1 TD CA Pump Suction Isol Motor (1CA-7A)) (north wall 1ETA room).

___ c. GO TO Step 6.

___ 5. Dispatch operator to open breaker for Unit 1 1CA-7AC PER Enclosure 48 (Alternate Path Opening 1CA-7AC Breaker).

MNS AP/0/A/5500/45 UNIT 0	PLANT FIRE Enclosure 17 - Page 2 of 10 AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions	PAGE NO. 98 of 197 Rev. 12
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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6. **CLOSE the following Pzr PORV isolation valves on Unit 1:**

- ___ • 1NC-33A (PZR PORV Isol)
- ___ • 1NC-31B (PZR PORV Isol)
- ___ • 1NC-35B (PZR PORV Isol).

- ___ 7. **WHEN NEO available in back of control room, THEN dispatch operator to locally fail OPEN 1RY-113 or 1RY-114 PER Enclosure 32 (Locally Failing Open 1RY-113 or 1RY-114).**

CAUTION

- A fire in this area may cause a loss of all NC pump seal cooling. If this occurs, the following time critical actions apply:
 - Dispatch operator to the SSF to start the Standby Makeup pump within 2 minutes of losing all NC pump seal cooling.
 - Trip all NC pumps within 3 minutes of losing all NC pump seal cooling.
 - Dispatch operator to perform required actions in ETA room within 4 minutes of losing all NC pump seal cooling.
- NC pump seal cooling must be monitored continuously while the fire is active, even if emergency procedures are subsequently implemented.

8. **Monitor NC pump seal cooling as follows:**

- | | |
|--|--------------------------------------|
| ___ a. Check Unit 1 - IN MODE 1, 2, OR 3. | ___ a. <u>GO TO</u> Step 8.c. |
| ___ b. Designate Unit 1 OATC to continuously monitor NC pump seal cooling <u>PER</u> Enclosure 33 (Monitoring Unit 1 NC Pump Seal Cooling). | |
| ___ c. Check Unit 2 - IN MODE 1, 2, OR 3. | ___ c. <u>GO TO</u> Step 9. |
| ___ d. Designate Unit 2 OATC to continuously monitor NC pump seal cooling <u>PER</u> Enclosure 34 (Monitoring Unit 2 NC Pump Seal Cooling). | |

MNS
AP/0/A/5500/45

UNIT 0

PLANT FIRE

Enclosure 17 - Page 3 of 10

AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- ___ 9. Notify NEOs in back of control room that hand held battery lights are available near the Unit 1 Loose Parts Monitor for use in going to the SSF from the Control Room.

- ___ 10. Check Unit 1 - IN MODE 1, 2, OR 3.

Perform the following:

- ___ a. **IF AT ANY TIME** Unit 1 has lost all seal cooling (seal injection and thermal barrier), **THEN** ensure all Unit 1 NC pumps are off.
- ___ b. **GO TO** Step 13.

MNS
AP/0/A/5500/45
UNIT 0

PLANT FIRE
Enclosure 17 - Page 4 of 10
AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION The following continuous action applies even after leaving this AP and takes priority over other EP/AP guidance. Ensure this step is flagged and crew prepared to perform immediately upon loss of all NC pump seal cooling.

NOTE If a blackout causes loss of all NC pump seal cooling and AP07 immediate actions restore seal cooling, the following step does not need to be performed.

11. **IF AT ANY TIME** Unit 1 has lost all seal cooling (seal injection and thermal barrier), **THEN** transfer control of Unit 1 to the SSF as follows:

___ a. Dispatch operator to obtain Blue Folder at SSF and complete Enclosure 1 (Unit 1 SSF - AP-24 Actions) in Blue Folder.

___ b. Trip Unit 1 reactor.

___ c. Trip all Unit 1 NC pumps.

c. Perform the following:

___ 1) Open all Unit 1 NC pump 6900V supply breakers.

___ 2) **IF** all NC pumps are off, **THEN GO TO** Step 11.d.

___ 3) **IF** NC pump(s) will not trip, **THEN** dispatch RO or other operator in Control Room to trip Unit 1 NC pump(s) from Unit 1 6900V swgr room **PER** Enclosure 36 (Tripping Unit 1 NC Pumps from Unit 1 6900V Swgr Rm).

___ d. Check NEO - AVAILABLE FOR DISPATCH IN BACK OF CONTROL ROOM.

d. Perform the following:

___ 1) Dispatch operator obtain Blue Folder at 1EMXA4 (north wall of Unit 1 ETA Room) and complete Enclosure 2 (Unit 1 EMXA-4 - AP-24 Actions) in Blue Folder.

___ 2) **GO TO** Step 11.f.

-MNS AP/07A/5500/45 UNIT 0	PLANT FIRE Enclosure 17 - Page 5 of 10 AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions	PAGE 101 Rev. 12
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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

11. (Continued)

___ e. Dispatch operator to perform Enclosure 35 (Unit 1 SSF Activation - 1ETA Actions).

___ f. Check all Unit 1 6900V supply breakers - OPEN.

___ g. Perform AP/1/A/5500/24 (Loss Of Plant Control Due To Fire or Sabotage).

___ h. IF AT ANY TIME both units implement AP/24, THEN exit this AP.

___ f. Open all Unit 1 NC pump 6900V supply breakers.

___ 12. IF AT ANY TIME Unit 1 A and B Train controls become ineffective in controlling equipment required for safe shutdown, THEN RETURN TO Step 11.a.

___ 13. Check Unit 2 - IN MODE 1, 2, OR 3.

Perform the following:

___ a. IF AT ANY TIME Unit 2 has lost all seal cooling (seal injection and thermal barrier), THEN ensure all Unit 2 NC pumps are off.

___ b. GO TO Step 16.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION The following continuous action applies even after leaving this AP and takes priority over other EP/AP guidance. Ensure this step is flagged and crew prepared to perform immediately upon loss of all NC pump seal cooling.

NOTE If a blackout causes loss of all NC pump seal cooling and AP07 immediate actions restore seal cooling, the following step does not need to be performed.

14. **IF AT ANY TIME** Unit 2 has lost all seal cooling (seal injection and thermal barrier), **THEN** transfer control of Unit 2 to the SSF as follows:

- ___ a. Dispatch operator to obtain Yellow Folder at SSF and complete Enclosure 1 (Unit 2 SSF - AP-24 Actions) in Yellow folder.
- ___ b. Trip Unit 2 reactor.
- ___ c. Trip all Unit 2 NC pumps.

c. Perform the following:

- ___ 1) Open all Unit 2 NC pump 6900V supply breakers.
- ___ 2) **IF** all NC pumps are off, **THEN GO TO** Step 14.d.
- ___ 3) **IF** NC pump(s) will not trip, **THEN** dispatch RO or other operator in Control Room to trip Unit 2 NC pump(s) from Unit 2 6900V swgr room **PER** Enclosure 38 (Tripping Unit 2 NC Pumps from Unit 2 6900V Swgr Rm).

- ___ d. Check NEO - AVAILABLE FOR DISPATCH IN BACK OF CONTROL ROOM.

d. Perform the following:

- ___ 1) Dispatch operator to obtain Yellow Folder at 2EMXA4 (north wall of Unit 2 ETA Room) and complete Enclosure 2 (Unit 2 EMXA-4 - AP-24 Actions) in Yellow Folder.
- ___ 2) **GO TO** Step 14.f.

MNS
AP/0/A/5500/45
UNIT 0

PLANT FIRE
Enclosure 17 - Page 7 of 10
AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

14. (Continued)

___ e. Dispatch operator to perform Enclosure 37 (Unit 2 SSF Activation - 2ETA Actions).

___ f. Check all Unit 2 NC pump 6900V supply breakers - OPEN.

___ f. Open all Unit 2 NC pump 6900V supply breakers.

___ g. Perform AP/2/A/5500/24 (Loss Of Plant Control Due To Fire or Sabotage).

___ h. IF AT ANY TIME both units implement AP/24, THEN exit this AP.

___ 15. IF AT ANY TIME Unit 2 A and B Train controls become ineffective in controlling equipment required for safe shutdown, THEN RETURN TO Step 14.a.

___ 16. Check Unit 1 - IN MODE 1, 2, OR 3.

___ GO TO Step 18.

17. **CLOSE** the following manual loaders on Unit 1:

___ • CLOSE 1SV-19AB (1A Main Steam Line PORV).

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

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

___ • CLOSE 1SV-1AB (1D Main Steam Line PORV).

MNS
AP/0/A/5500/45
UNIT 0

PLANT FIRE
Enclosure 17 - Page 8 of 10
AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

18. **Maintain communications with Fire Brigade Incident Command AND notify them of any of the following:**

- ☐ • Operator local actions being directed by this procedure
- ☐ • Calls to outside agencies to support ongoing fire fighting activities.

19. **Evaluate shutting down to Mode 3, considering the following:**

- ☐ • IF SSF equipment is not available for safe shutdown, THEN a rapid downpower to Mode 3 may be desired, depending on severity of fire.
- ☐ • IF fire damage is extensive, THEN shutdown to Mode 3 may be desired.

20. **Have station management evaluate Appendix F of MCS-1465.00-00-0022 (Design Basis Specification for the Appendix R Safe Shutdown Analysis) for fire area 19 (Hot Standby Analysis - Cable Spreading Room AB 750' Elevation Unit 1), as time allows for:**

- ☐ • Potential instrumentation malfunctions
- ☐ • Additional equipment malfunctions.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

21. **WHEN** the fire is reduced to a non active status, **THEN** have station management evaluate returning controls to normal as follows:

CAUTION If the SSF has been activated, then reclosing breakers in the next steps may adversely affect SSF operation and should not be performed until the function is not required.

- | | |
|---|--|
| <p>a. Check the following Pzr PORVs - CLOSED:</p> <ul style="list-style-type: none">___ • 1NC-34A (PZR PORV)___ • 1NC-32B (PZR PORV)___ • 1NC-36B (PZR PORV). <p>___ b. OPEN Pzr PORV isolation valves for PORV's that are verified closed.</p> | <p>a. Perform the following:</p> <ul style="list-style-type: none">___ 1) CLOSE Pzr PORV(s).___ 2) IF Pzr PORV will not close, THEN perform the following:<ul style="list-style-type: none">___ a) CLOSE associated Pzr PORV isolation valve.___ b) Dispatch operator to open breaker for closed Pzr PORV isolation valve. |
|---|--|

CAUTION A fire induced hot short may cause valve in next step to operate when power is restored.

- ___ c. Dispatch operator to close breaker 1EMXA4 - 2A (Unit 1 TD CA Pump Suction Isol Motor (1CA-7A)) (north wall 1ETA room).
- ___ d. Ensure 1CA-7AC (U1 TD CA Pump Suction Isol) is in proper position.

MNS
AP/0/A/5500/45
UNIT 0

PLANT FIRE
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AB 750' Unit 1 Cable Spreading Room Fire Unit 1 and 2 Actions

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

21. (Continued)

e. Slowly OPEN the following manual loaders, while ensuring valves remain closed:

- • Slowly OPEN 1SV-19AB (1A Main Steam Line PORV).
- • Slowly OPEN 1SV-13AB (1B Main Steam Line PORV).
- • Slowly OPEN 1SV-7ABC (1C Main Steam Line PORV).
- • Slowly OPEN 1SV-1AB (1D Main Steam Line PORV).

— e. CLOSE manual loader.

— 22. RETURN TO Step 7 in body of this procedure.

