Simulator JPM a

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: NEW (OPS-JPM-337)

Task Title: Deborate the RCS using the Deborating Ion Exchangers

Task No: 004-052-01-0100 **System:** 004 Chem and Volume Control System

K/A Reference: 004 A2.30 / 3.5 **Safety Function**: 1 Reactivity Control

Time Critical Task: No **Alternate Path:** Yes

Validation Time: 15 minutes

Method of testing / Location:

Simulated Performance ___ Actual Performance _X_

Classroom ___ Simulator _X_ Plant ___

Task Standard:

- Line up and perform a 1000 gallon deboration using the Deboration Demineralizers
- When control rods unexpectantly withdraw, the operator will diagnose an unanticipated reactivity change and stop the deboration prior to a cross limit being initiated.

Required Materials:
DB-OP-06001, Section 3.5 beginning at step 3.5.13.
Have steps 3.5.1 through 3.5.12 properly marked as completed.

General References:
None

Notes:
The stand-by candidate should be allowed to review the procedures and prints prior to entering the simulator to allow the JPM to start ASAP.

Initial Conditions:
The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:
The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

SIMULATOR INSTRUCTIONS:

INITIAL CONDITION:

Mode 1

End of cycle scenario with a boron concentration of 85 ppm.

Per DB-OP-06101 Step 4.16.3, Place the Reactor Coolant Drain Tank Pumps in LOCKOUT (No tags are required)

IC420

ADDITIONAL SETUP/DEVIATION FROM INITIAL CONDITION:

Ensure Batch Controller is "stopped" and zeroed out after each JPM reset.

MALFUNCTIONS/FAILURE TO INSERT:

Insert a malfunction so that when the deboration begins, RCS boron concentration ramps from initial conditions (85 ppm) to approximately 110 ppm over 5 minutes.

Open schedule to allow “Delete Malfunction” to work

EXAMINER COPY

INITIAL CONDITIONS:

All plant systems are in a normal alignment.

Purification Demineralizer 2 is in service.

The deboration amount has been calculated and independently verified.

Chemistry does **NOT** require a sample.

INITIATING CUES:

The CSRO directs you to:

Deborate the RCS using the deborating demineralizer for an amount of 1000 gallons in accordance with section 3.5 of DB-OP-06001, BORON CONCENTRATION CONTROL beginning with step 3.5.13 for rod index control.

All steps have been completed and verified through step 3.5.12.

(Provide examinee a marked up copy of Section 3.5 of DB-OP-06001)

CANDIDATE COPY

INITIAL CONDITIONS:

All plant systems are in a normal alignment.

Purification Demineralizer 2 is in service.

The