SIM JPM G

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Increase Pressure in Cold Leg
Accumulator 1AJPM No.: 2011 Systems - Control
Room JPM G

K/A Reference: 006 A1.07, 3.3/3.6

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of Testing:

Simulated Performance: _____

Actual Performance: XClassroom _____ 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:

- The plant is at 100% power.
- MCB Annunciator 1AD-9, E-1, A COLD LEG ACCUMULATOR ABNORMAL PRESS, has just alarmed.
- 1A Cold Leg Accumulator pressure is approximately 590 psig and holding.

Task Standard:

The operator aligns N₂ to CLA 1A and raises pressure to greater than 620 psig and less than 639 psig.

Required Materials: None

General References: OP/1/A/6200/009 (Accumulator Operation), Rev 98.

Handouts:

Enclosure 4.3 (Adjusting Accumulator Pressures) of OP/1/A/6200/009 (Accumulator Operation) marked up for place-keeping through Step 3.1.

Job Performance Measure Worksheet

Initiating Cue:

- The CRS has directed you to increase the 1A Cold Leg Accumulator pressure to approximately 620 psig per OP/1/A/6200/009 (Accumulator Operation) Enclosure 4.3 (Adjusting Accumulators Pressure).
- N₂ Heaters are not required for makeup.
- NEO (John) is standing by to assist.

Time Critical Task:

No

Validation Time:

8 minutes

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset the Simulator to IC-39 100% Power, MOL
2. Open 1NI-50 and throttle open the manual loader for 1NI-83 to bring CLA A down to the low pressure alarm setpoint (approximately 590 psig)
3. Close 1NI-50 and 1NI-83
4. Freeze the Simulator

OR

1. Reset Simulator to Temporary Snap IC-256 (March, 2011)
2. Momentarily place Simulator in Run to acknowledge alarms.
3. Leave Simulator in FREEZE until operator is ready to begin.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 4.3 of OP/1/A/6200/009 marked up for place-keeping through Step 3.1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 3.1) Evaluate all outstanding R&R's that may impact the performance of this procedure.	The operator recognizes from the initial conditions that this action is complete.		
2	(Step 3.2) Perform the following sections as applicable: Section 3.3, Increasing Accumulator Pressure Section 3.4, Decreasing Accumulator Pressure Section 3.5, Adjusting Accumulator Pressure via Equalization	The operator proceeds to Section 3.3.		
3	(NOTE prior to Step 3.3) IF CLAs have been completely depressurized, CLA Nitrogen Heater is required.	The operator reads the NOTE, recognizes that it does NOT apply, and proceeds.		
4	(Step 3.3) Increasing accumulator pressure (Step 3.3.1) Ensure that 1NI-83 (CL Accum N2 Hdr Atmos Vent Isol) closed.	The operator observes the 1NI-83 controller output at 0%.		
5	(Step 3.3.2) IF required, start the Cold Leg Accumulator Nitrogen Heater...	The operator recognizes that the heaters are NOT required, and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*6	(Step 3.3.3) Open 1NI-47A (Rx Bldg N ₂ Supply Isol)	The operator presses the 1NI-47A OPEN pushbutton and observes the Red status light LIT, Green status light OFF.		
7	(NOTEs prior to Step 3.3.4) To maintain Tech Spec operability, only one CLA at a time can have associated liquid fill valve, gas fill valve, or sample valve open. If LTOP in service, only A or B CLA can have associated liquid fill valve, gas fill valve, or sample valve open at a time.	The operator reads the NOTEs and proceeds.		
*8	(Step 3.3.4) If increasing pressure in A CLA, perform the following: (Step 3.3.4.1) Adjust 650 psig Nitrogen regulator at Bulk Nitrogen House to a Pressure adequate for makeup to A CLA: 1GN-38 (650 psig Nitrogen Hdr Press Reg) OR 1GN-41 (650 psig Nitrogen Hdr Press Backup Reg)	<p>The operator contacts the NEO, and directs that Nitrogen pressure be adjusted to 650 psig.</p> <p>Cue:</p> <p>The NEO reports that 1GN-38 has been adjusted so that Nitrogen pressure is 650 psig.</p>		
*9	(Step 3.3.4.2) Open 1NI-50 (A CL Accum N ₂ Supply Isol).	The operator presses the 1NI-50 OPEN pushbutton and observes the Red status light LIT, Green status light OFF.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	(Step 3.3.4.3) After CLA at desired pressure, back out 650 psig Nitrogen Regulator at Bulk Nitrogen House. 1GN-38 (650 psig Nitrogen Hdr Press Reg) OR 1GN-41 (650 psig Nitrogen Hdr Press Backup Reg)	The operator contacts the NEO, and directs that 1GN-38 be backed out. Cue: The NEO reports that 1GN-38 has been backed out.		
*11	(Step 3.3.4.4) Close 1NI-50 (A CL Accum N2 Supply Isol).	The operator presses the 1NI-50 CLOSE pushbutton and observes the Green status light LIT, Red status light OFF.		
12	(Step 3.3.5) If increasing pressure in B CLA,.....	The operator recognizes that the B CLA pressure is NOT being raised, and proceeds.		
13	(Step 3.3.6) If increasing pressure in C CLA,.....	The operator recognizes that the C CLA pressure is NOT being raised, and proceeds.		
14	(Step 3.3.7) If increasing pressure in D CLA,.....	The operator recognizes that the D CLA pressure is NOT being raised, and proceeds.		
15	(Step 3.3.8) Close 1NI-47A (Rx Bldg N ₂ Supply Isol)	The operator presses the 1NI-47A CLOSE pushbutton and observes the Green status light LIT, Red status light OFF.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
16	(Step 3.3.9) If required, turn off Unit 1 & 2 NI Accum N2 HTR.....	The operator reads the NOTE, recognizes that it does NOT apply, and proceeds.		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 Systems - Control Room JPM G

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- The plant is at 100% power.
- MCB Annunciator 1AD-9, E-1, A COLD LEG ACCUMULATOR ABNORMAL PRESS, has just alarmed.
- 1A Cold Leg Accumulator pressure is approximately 590 psig and holding.

INITIATING CUE:

- The CRS has directed you to increase the 1A Cold Leg Accumulator pressure to approximately 620 psig per OP/1/A/6200/009 (Accumulator Operation) Enclosure 4.3 (Adjusting Accumulators Pressure).
- N₂ Heaters are not required for makeup.
- NEO (John) is standing by to assist.

Duke Energy
McGuire Nuclear Station
Accumulator Operation

Procedure No.

OP/1/A/6200/009

Revision No.

100

Electronic Reference No.

MC00474G

Continuous Use

PERFORMANCE

***** UNCONTROLLED FOR PRINT *****

(ISSUED) - PDF Format

Enclosure 4.3
Adjusting Accumulator Pressures

OP/1/A/6200/009
Page 1 of 7

1. Limits and Precautions

- 1.1 **WHEN** CLA(s) pressurized, minimum temperature of CLA(s) is 60°F.

2. Initial Conditions

- 2.1 GN System aligned per OP/0/B/6450/008 (Nitrogen System).
- 2.2 CLA Level within proper Tech Spec range.

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, Increasing CLA Pressure
 - ☐ Section 3.4, Decreasing CLA Pressure
 - ☐ Section 3.5, Adjusting CLA Pressure Via Equalization

NOTE: IF CLAs have been completely depressurized, CLA Nitrogen Heater is required.
--

3.3 Increasing CLA Pressure

- 3.3.1 Ensure 1NI-83 (CL Accum N₂ Hdr Atmos Vent Isol) closed.
- 3.3.2 **IF** required, start Unit 1 & 2 NI Accum N₂ HTR as follows:
- 3.3.2.1 Close local breaker at Nitrogen Heater Panel.
 - 3.3.2.2 Start Unit 1 & 2 NI Accum N₂ HTR.
 - 3.3.2.3 Set thermostat to control heater outlet temperature 70 - 75°F.
- 3.3.3 Open 1NI-47A (Rx Bldg N₂ Supply Isol).

Unit 1

Enclosure 4.3
Adjusting Accumulator Pressures

OP/1/A/6200/009
Page 2 of 7

- NOTE:**
- To maintain Tech Spec operability, only one CLA at a time can have associated liquid fill valve, gas fill valve or sample valve open.
 - **IF** LTOP in service, only "A" or "B" CLA can have associated liquid fill valve, gas fill valve or sample valve open at a time.

_____ 3.3.4 **IF** increasing pressure in "A" CLA, perform the following:

 3.3.4.1 Adjust 650 psig Nitrogen regulator at Bulk Nitrogen House to a pressure adequate for makeup to "A" CLA:

- _____ • 1GN-38 (650 psig Nitrogen Hdr Press Reg)

OR

- _____ • 1GN-41 (650 psig Nitrogen Hdr Press Backup Reg)

_____ 3.3.4.2 Open 1NI-50 (A CL Accum N₂ Supply Isol).

_____ 3.3.4.3 **AFTER** CLA at desired pressure, back out 650 psig Nitrogen Regulator at Bulk Nitrogen House.

- _____ • 1GN-38 (650 psig Nitrogen Hdr Press Reg)

OR

- _____ • 1GN-41 (650 psig Nitrogen Hdr Press Backup Reg)

_____ 3.3.4.4 Close 1NI-50 (A CL Accum N₂ Supply Isol).

Adjusting Accumulator Pressures

- _____ 3.3.5 **IF** increasing pressure in "B" CLA, perform the following:
- 3.3.5.1 Adjust 650 psig Nitrogen regulator at Bulk Nitrogen House to a pressure adequate for makeup to "B" CLA:
- _____ • 1GN-38 (650 psig Nitrogen Hdr Press Reg)
- OR
- _____ • 1GN-41 (650 psig Nitrogen Hdr Press Backup Reg)
- _____ 3.3.5.2 Open 1NI-61 (B CL Accum N₂ Supply Isol).
- _____ 3.3.5.3 **AFTER** CLA at desired pressure, back out 650 psig Nitrogen Regulator at Bulk Nitrogen House.
- _____ • 1GN-38 (650 psig Nitrogen Hdr Press Reg)
- OR
- _____ • 1GN-41 (650 psig Nitrogen Hdr Press Backup Reg)
- _____ 3.3.5.4 Close 1NI-61 (B CL Accum N₂ Supply Isol).

Adjusting Accumulator Pressures

_____ 3.3.6 **IF** increasing pressure in "C" CLA, perform the following:

3.3.6.1 Adjust 650 psig Nitrogen regulator at Bulk Nitrogen House to a pressure adequate for makeup to "C" CLA:

- _____ • 1GN-38 (650 psig Nitrogen Hdr Press Reg)

OR

- _____ • 1GN-41 (650 psig Nitrogen Hdr Press Backup Reg)

_____ 3.3.6.2 Open 1NI-72 (C CL Accum N₂ Supply Isol).

_____ 3.3.6.3 **AFTER** CLA at desired pressure, back out 650 psig Nitrogen Regulator at Bulk Nitrogen House.

- _____ • 1GN-38 (650 psig Nitrogen Hdr Press Reg)

OR

- _____ • 1GN-41 (650 psig Nitrogen Hdr Press Backup Reg)

_____ 3.3.6.4 Close 1NI-72 (C CL Accum N₂ Supply Isol).

Adjusting Accumulator Pressures

- _____ 3.3.7 **IF** increasing pressure in "D" CLA, perform the following:
- 3.3.7.1 Adjust 650 psig Nitrogen regulator at Bulk Nitrogen House to a pressure adequate for makeup to "D" CLA:
- _____ • 1GN-38 (650 psig Nitrogen Hdr Press Reg)
- OR
- _____ • 1GN-41 (650 psig Nitrogen Hdr Press Backup Reg)
- _____ 3.3.7.2 Open 1NI-84 (D CL Accum N₂ Supply Isol).
- _____ 3.3.7.3 **AFTER** CLA at desired pressure, back out 650 psig Nitrogen Regulator at Bulk Nitrogen House.
- _____ • 1GN-38 (650 psig Nitrogen Hdr Press Reg)
- OR
- _____ • 1GN-41 (650 psig Nitrogen Hdr Press Backup Reg)
- _____ 3.3.7.4 Close 1NI-84 (D CL Accum N₂ Supply Isol).
- _____ 3.3.8 Close 1NI-47A (Rx Bldg N₂ Supply Isol).
- _____ 3.3.9 **IF** required, turn off Unit 1 & 2 NI Accum N₂ HTR as follows:
- _____ 3.3.9.1 Stop Unit 1 & 2 NI Accum N₂ HTR.
- _____ 3.3.9.2 Open local breaker at heater panel.

Adjusting Accumulator Pressures

3.4 Decreasing CLA Pressure

- _____ 3.4.1 **IF** VP **NOT** in service **AND** a large quantity of nitrogen gas will be vented into containment, evaluate personnel safety from venting nitrogen into area of 1NI-83 (CL Accum N₂ Hdr Atmos Vent Isol) (25' Above Inside of Lower Personnel Hatch).

- NOTE:**
- To maintain Tech Spec operability, only one CLA at a time can have associated liquid fill valve, gas fill valve or sample valve open.
 - **IF** LTOP in service, only "A" or "B" CLA can have associated liquid fill valve, gas fill valve or sample valve open at a time.
 - **IF** LTOP in service, minimum pressure for "A" and "B" CLAs is 200 psig.

- _____ 3.4.2 **IF** decreasing pressure in "A" CLA, perform the following:

- _____ 3.4.2.1 Open 1NI-50 (A CL Accum N₂ Supply Isol).
- _____ 3.4.2.2 Throttle open 1NI-83 (CL Accum Hdr Atmos Vent Isol).
- _____ 3.4.2.3 **AFTER** CLA at desired pressure, close 1NI-50 (A CL Accum N₂ Supply Isol).
- _____ 3.4.2.4 Close 1NI-83 (CL Accum N₂ Hdr Atmos Vent Isol).

- _____ 3.4.3 **IF** decreasing pressure in "B" CLA, perform the following:

- _____ 3.4.3.1 Open 1NI-61 (B CL Accum N₂ Supply Isol).
- _____ 3.4.3.2 Throttle open 1NI-83 (CL Accum N₂ Hdr Atmos Vent Isol).
- _____ 3.4.3.3 **AFTER** CLA at desired pressure, close 1NI-61 (B CL Accum N₂ Supply Isol).
- _____ 3.4.3.4 Close 1NI-83 (CL Accum N₂ Hdr Atmos Vent Isol).

Adjusting Accumulator Pressures

- _____ 3.4.4 **IF** decreasing pressure in "C" CLA, perform the following:
- _____ 3.4.4.1 Open 1NI-72 (C CL Accum N₂ Supply Isol).
- _____ 3.4.4.2 Throttle open 1NI-83 (CL Accum N₂ Hdr Atmos Vent Isol).
- _____ 3.4.4.3 **AFTER** CLA at desired pressure, close 1NI-72 (C CL Accum N₂ Supply Isol).
- _____ 3.4.4.4 Close 1NI-83 (CL Accum N₂ Hdr Atmos Vent Isol).
- _____ 3.4.5 **IF** decreasing pressure in "D" CLA, perform the following:
- _____ 3.4.5.1 Open 1NI-84 (D CL Accum N₂ Supply Isol).
- _____ 3.4.5.2 Throttle open 1NI-83 (CL Accum N₂ Hdr Atmos Vent Isol).
- _____ 3.4.5.3 **AFTER** CLA at desired pressure, close 1NI-84 (D CL Accum N₂ Supply Isol).
- _____ 3.4.5.4 Close 1NI-83 (CL Accum N₂ Hdr Atmos Vent Isol).

3.5 Adjusting CLA Pressure Via Equalization

- _____ 3.5.1 Check CLAs **NOT** required operable by Tech Specs.
- SRO _____ 3.5.2 Ensure closed 1NI-83 (CL Accum N₂ Hdr Atmos Vent Isol).
- _____ 3.5.3 Open applicable CLA supply valve(s):
- _____ • 1NI-50 (A CL Accum N₂ Supply Isol)
 - _____ • 1NI-61 (B CL Accum N₂ Supply Isol)
 - _____ • 1NI-72 (C CL Accum N₂ Supply Isol)
 - _____ • 1NI-84 (D CL Accum N₂ Supply Isol)
- _____ 3.5.4 **AFTER** CLA at desired pressure, close applicable CLA supply valves:
- _____ • 1NI-50 (A CL Accum N₂ Supply Isol)
 - _____ • 1NI-61 (B CL Accum N₂ Supply Isol)
 - _____ • 1NI-72 (C CL Accum N₂ Supply Isol)
 - _____ • 1NI-84 (D CL Accum N₂ Supply Isol)

End of Enclosure

SIM JPM H

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Restore Power to 6900V BusesJPM No.: 2011 Systems - Control Room JPM H

K/A Reference: 062 A2.05 (2.9/3.3)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: X Classroom _____ Simulator X Plant _____**READ TO THE EXAMINEE**

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

Initial Conditions:

- A total loss of Offsite Power has occurred at both Units.
- Unit 1 tripped from 100% power.
- Unit 2 is in Mode 5.
- Unit 1 has implemented AP/1/A/5500/07 (Loss of Electrical Power), Case I (Loss of Normal Power to 1ETA and 1ETB).
- Power has been restored to the Unit 1 Switchyard.
- The crew is preparing to restore power to the 6900VAC Buses, and is complete through Step 43.m.

Task Standard: The operator re-energizes all four 6900V Buses per AP/1/A/5500/07.

Required Materials: None

General References: AP/1/A/5500/07 (Loss of Electrical Power), Rev 29
EP/1/A/5000/E-0 (Reactor Trip or Safety Injection), Rev 30
EP/1/A/5000/ES-0.1 (Reactor Trip Response), Rev 31

Handouts: AP/1/A/5500/07 (Loss of Electrical Power)

Job Performance Measure Worksheet

Initiating Cue: The CRS has directed you to restore power to the 6900V buses by performing Steps 43.n-q of AP/1/A/5500/07 (Loss of Electrical Power), Case I (Loss of Normal Power to 1ETA and 1ETB) using the Normal Supply breakers.

Toddville has indicated that all Unit 1 Switchyard PCBs are available, and has given permission to close them as needed.

Time Critical Task: No

Validation Time: 8 minutes

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset to IC-39 (100% Steady-state)
2. Insert the following malfunctions:
MALF-EP001 Station Blackout
3. Place Simulator in Run and acknowledge Annunciator Alarms.
4. Implement EP/1/A/5000/E-0, EP/1/A/5000/ES-0.1 and AP/1/A/5500/07, Case I through Step 43.m.
5. Stabilize plant.
6. Remove MALF-EP001
7. Acknowledge alarms and Freeze the Simulator.

OR

1. Reset Simulator to Temporary Snap IC-257 (March, 2011)
2. Momentarily place Simulator in Run to acknowledge alarms.
3. Leave Simulator in FREEZE until operator is ready to begin.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout AP/1/A/5500/07.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(43.n) Check the following MODs – CLOSED: <ul style="list-style-type: none"> • MOD-8R • MOD-8Y • MOD-9R • MOD-9Y • MOD-11R • MOD-11Y • MOD-12R • MOD-12Y 	<p>The operator observes the MOD-8R Red status light LIT, Green status light OFF.</p> <p>The operator observes the MOD-8Y Red status light LIT, Green status light OFF.</p> <p>The operator observes the MOD-9R Red status light LIT, Green status light OFF.</p> <p>The operator observes the MOD-9Y Red status light LIT, Green status light OFF.</p> <p>The operator observes the MOD-11R Red status light LIT, Green status light OFF.</p> <p>The operator observes the MOD-11Y Red status light LIT, Green status light OFF.</p> <p>The operator observes the MOD-12R Red status light LIT, Green status light OFF.</p> <p>The operator observes the MOD-12Y Red status light LIT, Green status light OFF.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	<p>(Step 43.o) Check switch indications for the following 6900V switchgear breakers –LIT:</p> <ul style="list-style-type: none"> • “1TA NORMAL BREAKER” • “1TA STDBY BREAKER” • “1TB NORMAL BREAKER” • “1TB STDBY BREAKER” • “1TC NORMAL BREAKER” • “1TC STDBY BREAKER” • “1TD NORMAL BREAKER” • “1TD STDBY BREAKER” 	<p>The operator observes the 1TA normal bkr Green status light LIT, Red status light OFF.</p> <p>The operator observes the 1TA standby bkr Green status light LIT, Red status light OFF.</p> <p>The operator observes the 1TB normal bkr Green status light LIT, Red status light OFF.</p> <p>The operator observes the 1TB standby bkr Green status light LIT, Red status light OFF.</p> <p>The operator observes the 1TC normal bkr Green status light LIT, Red status light OFF.</p> <p>The operator observes the 1TC standby bkr Green status light LIT, Red status light OFF.</p> <p>The operator observes the 1TD normal bkr Green status light LIT, Red status light OFF.</p> <p>The operator observes the 1TD standby bkr Green status light LIT, Red status light OFF.</p>		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	(Step 43.p) Close available PCBs as directed by Toddville TCC.			
	<ul style="list-style-type: none"> PCB8 	<p>The operator presses the CLOSE pushbutton for PCB8 and observes the Red status light LIT and Green status light OFF (The 1A Transformer voltage will rise to 24KV).</p>		
*				
	<ul style="list-style-type: none"> PCB9 	<p>The operator presses the CLOSE pushbutton for PCB9 and observes the Red status light LIT and Green status light OFF.</p>		
		<p>NOTE:</p> <p>Closing either PCB8 or 9 satisfies the Critical nature of this step.</p>		
	<ul style="list-style-type: none"> PCB11 	<p>The operator presses the CLOSE pushbutton for PCB11 and observes the Red status light LIT and Green status light OFF (The 1B Transformer voltage will rise to 24KV).</p>		
*				
	<ul style="list-style-type: none"> PCB12 	<p>The operator presses the CLOSE pushbutton for PCB12 and observes the Red status light LIT and Green status light OFF.</p>		
		<p>NOTE:</p> <p>Closing either PCB11 or 12 satisfies the Critical nature of this step.</p>		





PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	(Step 43.q.1) WHEN busline energized, THEN energize 6900V busses as follows: Check electrical grid –HAS REMAINED ENERGIZED DURING THIS EVENT.	The operator observes that both Transformer 1A and 1B voltage is 24KV (MCB or OAC) and determines that 6900V can be energized.		
		Cue: Toddville reports that the Grid has remained energized throughout this event.		
*5	(Step 43.q.2) Close the normal or standby breaker on de-energized busses: • 1TA • 1TB • 1TC • 1TD.	<p>The operator presses the CLOSE pushbutton for 1TA normal breaker and observes the Red status light LIT, Green status light OFF.</p> <p>The operator presses the CLOSE pushbutton for 1TB normal breaker and observes the Red status light LIT, Green status light OFF.</p> <p>The operator presses the CLOSE pushbutton for 1TC normal breaker and observes the Red status light LIT, Green status light OFF.</p> <p>The operator presses the CLOSE pushbutton for 1TD normal breaker and observes the Red status light LIT, Green status light OFF.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*6	(Step 43.q.3) Place the mode select switches for the following 6900V busses in auto: <ul style="list-style-type: none">• 1TA• 1TB• 1TC• 1TD.	The operator places the 1TA Mode Select Switch to AUTO. The operator places the 1TB Mode Select Switch to AUTO. The operator places the 1TC Mode Select Switch to AUTO. The operator places the 1TD Mode Select Switch to AUTO.		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 Systems - Control Room JPM H

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A total loss of Offsite Power has occurred at both Units.
- Unit 1 tripped from 100% power.
- Unit 2 is in Mode 5.
- Unit 1 has implemented AP/1/A/5500/07 (Loss of Electrical Power), Case I (Loss of Normal Power to 1ETA and 1ETB).
- Power has been restored to the Unit 1 Switchyard.
- The crew is preparing to restore power to the 6900VAC Buses, and is complete through Step 43.m.

INITIATING CUE:

The CRS has directed you to restore power to the 6900V buses by performing Steps 43.n-q of AP/1/A/5500/07 (Loss of Electrical Power), Case I (Loss of Normal Power to 1ETA and 1ETB) using the Normal Supply breakers.

Toddville has indicated that all Unit 1 Switchyard PCBs are available, and has given permission to close them as needed.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

43. (Continued)

m. Do not continue until the following are complete:

- ___ • Steps 43.k through 43.l
- ___ • Enclosure 15 (Control Room Actions for Power Restoration)
- ___ • Enclosure 16 (Preparing 6900V Busses for Power Restoration)
- ___ • Enclosure 17 (Preparing 600V Loads for Power Restoration).

n. Check the following MODs - CLOSED:

- ___ • MOD-8R
- ___ • MOD-8Y
- ___ • MOD-9R
- ___ • MOD-9Y
- ___ • MOD-11R
- ___ • MOD-11Y
- ___ • MOD-12R
- ___ • MOD-12Y.

n. Perform the following:

- ___ 1) **IF** sufficient number of MODs are already closed to support power restoration, **THEN GO TO** Step 43.o.
- ___ 2) Dispatch operator (or Switchyard personnel) to check all three phases of MODs properly close.
- ___ 3) Close desired MODs as directed by Toddville TCC.
- ___ 4) Do not continue until desired MODs are properly aligned to support power restoration.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

43. (Continued)

- o. Check switch indications for the following 6900V switchgear breakers - LIT:

- ___ • "1TA NORMAL BREAKER"
- ___ • "1TA STDBY BREAKER"
- ___ • "1TB NORMAL BREAKER"
- ___ • "1TB STDBY BREAKER"
- ___ • "1TC NORMAL BREAKER"
- ___ • "1TC STDBY BREAKER"
- ___ • "1TD NORMAL BREAKER"
- ___ • "1TD STDBY BREAKER".

- o. Perform the following:

NOTE

- If aux control power batteries were intentional removed from service per Enclosure 7 (DC Bus Alignment), then aux control power batteries will supply breaker control power and relaying for a limited period of time after battery output breakers are reclosed.
- Aux control power battery chargers should automatically start once 6900V switchgear are energized in Step 43.q.

- 1) Dispatch operator to ensure the following battery output breakers are closed:

- ___ • DCA-4B (CXA Battery to DCA Dist Center Feeder)
- ___ • DCB-4B (CXB Battery to DCB Dist Center Feeder).

- ___ 2) Do not continue until battery output breakers are closed.

- ___ 3) Depress "STOP" on B RF pump to ensure breaker is open.

(RNO continued on next page)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

43. (Continued)

p. Close available PCBs as directed by
Toddville TCC.

- ___ • PCB 8
- ___ • PCB 9
- ___ • PCB 11
- ___ • PCB 12.

- ___ 4) **IF** any load center feeder breaker was left open while performing Step 4 of Enclosure 16 (Preparing 6900V Busses for Power Restoration), **THEN** evaluate closing breaker now.
- ___ 5) **IF** any load center incoming breaker was left open while performing Step 6 of Enclosure 17 (Preparing 600V Loads for Power Restoration), **THEN** evaluate closing breaker now.

p. Perform the following:

- ___ 1) Contact Switchyard coordinator or dispatch operator to close desired PCBs from switchyard **PER** Step 43.f.
- ___ 2) **IF** PCB(s) fail to operate, **THEN** notify Switchyard coordinator to evaluate status of switchyard control power.
- ___ 3) Do not continue until at least one busline is energized.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

43. (Continued)

q. **WHEN** busline energized, **THEN**
energize 6900V busses as follows:

___ 1) Check electrical grid - HAS
REMAINED ENERGIZED DURING
THIS EVENT.

1) **IF** total loss of Duke grid occurred
during this event, **THEN** perform the
following:

a) **WHEN** energizing 6900V
switchgear in next step, **THEN**
perform the following:

- ___ • Maintain constant
communication with Toddville
TCC while 6900V switchgear
are being energized.
- ___ • Notify Toddville TCC that
approximately 500-1000 KW
of load will be added to the
grid each time a 6900V
switchgear is energized.
- ___ • Wait until Toddville TCC
confirms switchyard frequency
and voltage are stable prior to
energizing each 6900V
switchgear.

___ b) **WHEN** all 6900V busses have
been energized, **THEN** notify
Toddville TCC that 2 MWs of
additional load will be added to
the grid over the next hour as
unit MCCs are energized one at
a time.

2) Close the normal or standby breaker
on de-energized busses:

- ___ • 1TA
- ___ • 1TB
- ___ • 1TC
- ___ • 1TD.

3) Place the mode select switches for
the following 6900V busses in auto:

- ___ • 1TA
- ___ • 1TB
- ___ • 1TC
- ___ • 1TD.

In-Plant JPM I

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Start and Stop # 1 Turbine Driven
CA PumpJPM No.: 2011 Systems – In-
Plant JPM I

K/A Reference: 061 A2.04 (3.4/3.8)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:Simulated Performance: X Actual Performance: Classroom Simulator Plant X **READ TO THE EXAMINEE**

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

- Initial Conditions:
- Unit 1 is at 98% power when the OAC alarm M1A1276 (U1 CA Temp at Chk Vlv 1CA-37) is received.
 - The RO reports that the temperature in the TD CA Pump discharge to 1D S/G is 223°F.
 - The CRS has determined the #1 Turbine Driven CA Pump should be started to cool the piping to 1D S/G.

Task Standard: #1 TD CA Pump is started and valves aligned to provide cooling.

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

General References: OP/1/A/6250/002 (Auxiliary Feedwater System), Rev 114

Handouts: Enclosure 4.4 (Manual Operation of #1 TD CA Pump) of
OP/1/A/6250/002 (Auxiliary Feedwater System), marked up so that
steps 3.1 and 3.2 are complete.

Job Performance Measure Worksheet

Initiating Cue:

- The CRS directs you to locally start Unit 1 Turbine Driven CA Pump per OP/1/A/6250/002, Enclosure 4.4 using a "Normal" start.
- The Initial Conditions have been met and all R&Rs have been evaluated.
- A Pre-job Brief discussing reactivity management concerns has been performed.

Time Critical Task:

NO

Validation Time:

10 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 4.4 of OP/1/A/6250/002, marked up so that steps 3.1 and 3.2 are complete.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 3.3) IF #1 TD CA Pump to be operated locally, obtain key #172.	The operator should go to the Work Control Center to obtain a key, or will describe where to obtain the key.		
		Cue: Key 172 has been obtained.		
		NOTE: Key 172 will not be needed to complete this JPM due the clear plexiglass cover on the Control Panel.		
2	(Step 3.4) Perform the following sections as applicable: <ul style="list-style-type: none"> Section 3.5, Starting #1 TD CA Pump. Section 3.6, Stopping #1 TD CA Pump. 	The operator proceeds to Section 3.5		
3	(Step 3.5) Starting #1 TD CA Pump (Step 3.5.1) Notify RP of #1 TD CA Pump start.	The operator notifies RP.		
		Cue: RP Mike Mullen has been contacted.		
		The operator documents the name, current date & time.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	(Step 3.5.2) IF in Modes 1-3, declare #1 TD CA Pump inoperable.	The operator calls the CR or WCC to inform the CRS of TD CA Pump inoperability.		
		Cue: The CRS reports that the TD pump has been declared inoperable. Initials <u>BP</u>		
5	(Step 3.5.3) IF operating #1 TD CA Pump locally, perform the following at "Turbine Driven CA Pump Control Panel": <ul style="list-style-type: none"> (Step 3.5.3.1) Place "#1 TD CA Pump" in "LOCAL". (Step 3.5.3.2) Place the following in "M-Local": <ul style="list-style-type: none"> 1CA-64AB (TD CA Pump to S/G A) 1CA-52AB (TD CA Pump to S/G B) 1CA-48AB (TD CA Pump to S/G C) 1CA-36AB (TD CA Pump to S/G D) 	The operator rotates the C/R LOCAL Switch for the "#1 TD CA Pump" clockwise.		
		Cue: The Switch is in the LOCAL position and the White LOCAL light is LIT.		
		The operator moves the "M-Local" switch for each valve downward.		
		Cue: The Switch for each valves controller is in the M-LOCAL position.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
* 6	(Step 3.5.4) Close the following: <ul style="list-style-type: none"> • 1CA-64AB (TD CA Pump to S/G A) • 1CA-52AB (TD CA Pump to S/G B) • 1CA-48AB (TD CA Pump to S/G C) • 1CA-36AB (TD CA Pump to S/G D) 	The operator rotates the control knob for each valve counter-clockwise. Cue: Knob rotation counter-clockwise and the black needle indicates 0%, and that the Green "Closed" light is LIT for each valve.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	<p>(Step 3.5.5) Drain moisture from #1 CA Pump Turbine stop valve as follows:</p> <p>(Step 3.5.5.1) Slowly open the following:</p> <ul style="list-style-type: none"> 1SA-39 (Unit 1 TD CA Pump Turb Stop Valve Above Seat Drn) 1SA-40 (Unit 1 TD CA Pump Turb Stop Valve Below Seat Drn) <p>(Step 3.5.5.2) AFTER 30 seconds elapsed, close the following:</p> <ul style="list-style-type: none"> 1SA-39 (Unit 1 TD CA Pump Turb Stop Valve Above Seat Drn) 1SA-40 (Unit 1 TD CA Pump Turb Stop Valve Below Seat Drn) <p>(Step 3.5.5.3) IF water hammer occurred while draining moisture from #1 CA Pump Turbine Stop Valve.....</p>	The operator rotates the handwheel counterclockwise for each valve.		
		Cue: The hand wheel has been rotated fully counter-clockwise.		
		After 30 seconds, the operator rotates the handwheel clockwise for each valve.		
		Cue: The hand wheel has been rotated fully clockwise for each valve.		
		Cue: If asked, indicate that no unusual noises, popping, or vibration occurred during draining.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
8	(Step 3.5.6) Check the following open: <ul style="list-style-type: none"> 1CA-2 (Unit 1 CA Pumps Suct From CA Storage Tank Isol) 1CA-7A (Unit 1 TD CA Pump Suction Isol) 	The operator observes the 1CA-2 status light.		
		Cue: The RED "Open" light is LIT.		
		The operator observes the 1CA-7A status light.		
		Cue: The RED "Open" light is LIT.		
9	(Caution prior to Step 3.5.7) Starting the TD CA Pump will increase Rx Power due to increased steam flow. Reducing turbine generator load may be required to maintain power level.	The operator reads the Caution and proceeds.		
10	(Notes prior to Step 3.5.7) <ul style="list-style-type: none"> It is preferred to perform a normal start of the TD CA Pump IF a slow start of the TD CA Pump is to be performed, Engineering should be available to provide guidance. 	The operator reads the Notes and proceeds.		
11	(Step 3.5.7) Start #1 TD CA Pump per Step 3.5.7.1 or 3.5.7.2 (N/A step NOT performed)	Operator recognizes (from initial conditions) that a Normal start is desired and proceeds to step 3.5.7.1		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
12	(Step 3.5.7.1) IF normal start desired, perform the following:	The operator rotates the "#1 TD CA Pump" clockwise.		
*	<ul style="list-style-type: none"> (Step 3.5.7.1.A) Place "#1 TD CA Pump" in "START". 	Cue: The Switch is in the "START" position.		
	<ul style="list-style-type: none"> (Step 3.5.7.1.B) Check the following open: <ul style="list-style-type: none"> 1SA-48ABC (1C S/G SM Supply to U1 TD CA Pump Turb Isol) 	The operator observes the 1SA-48ABC status light. Cue: The RED "Open" light is LIT.		
	<ul style="list-style-type: none"> 1SA-49AB (1B S/G SM Supply to U1 TD CA Pump Turb Isol) 	The operator observes the 1SA-49AB status light. Cue: The RED "Open" light is LIT.		
	<ul style="list-style-type: none"> (Step 3.5.7.1.C) Check recirc valve opens by "FLOW" lit. 	The operator observes the recirc valve status light. Cue: The RED "Flow" status light is LIT.		
	<ul style="list-style-type: none"> (Step 3.5.7.1.D) IF operating CA Pump to cool piping, allow pump to run for at least 10 minutes 	Cue: Another Operator will complete this procedure.		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 Systems – In-Plant JPM I

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 is at 98% power when the OAC alarm M1A1276 (U1 CA Temp at Chk Vlv 1CA-37) is received.
- The RO reports that the temperature in the TD CA Pump discharge to 1D S/G is 223°F.
- The CRS has determined the #1 Turbine Driven CA Pump should be started to cool the piping to 1D S/G.

INITIATING CUE:

- The CRS directs you to locally start Unit 1 Turbine Driven CA Pump per OP/1/A/6250/002, Enclosure 4.4 using a "Normal" start.
- The Initial Conditions have been met and all R&Rs have been evaluated.
- A Pre-job Brief discussing reactivity management concerns has been performed.

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

Duke Energy
McGuire Nuclear Station
Auxiliary Feedwater System

Procedure No.

OP/1/A/6250/002

Revision No.

114

Electronic Reference No.

MC00474R

Multiple Use

PERFORMANCE

***** UNCONTROLLED FOR PRINT *****

(ISSUED) - PDF Format

Manual Operation of #1 TD CA Pump

1. Limits and Precautions~~1.1~~

This procedure has the potential to be Reactivity Management related because it controls activities that could affect core reactivity by changing NC system temperature. (R.M.)

2. Initial Conditions2.1

IF starting #1 TD CA Pump, CA Storage Tank level greater than 20 feet.

2.2

BW System isolated from S/Gs per OP/1/A/6100/SO-5A (B, C, D) (Draining S/G 1A, 1B, 1C, 1D).

2.3

1AD-5, H3 (CA MOD Valves In Local Reset) dark.

3. Procedure☒ 3.1

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

3.2

Ensure that a pre-job briefing has been performed that includes discussion of reactivity management concerns with this procedure.

SRO

3.3

IF #1 TD CA Pump to be operated locally, obtain key #172.

3.4

Perform the following sections, as applicable:

☐ Section 3.5, Starting #1 TD CA Pump

☐ Section 3.6, Stopping #1 TD CA Pump

Manual Operation of #1 TD CA Pump

3.5 Starting #1 TD CA Pump

_____ 3.5.1 Notify RP of #1 TD CA Pump start.

_____ / _____
 Person Notified Date Time

_____ 3.5.2 **IF** in Modes 1 - 3, declare #1 TD CA Pump inoperable.
 SRO

_____ 3.5.3 **IF** operating #1 TD CA Pump locally, perform the following at "Turbine Driven CA Pump Control Panel":

_____ 3.5.3.1 Place "#1 TD CA Pump" in "LOCAL".

3.5.3.2 Place the following in "M-Local":

- _____ • 1CA-64 (TD CA Pump To S/G A)
 CV
- _____ • 1CA-52 (TD CA Pump To S/G B)
 CV
- _____ • 1CA-48 (TD CA Pump To S/G C)
 CV
- _____ • 1CA-36 (TD CA Pump To S/G D)
 CV

3.5.4 Close the following:

- _____ • 1CA-64AB (U1 TD CA Pump Disch to 1A S/G Control)
 CV
- _____ • 1CA-52AB (U1 TD CA Pump Disch to 1B S/G Control)
 CV
- _____ • 1CA-48AB (U1 TD CA Pump Disch to 1C S/G Control)
 CV
- _____ • 1CA-36AB (U1 TD CA Pump Disch to 1D S/G Control)
 CV

Manual Operation of #1 TD CA Pump

3.5.5 Drain moisture from #1 CA Pump Turbine stop valve as follows:

3.5.5.1 Slowly open the following:

- _____ • 1SA-39 (Unit 1 TD CA Pump Turb Stop Valve Above Seat Drn)
- _____ • 1SA-40 (Unit 1 TD CA Pump Turb Stop Valve Below Seat Drn)

_____ 3.5.5.2 **AFTER** 30 seconds elapsed, close the following:

- _____ • 1SA-39 (Unit 1 TD CA Pump Turb Stop Valve Above Seat Drn)
- _____ • 1SA-40 (Unit 1 TD CA Pump Turb Stop Valve Below Seat Drn)

_____ 3.5.5.3 **IF** water hammer occurred while draining moisture from #1 CA Pump Turbine Stop Valve, notify System Engineer.

_____/_____
Person Notified Date Time

3.5.6 Check the following open:

- ☐ 1CA-2 (U1 CA Pumps Suct From CA Storage Tank Isol)
- ☐ 1CA-7AC (U1 TD CA Pump Suction Isol)

Manual Operation of #1 TD CA Pump

CAUTION: Starting the TD CA Pump will increase Rx Power due to increased steam flow. Reducing Turbine Generator load may be required to maintain power level. (R.M.)

NOTE:

- It is preferred to perform a normal start of the TD CA Pump.
- **IF** a slow start of the TD CA Pump is to be performed, Engineering should be available to provide guidance.

3.5.7 Start "#1 TD CA Pump" per Step 3.5.7.1 or 3.5.7.2: (NA step **NOT** performed)

_____ 3.5.7.1 **IF** normal start desired, perform the following:

_____ A. Place "#1 TD CA Pump" in "START".

B. Check the following open:

☐ 1SA-48ABC (1C S/G SM Supply to U1 TD CA Pump Turb Isol)

☐ 1SA-49AB (1B S/G SM Supply to U1 TD CA Pump Turb Isol)

☐ C. Check recirc valve opens by "FLOW" lit.

_____ D. **IF** operating CA Pump to cool piping, allow pump to run for at least 10 minutes. {PIP M-00-4158}

Manual Operation of #1 TD CA Pump

_____ 3.5.7.2 **IF** slow start desired, perform the following:

- _____ A. Using valve handwheel, ensure 1SA-3 (Unit 1 TD CA Pump
CV Turb Stop Valve) closed.

CAUTION: The following connections must be checked to prevent inadvertent trips from occurring and ensure the TD CA Pump will trip in an overspeed condition.
{PIP 05-5083}

- _____ B. Reconnect mechanical linkage by pulling mechanical linkage toward Valve Trip Mechanism and slowly release while ensuring the following connections:

- _____ 1. At Valve Trip Mechanism, Trip Hook is fully engaged
CV with Latch-up Lever. (See Figure 4.4-1)

- _____ 2. At Overspeed Trip Mechanism: (See Figure 4.4-2)

- _____ a. Tappet Nut lays flat against Overspeed Trip
CV Mechanism housing.

- _____ b. Head Lever is vertical.

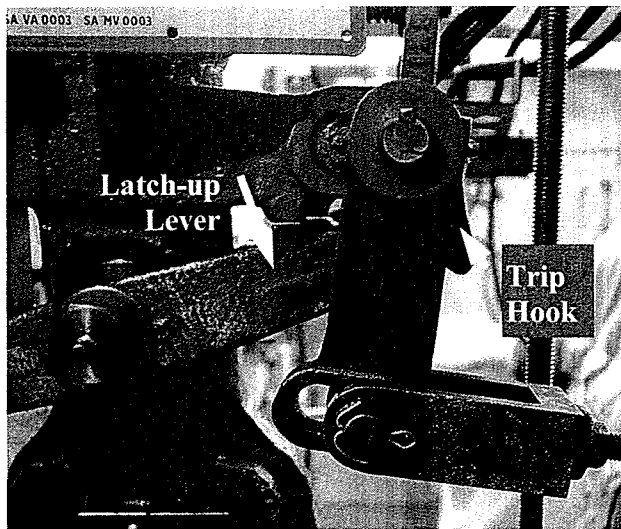


Figure 4.4-1. Mechanical Linkage End At Valve Trip Mechanism

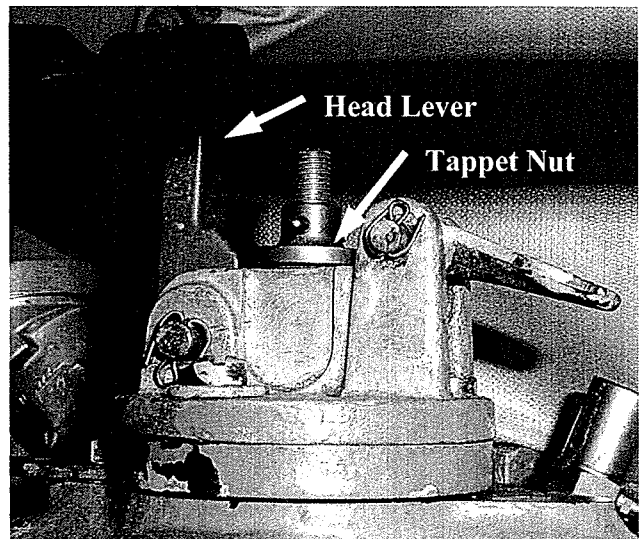


Figure 4.4-2. Mechanical Linkage End At Overspeed Trip Mechanism

Manual Operation of #1 TD CA Pump

Page 6 of 12

_____ C. Place "#1 TD CA Pump" to "Start".

D. Check the following open:

- ☐ 1SA-48ABC (1C S/G SM Supply To U1 TD CA Pump Turb Isol)
- ☐ 1SA-49AB (1B S/G SM Supply To U1 TD CA Pump Turb Isol)

<p>NOTE:</p> <ul style="list-style-type: none">• 1SA-3 handwheel will turn easily until pilot valve is fully opened and main disc begins to unseat. Handwheel becomes difficult to turn as main disc unseats and DP across valve equalizes, then handwheel once again turns easily.• TD CA Pump Turbine governor assumes turbine control at 3450 – 3550 rpm.
--

 E. Accelerate turbine by slowly opening 1SA-3 (Unit 1 TD CA
CV Pump Turb Stop Valve) as advised by Engineering.

 F. **AFTER** governor is controlling turbine speed, position
CV 1SA-3 (Unit 1 TD CA Pump Turb Stop Valve) to 1/4 turn
from open backseat to prevent thermal binding.

☐ G. Check recirc valve opens by "FLOW" lit.

_____ H. **IF** operating CA Pump to cool piping, allow pump to run for
at least 10 minutes. {PIP M-00-4158}

Unit 1

Manual Operation of #1 TD CA Pump

3.6 Stopping #1 TD CA Pump

_____ 3.6.1 **IF** stopping pump following EP/AP, check "TURB" depressed on the following:

- _____ • CA Modulating Valves Reset Train A
- _____ • CA Modulating Valves Reset Train B

_____ 3.6.2 **IF** operating #1 TD CA Pump locally, perform the following at "Turbine Driven CA Pump Control Panel":

_____ 3.6.2.1 Ensure "#1 TD CA Pump" in "LOCAL".

3.6.2.2 Ensure the following in "M-Local":

- CV _____ • 1CA-64 (TD CA Pump To S/G A)
- CV _____ • 1CA-52 (TD CA Pump To S/G B)
- CV _____ • 1CA-48 (TD CA Pump To S/G C)
- CV _____ • 1CA-36 (TD CA Pump To S/G D)

3.6.3 Ensure the following closed:

- CV _____ • 1CA-64AB (U1 TD CA Pump Disch to 1A S/G Control)
- CV _____ • 1CA-52AB (U1 TD CA Pump Disch to 1B S/G Control)
- CV _____ • 1CA-48AB (U1 TD CA Pump Disch to 1C S/G Control)
- CV _____ • 1CA-36AB (U1 TD CA Pump Disch to 1D S/G Control)

_____ 3.6.4 Ensure "RESET" lit on "TD CA Pump Auto Start Reset".

NOTE: #1 TD CA Pump should operate at least 10 minutes after pump start to minimize wear on CA Pump Turbine and associated piping. {PIP M-00-4158}

_____ 3.6.5 Place "#1 TD CA Pump" in "STOP".

3.6.6 Ensure the following closed:

- _____ • 1SA-48ABC (1C S/G SM Supply To U1 TD CA Pump Turb Isol)
- _____ • 1SA-49AB (1B S/G SM Supply To U1 TD CA Pump Turb Isol)

Manual Operation of #1 TD CA Pump

- _____ 3.6.7 **IF** operating #1 TD CA Pump for troubleshooting with CA **NOT** aligned for standby readiness, exit this procedure.
- 3.6.8 Ensure "TURB" released on the following:
- _____ • CA Modulating Valves Reset Train A
 - _____ • CA Modulating Valves Reset Train B
- ☐ 3.6.9 Monitor #1 TD CA Pump suction pressure.

NOTE: When opening valves 1CA-36, 48, 52, and 64 from the local panel, the controller needs to be opened 4 - 5 more turns once 100% is reached to minimize the amount that the valves drift close and back open upon returning controller back to control room (A-Remote).

- 3.6.10 Slowly open the following one at a time:
- CV _____ • 1CA-64AB (U1 TD CA Pump Disch to 1A S/G Control)
 - CV _____ • 1CA-52AB (U1 TD CA Pump Disch to 1B S/G Control)
 - CV _____ • 1CA-48AB (U1 TD CA Pump Disch to 1C S/G Control)
 - CV _____ • 1CA-36AB (U1 TD CA Pump Disch to 1D S/G Control)
- _____ 3.6.11 **IF** suction pressure increases indicating check valve leakage, perform the following:
- 3.6.11.1 Close the following:
- CV _____ • 1CA-64AB (U1 TD CA Pump Disch to 1A S/G Control)
 - CV _____ • 1CA-52AB (U1 TD CA Pump Disch to 1B S/G Control)
 - CV _____ • 1CA-48AB (U1 TD CA Pump Disch to 1C S/G Control)
 - CV _____ • 1CA-36AB (U1 TD CA Pump Disch to 1D S/G Control)
- _____ 3.6.11.2 Notify System Engineer for appropriate action.

_____/_____
Person Notified Date Time

Manual Operation of #1 TD CA Pump

3.6.12 Check the following temperatures stable:

- ☐ S/G A - M1A1439 (U1 CA Temp At Chk Vlv 1CA-65)
- ☐ S/G B - M1A1421 (U1 CA Temp At Chk Vlv 1CA-53)
- ☐ S/G C - M1A1294 (U1 CA Temp At Chk Vlv 1CA-49)
- ☐ S/G D - M1A1276 (U1 CA Temp At Chk Vlv 1CA-37)

_____ 3.6.13 **IF** increasing temperatures indicates check valve leak-by, notify System Engineer.

_____/_____
Person Notified Date Time

_____ 3.6.14 **IF AT ANY TIME** temperature approaches 280°F while aligned to CA Storage Tank, perform the following:

_____ 3.6.14.1 Declare #1 TD CA Pump inoperable.

SRO

3.6.14.2 Close control valve on the affected line(s):

- _____
CV • 1CA-64AB (U1 TD CA Pump Disch to 1A S/G Control)
- _____
CV • 1CA-52AB (U1 TD CA Pump Disch to 1B S/G Control)
- _____
CV • 1CA-48AB (U1 TD CA Pump Disch to 1C S/G Control)
- _____
CV • 1CA-36AB (U1 TD CA Pump Disch to 1D S/G Control)

☐ 3.6.14.3 Monitor temperature for 15 - 30 minutes.

_____ 3.6.14.4 **IF** temperatures remain high after 15 - 30 minutes, close isolation valve on affected line(s):

- _____
CV • 1CA-66AC (U1 TD CA Pump Disch to 1A S/G Isol)
- _____
CV • 1CA-54AC (U1 TD CA Pump Disch to 1B S/G Isol)
- _____
CV • 1CA-50B (U1 TD CA Pump Disch to 1C S/G Isol)
- _____
CV • 1CA-38B (U1 TD CA Pump Disch to 1D S/G Isol)

Manual Operation of #1 TD CA Pump

_____ 3.6.14.5 **IF** increasing temperatures indicates check valve leak-by, perform the following:

_____ A. Notify System Engineer.

Person Notified _____ / _____
Date Time

_____ B. Evaluate operating #1 TD CA Pump to cool CA System piping.
SRO

NOTE: When opening valves 1CA-36, 48, 52, and 64 from the local panel, the controller needs to be opened 4 - 5 more turns once 100% is reached to minimize the amount that the valves drift close and back open upon returning controller back to control room (A-Remote).

_____ 3.6.14.6 **AFTER** temperatures have returned to normal, ensure the following open:

- _____ CV _____ • 1CA-64AB (U1 TD CA Pump Disch to 1A S/G Control)
- _____ CV _____ • 1CA-52AB (U1 TD CA Pump Disch to 1B S/G Control)
- _____ CV _____ • 1CA-48AB (U1 TD CA Pump Disch to 1C S/G Control)
- _____ CV _____ • 1CA-36AB (U1 TD CA Pump Disch to 1D S/G Control)
- _____ CV _____ • 1CA-66AC (U1 TD CA Pump Disch to 1A S/G Isol)
- _____ CV _____ • 1CA-54AC (U1 TD CA Pump Disch to 1B S/G Isol)
- _____ CV _____ • 1CA-50B (U1 TD CA Pump Disch to 1C S/G Isol)
- _____ CV _____ • 1CA-38B (U1 TD CA Pump Disch to 1D S/G Isol)

3.6.14.7 Check the following stable:

- ☐ S/G A - M1A1439 (U1 CA Temp At Chk Vlv 1CA-65)
- ☐ S/G B - M1A1421 (U1 CA Temp At Chk Vlv 1CA-53)
- ☐ S/G C - M1A1294 (U1 CA Temp At Chk Vlv 1CA-49)
- ☐ S/G D - M1A1276 (U1 CA Temp At Chk Vlv 1CA-37)

_____ 3.6.14.8 Evaluate operability of CA System.
SRO

Unit 1

Manual Operation of #1 TD CA Pump

- _____ 3.6.15 Perform Enclosure 4.1 (Alignment for Standby Readiness).
- _____ 3.6.16 **WHEN** Standby Readiness alignment complete, perform the following:
- _____ 3.6.16.1 Notify CRS.
- _____ 3.6.16.2 Evaluate operability of CA System.
- SRO

End of Enclosure

In-Plant JPM J

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Manually Initiate Diesel Generator HalonJPM No.: 2011 Systems – In-Plant JPM J

K/A Reference: 086 A4.06 (3.2/3.2)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:Simulated Performance: X Actual Performance: Classroom Simulator Plant X **READ TO THE EXAMINEE**

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

- Initial Conditions:
- Control Power for the 1A D/G Halon Fire Protection System has been tagged out for Electrical Maintenance.
 - The Halon Bank transfer switch is selected to the "MAIN" position.
 - You have been assigned as Fire Watch.
 - A Fuel Oil fire starts in the 1A D/G room.

Task Standard: The operator will manually align Halon to the 1A D/G Room and manually-pneumatically discharge the system into the room.

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

General References: OP/0/A/6400/002B (Halon Fire Protection System), Rev 17

Handouts: Enclosure 4.3 (Local Manual Actuation of D/G Halon) of OP/0/A/6400/002B (Halon Fire Protection System).

Initiating Cue: Initiate a MANUAL PNEUMATIC actuation of the Halon Fire Suppression System to the 1A D/G Room, per OP/0/A/6400/002B (Halon Fire Protection System) Enclosure 4.3 (Local Manual Actuation of D/G Halon).

Job Performance Measure Worksheet

Time Critical Task: No

Validation Time: 5 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 4.3 of OP/0/A/6400/002B.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	(Step 3.3) Manual Pneumatic Operation (Step 3.3.1) Pull locking pin on pilot valve for desired D/G room (Located under the Fire Protection Control Panel): <ul style="list-style-type: none"> • 1MRFCV5040 (D/G Room A Halon Supply Control) • 1MRFCV5050 (D/G B Halon Supply Control) • 2MRFCV5040 (D/G Room A Halon Supply Control) • 2MRFCV5050 (D/G Room B Halon Supply Control) 	The operator locates the pilot valve locking pin for the 1A D/G Halon system (1MRFCV5040) and pulls it.		
		Cue: The pin is removed.		
*2	(Step 3.3.2) Open pilot valve. (This allows selector valve for the D/G room to open).	The operator rotates the handwheel counterclockwise.		
		Cue: Indicate that the handwheel rotates and then stops.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(Step 3.3.3) Remove seal and pull pin from selected Halon cylinder group.	The operator removes the seal wire and pull pin for the MAIN Halon Cylinder Group.		
		Cue: The Seal Wire and Pull Pin are removed.		
*4	(Step 3.3.4) Pull down manual lever at selected cylinder to actuate release of Halon.	The operator pulls the lever for the MAIN Halon Cylinder Group.		
		Cue: The lever is pulled down on the selected cylinder and Halon is being discharged into the 1A D/G room. The fire is out.		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 Systems – In-Plant JPM J

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM-CUE SHEET

INITIAL CONDITIONS:

- Control Power for the 1A D/G Halon Fire Protection System has been tagged out for Electrical Maintenance.
- The Halon Bank transfer switch is selected to the "MAIN" position.
- You have been assigned as Fire Watch.
- A Fuel Oil fire starts in the 1A D/G room.

INITIATING CUE:

Initiate a MANUAL PNEUMATIC actuation of the Halon Fire Suppression System to the 1A D/G Room, per OP/0/A/6400/002B (Halon Fire Protection System) Enclosure 4.3 (Local Manual Actuation of D/G Halon).

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

<div>Duke Energy McGuire Nuclear Station Halon Fire Protection System</div> <div>Continuous Use</div>	Procedure No. OP/0/A/6400/002 B
	Revision No. 017
	Electronic Reference No. MC0046Y8
<div>PERFORMANCE</div> <div>***** UNCONTROLLED FOR PRINT *****</div> <div>(ISSUED) - PDF Format</div>	

1. Limits and Precautions

- 1.1 **IF** a manual actuation of Halon is desired, dump the bank already selected for automatic release first. (This prevents draining both banks of Halon into the same room; one manually and one automatically). **IF** the selector switch is not visible from the Halon actuation point, discharge the "Main" bank first since it will normally be selected for automatic release.
- 1.2 Changes to Enclosure 4.3 (Local Manual Actuation of D/G Halon) will require new laminated sheets be placed at the local D/G Halon actuation stations.

2. Initial Conditions

- 2.1 Local manual actuation of D/G Halon required.

3. Procedure

- 3.1 Perform the following sections as applicable:
- ☐ Section 3.2, Manual Electric Operation
 - ☐ Section 3.3, Manual Pneumatic Operation
 - ☐ Section 3.4, Discharging into second D/G room after Halon already discharged into first D/G room
- 3.2 Manual Electric Operation
- 3.2.1 Depress and hold "MAIN" or "RESERVE" Actuation pushbutton at least **5 seconds** on the Fire Protection Control Panel to ensure complete Halon discharge (two Control Panels inside each room).
- 3.3 Manual Pneumatic Operation
- 3.3.1 Pull locking pin on pilot valve for desired D/G room (Located under the Fire Protection Control Panel):
- 1MRFCV5040 (D/G Room A Halon Supply Control)
 - 1MRFCV5050 (D/G Room B Halon Supply Control)
 - 2MRFCV5040 (D/G Room A Halon Supply Control)
 - 2MRFCV5050 (D/G Room B Halon Supply Control)
- 3.3.2 Open pilot valve. (This allows selector valve for the D/G room to open).
- 3.3.3 Remove seal and pull pin from selected Halon cylinder group.
- 3.3.4 Pull down manual lever at selected cylinder to actuate release of Halon.

- 3.4 Discharging into second D/G room after Halon already discharged into first D/G room
- _____ 3.4.1 **AFTER** first discharge is complete, depress "ABORT" pushbutton on one out of two Fire Protection Control Panels in the room of the first discharge.
- _____ 3.4.2 **IF** manually opened to make the first discharge, close the pilot valve for the first room (located under the Fire Protection Control Panel in the room of the first discharge).
- ☐ 3.4.3 Allow at least **15 seconds** between completion of the first release and discharging into the second room. (This ensures the pilot valve resets in the first room).
- _____ 3.4.4 Discharge the second bank of Halon into the second room using "Manual Pneumatic Operation" per Section 3.3 of this enclosure.

End of Enclosure

In-Plant JPM K

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Establish NC Pump Seal Injection from the SSFJPM No.: 2011 Systems – In-Plant JPM K

K/A Reference: EPE 055 EK3.02 4.3/4.6

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:Simulated Performance: X Actual Performance: Classroom Simulator Plant X **READ TO THE EXAMINEE**

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

Initial Conditions:

- A Loss of All AC has occurred on Unit 1.
- EP/1/A/5000/ECA-0.0 (Loss of All AC Power) has been implemented.
- The CRS has dispatched one (1) operator to 1ETA to swap 1EMXA4.

Task Standard:

SSF Diesel in operation and supplying power to 1SLXG. 1SLXG is supplying power to SMXG and SMXG-1. Battery Chargers SDSP-1 and SDSP-2 supply breakers are closed. Standby makeup pump is supplying NCP seal injection within 8 minutes. All critical tasks evaluated as satisfactory.

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

General References: EP/1/A/5000/ECA-0.0 (Loss of All AC Power), Rev 28

Handouts:

Enclosure 1 (Unit 1 SSF-ECA-0.0 Actions) of EP/1/A/5000/ECA-0.0 (Loss of All AC Power)

Job Performance Measure Worksheet

Initiating Cue: The CRS directs you to obtain the Brown Folder at SSF and complete Enclosure 1 (Unit 1 SSF-ECA-0.0 Actions).

Time Critical Task: YES (Re-establishing Seal Water flow of 26 gpm in accordance with Step 5.e of Enclosure must be completed within 8 minutes as indicated by PT/0/A/4600/113, (Operator Time Critical Task Verification), Enclosure 13.11, (Initiate SSF NCP Seal Injection and Swap to the SSF).)

This JPM should be timed starting from the OPS Kitchen. Once flow from the standby makeup pump is verified, the "critical time" stops.

Validation Time: 15 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and after the enclosure is located at the SSF Handout EP/1/A/5000/ECA-0.0, Enclosure 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 1) At SSF D/G Control Panel: (Step 1.a) Check "LINE VOLTS" – APPROXIMATELY 600V.	Operator checks line voltage.		
		Cue: Meter reads "0" Volts.		
2	(Step 1.a RNO) <u>GO TO</u> Step 1.c.	Operator goes to Step 1.c.		
*3	(Step 1.c) Place "SSF DIESEL TEST/EMERG" switch to "EMER"	Operator rotates "SSF DIESEL TEST/EMERG" switch clockwise to "EMER"		
		Cue: Switch rotated clockwise to EMER position.		
4	(Step 1.d) Check "SSF DIESEL START CONTROL" switch - "OFF"	Operator checks "SSF DIESEL START CONTROL" switch in OFF.		
		Cue: Switch is in "OFF" position.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	(Step 1.e) Place "SSF DIESEL START CONTROL" switch to "ON"	Operator places "SSF DIESEL START CONTROL" switch to ON.		
		Cue: Switch is rotated clockwise to "ON" position.		
6	(Step 1.f) Check D/G starts within 30 seconds	Operator observes Diesel condition.		
		Cue: Background noise level has increased, various gauge indications are up.		
*7	(Step 1.g) Depress "TRIP" for "NORMAL INCOMING BREAKER CONTROL"	Operator presses "TRIP" for "NORMAL INCOMING BREAKER CONTROL."		
		Cue: Pushbutton depressed, green lamp is illuminated.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*8	(Step 2) At 1SLXG: (Step 2.a) Open all 600 V load center breakers:	<p>Operator proceeds to Load Center 1SLXG and opens any breakers that are closed.</p> <p>Note: The BMXA feeder breaker is normally open and is not a critical step.</p> <ul style="list-style-type: none"> • 600V MCC BMXA NORMAL INCOMING FEEDER • 600V MCC SMXG • 600V MCC SMXG-1 • MOTOR CONTROL CENTER 1EMXH-1 ALTERNATE FEEDER • SSF STDBY BATTERY CHARGER SDSS <p>Cue (As Applicable):</p> <p>Switches rotated counterclockwise or trip pushbuttons depressed, green lamps are illuminated.</p>		
*9	(Step 3) At SMXG1: (Step 3.a) Open the following breakers: SMXG1-FAE (SDSP1 Battery Charger) SMXG1-RAD (SDSP2 Battery Charger)	<p>Operator proceeds to Load Center 1SMXG-1 and opens breakers.</p> <p>Cue (As Applicable):</p> <p>Breaker handle moved down.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	(NOTE prior to Step 4) Yellow "TIME CRITICAL" tags are located next to switches used in Steps 4 through 5.d.	The operator reads the Note and proceeds.		
*11	(Step 4) At 1SLXG: (Step 4.a) Depress "CLOSE" on 600 V load center breaker 1SLXG-5B (SSF D/G) (on breaker)	Operator proceeds to Load Center 1SMXG-1 and opens breakers.		
		Cue (As Applicable): Pushbutton depressed and breaker indicates closed.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
12	(Step 4.b) Using pistol grip switches, close the following breakers	Operator proceeds to Load Center 1SLXG-5C and closes breaker.		
		Cue: Pistol grip rotated clockwise, red light is illuminated.		
	* (Step 4.b.1) Close "1SLXG-5C CS" (SMXG1 MCC (Normal) Feeder Cntrl Switch).	Operator waits 10 seconds.		
		Operator proceeds to Load Center 1SLXG-4C and closes breaker.		
		Cue: Pistol grip rotated clockwise, red light is illuminated.		
	(Step 4.b.2) Wait 10 Seconds			
	* (Step 4.b.3) Close "1SLXG-4C CS" (SMXG MCC (Normal) Feeder Cntrl Switch).			

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*13	(Step 5) At SSF Control Panel: (Step 5.a) Open the following valves: Open 1NV-842AC (Standby M/U Pump Suction Isol) Open 1NV-849AC (Standby M/U Pump Cont Outside Isol)	Operator opens valves by depressing OPEN pushbutton, observes Red status light LIT.		
		Cue: Pushbutton depressed, red light is illuminated.		
14	(Step 5.b) Check 1NV-1013C (Standby M/U Pump to NC Pump Seals Isol) – OPEN	Operator observes Red status light LIT.		
		Cue: Red light is illuminated.		
*15	(Step 5.c) <u>Close</u> 1NV-94AC (NC Pumps Seal Ret Cont Inside Isol)	Operator closes valve by depressing CLOSED pushbutton, observes Green status light LIT.		
		Cue: Pushbutton depressed, Green light is illuminated.		
*16	(Step 5.d) Start Unit 1 Standby Makeup Pump.	Operator starts pump by depressing START pushbutton, observes Red status light LIT.		
		Cue: Pushbutton depressed, Red light is illuminated.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
17	(Step 5.e) Check Unit 1 Standby Makeup Pump flow (1NVP6420) - GREATER THAN OR EQUAL TO 26 GPM.	Operator observes meter		
		Cue: Meter indicates 28 gpm.		
		Stop Time for Time Critical Task: _____		
18	(NOTE prior to Step 5.f) Remaining steps in this procedure are not time critical, but must be completed in a timely manner.	The operator reads the Note and proceeds.		
19	(Step 5.f) Check 1NV-1012C (Standby M/U Pump to Cont Sump) - CLOSED	Operator observes Green status light LIT.		
		Cue: Green light is illuminated.		
20	(Step 5.g) Check SSF D/G - RUNNING	Operator observes Diesel condition.		
		Cue: Background noise level is heard, various gage indications are up.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
21	(Step 5.h) Check SSF D/G "FREQUENCY" - AT 60 Hz.	Operator observes meter.		
		Cue: Meter indicates 60 Hz.		
22	(Step 5.i) Check SSF D/G "VOLTAGE" – AT 600V.	Operator observes meter.		
		Cue: Meter indicates 600 Volts.		
23	(Step 6) At SMXG1:	Operator proceeds to Load Center SMXG1-FAE and closes breaker.		
	* (Step 6.a) Close SMXG1 - FAE (SDSP1 BATTERY CHARGER)	Cue: Breaker handle pulled into the UP position.		
	(Step 6.b) Wait 10 Seconds	Operator waits 10 seconds.		
	* (Step 6.c) Close SMXG1 - RAD (SDSP2 BATTERY CHARGER)	Operator proceeds to Load Center SMXG1-RAD and closes breaker.		
		Cue: Breaker handle pulled into the UP position.		
	(Step 6.d) Wait 10 Seconds	Operator waits 10 seconds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
24	(Step 7) At 1SLXG: (Step 7.a) Using pistol grip switch, close "1SLXG-5D CS" (SDSS Battery Charger Cntrl Switch). (Step 7.b) Wait 10 Seconds	Operator proceeds to Load Center SLXG-5D and closes breaker.		
		Cue: Pistol grip rotated clockwise, red light is illuminated.		
		Operator waits 10 seconds.		
25	(Step 8) At SMXG: (Step 8.a) Ensure SMXG-F5A (Unit 1 Pzr Heaters 28/55/56 Feeder) is closed.	Operator observes breaker position.		
		Cue: Breaker is closed.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
26	(Step 9) At SSF Control Panel: (Step 9.a) Check SSF D/G "FREQUENCY" - AT 60 Hz (Step 9.b) Check SSF D/G "VOLTAGE" – AT 600V. (Step 9.c) Check SSF Generator Load - LESS THAN OR EQUAL TO 700 KW	Operator observes SSF D/G Frequency Meter.		
		Cue: Meter indicates 60 Hz.		
		Operator observes SSF D/G Voltage Meter.		
		Cue: Meter indicates 600 volts.		
		Operator observes SSF Generator Load Meter.		
		Cue: Meter indicates 500 KW.		
27	(Step 10) Ensure SSF D/G room intake louvers are open (located above rollup doors in D/G room).	Operator observes SSF D/G room intake louvers position.		
		Cue: Intake louvers are open.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
28	<p>(NOTES prior to Step 11) Inability to start D/G or a D/G trip without apparent cause may indicate an electrical failure of the Fuel Oil Solenoid Valve.</p> <p>Opening the "FUEL OIL SOLENOID BYPASS" valve bypasses all trips (including manual).</p>	The operator reads the Notes and proceeds.		
29	<p>(Step 11) <u>IF AT ANY TIME</u> SSF D/G trips without apparent cause, <u>OR</u> is unable to be started without apparent cause, <u>THEN</u>:</p> <p>(Step 11.a) Ensure "GENERATOR BREAKER CONTROL" indicates "OPEN"</p> <p>(Step 11.b) Ensure the "SSF DIESEL START CONTROL" switch is in "OFF"</p> <p>(Step 11.c) Turn the manual knob on the "FUEL OIL SOLENOID BYPASS" (located on the SSF control room side of D/G, 3 ft from floor) fully clockwise</p> <p>(Step 11.d) RETURN TO Step 1.e.</p>	<p>Operator observes Diesel condition.</p> <p>Cue:</p> <p>Background noise level is heard, various gage indications are up.</p> <p>Operator proceeds to Step 12.</p>		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

TIME CRITICAL Total Time

_____ minutes

JPM CUE SHEET

INITIAL CONDITIONS:

- A Loss of All AC has occurred on Unit 1.
- EP/1/A/5000/ECA-0.0 (Loss of All AC Power) has been implemented.
- The CRS has dispatched one (1) operator to 1ETA to swap 1EMXA4.

INITIATING CUE:

The CRS directs you to obtain the Brown Folder at SSF and complete Enclosure 1 (Unit 1 SSF-ECA-0.0 Actions)

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

This is a Time Critical JPM.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

1. At SSF D/G Control Panel:

- ☐ a. Check "LINE VOLTAGE" - APPROXIMATELY 600V.
- ☐ b. GO TO Step 5.
- ☐ c. Place "SSF DIESEL TEST/EMERGENCY" switch to "EMER".
- ☐ d. Check "SSF DIESEL START CONTROL" switch - "OFF".

☐ a. GO TO Step 1.c.

d. At SSF D/G Control Panel:

1) IF "GENERATOR BREAKER CONTROL" switch is closed, THEN perform the following:

☐ a) Ensure "1SLXG-6A TO BMXA" (on control panel) is open.

☐ b) GO TO Step 5.

☐ 2) Depress "ALARM RELAY RESET" pushbutton (on control panel, upper right corner of relay board).

3) IF SSF D/G running, THEN perform the following:

☐ a) Adjust "SSF DIESEL GOVERNOR CONTROL" until frequency is 60 Hz.

☐ b) GO TO Step 1.g.

☐ 4) IF SSF D/G not running, THEN GO TO RNO for Step 1.f.

☐ e. Place "SSF DIESEL START CONTROL" switch to "ON".

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

1. (Continued)

___ f. Check D/G - STARTS WITHIN 30 SECONDS.

f. Perform the following:

___ 1) Place the "SSF DIESEL START CONTROL" switch to "OFF".

___ 2) **IF** two D/G start attempts have been performed, **THEN** observe Notes prior to Step 11 and **GO TO** Step 11.

___ 3) Wait 20 seconds and **RETURN TO** Step 1.e.

___ g. Depress "TRIP" for "NORMAL INCOMING BREAKER CONTROL".

2. **At 1SLXG:**

___ a. Open all 600 V load center breakers.

3. **At SMXG1:**

a. Open the following breakers:

___ • SMXG1 - FAE (SDSP1 Battery Charger)

___ • SMXG1 - RAD (SDSP2 Battery Charger).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE Yellow "TIME CRITICAL" tags are located next to switches used in Steps 4 through 5.d.

4. At 1SLXG:

- ___ a. Depress "CLOSE" on 600 V load center breaker 1SLXG-5B (SSF D/G) (on breaker).
- b. Using pistol grip switches, close the following breakers:
 - ___ 1) Close "1SLXG-5C CS" (SMXG1 MCC (Normal) Feeder Cntrl Switch).
 - ___ 2) Wait 10 seconds.
 - ___ 3) Close "1SLXG-4C CS" (SMXG MCC (Normal) Feeder Cntrl Switch).

5. At SSF Control Panel:

- a. OPEN the following valves:
 - ___ • OPEN 1NV-842AC (U1 Standby Makeup Pump Suction Isol)
 - ___ • OPEN 1NV-849AC (U1 Standby Makeup Pump Cont Outside Isol).

- a. Perform the following:

- ___ 1) Call Control Room or operator in 1ETA room to ensure 1EMXA4 has been swapped to alternate power **PER** Enclosure 2 (Unit 1 EMXA4 - ECA-0.0 Actions).

NOTE Indicating lights on 1NV-842AC and 1NV-849AC switches will light when 1EMXA4 is swapped.

- ___ 2) **WHEN** 1EMXA4 is swapped, **THEN** OPEN valves in Step 5.a.
- ___ 3) Do not continue until valves are open.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. (Continued)

___ b. Check 1NV-1013C (Standby M/U Pump to NC Pmp Seals Isol) - OPEN.

___ b. OPEN valve.

___ c. CLOSE 1NV-94AC (NC Pumps Seal Ret Cont Inside Isol).

___ d. Start Unit 1 Standby Makeup pump.

___ e. Check Unit 1 Standby Makeup pump flow (1NVP6420) - GREATER THAN OR EQUAL TO 26 GPM.

___ e. Ensure valves in Step 5.a are OPEN.

NOTE Remaining steps in this enclosure are not time critical, but must be completed in a timely manner.

___ f. Check 1NV-1012C (Standby M/U Pump Disch to Cont Sump) - CLOSED.

f. Perform the following:

___ 1) Stop Unit 1 Standby Makeup pump.

___ 2) CLOSE 1NV-1012C (Standby M/U Pump Disch to Cont Sump).

___ 3) Do not continue until 1NV-1012C is closed.

___ 4) RETURN TO Step 5.d.

___ g. Check SSF D/G - RUNNING.

g. Perform the following:

___ 1) Ensure SMXG-F5A (Unit 1 Pressurizer Heaters 28/55/56 Feeder) is closed.

2) Notify OSM of the following:

___ • **IF AT ANY TIME** Unit 1 offsite power is lost to 1SLXG (powered from 6900 V switchgear 1TC), **THEN** Enclosure 1 (Unit 1 SSF - ECA-0.0 Actions) must be performed again.

___ 3) RETURN TO step in effect in body of this procedure.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. (Continued)

___ h. Check SSF D/G "FREQUENCY" - AT 60 HZ.

___ h. Adjust the "SSF DIESEL GOVERNOR CONTROL" to obtain 60 Hz.

___ i. Check SSF D/G "VOLTAGE" - AT 600V.

___ i. Adjust "SSF DIESEL VOLTAGE CONTROL" to obtain 600V.

6. **At SMXG1:**

___ a. Close SMXG1 - FAE (SDSP1 BATTERY CHARGER).

___ b. Wait 10 seconds.

___ c. Close SMXG1 - RAD (SDSP2 BATTERY CHARGER).

___ d. Wait 10 seconds.

7. **At 1SLXG:**

___ a. Using pistol grip switch, close "1SLXG-5D CS" (SDSS Battery Charger Cntrl Switch).

___ b. Wait 10 seconds.

8. **At SMXG:**

___ a. Ensure SMXG-F5A (Unit 1 Pressurizer Heaters 28/55/56 Feeder) is closed.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

9. At SSF Control Panel:

- | | |
|--|--|
| <p><input type="checkbox"/> a. Check SSF D/G "FREQUENCY" - AT 60 HZ.</p> <p><input type="checkbox"/> b. Check SSF D/G "VOLTAGE" - AT 600V.</p> <p><input type="checkbox"/> c. Check SSF Generator Load - LESS THAN OR EQUAL TO 700 KW.</p> | <p><input type="checkbox"/> a. Adjust the "SSF DIESEL GOVERNOR CONTROL" to obtain 60 Hz.</p> <p><input type="checkbox"/> b. Adjust "SSF DIESEL VOLTAGE CONTROL" to obtain 600V.</p> <p><input type="checkbox"/> c. Contact station management to evaluate reducing load.</p> |
|--|--|

- ☐ 10. **Ensure SSF D/G room intake louvers are open (located above rollup door in D/G room).**

NOTE

- Inability to start D/G or a D/G trip without apparent cause may indicate an electrical failure of the Fuel Oil Solenoid valve.
- Opening the "FUEL OIL SOLENOID BYPASS" valve bypasses all trips (including manual).

- 11. IF AT ANY TIME SSF D/G trips without apparent cause, OR is unable to be started without apparent cause, THEN perform the following:**

- ☐ a. Ensure "GENERATOR BREAKER CONTROL" indicates "OPEN".
- ☐ b. Ensure the "SSF DIESEL START CONTROL" switch is in "OFF".
- ☐ c. Turn the manual knob on the "FUEL OIL SOLENOID BYPASS" (located on the SSF control room side of D/G, 3 ft from floor) fully clockwise.
- ☐ d. **RETURN TO** Step 1.e.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

12. Periodically (once per hour) monitor running SSF D/G as follows:

a. Check the following parameters - IN NORMAL OPERATING RANGE:

___ a. IF any parameter is outside its normal range, THEN notify OSM.

___ • "ENGINE WATER TEMP OUT" - LESS THAN 195°F

___ • "ENGINE LUBE OIL TEMP OUT" - LESS THAN 220°F

___ • "ENGINE LUBE OIL PRESSURE" - GREATER THAN 60 PSIG.

___ b. Inspect D/G for any leaks.

NOTE Isolation of the jacket water heater loop will not affect the SSF D/G engine cooling loop.

c. IF AT ANY TIME a leak from the jacket water heater loop is detected, THEN perform the following:

1) CLOSE the following valves:

___ • 1AD-23 (SSF Diesel Left Bank Water Heater Outlet Isol)

___ • 1AD-24 (SSF Diesel Right Bank Water Heater Outlet Isol)

___ • 1AD-25 (SSF Diesel Water Heater Inlet Isol).

___ 2) Open breaker SMXG-R4A (SSF D/G Jacket Water Heater & Lube Oil Heater).

___ 3) Notify OSM that jacket water heater loop has been isolated and location of leak.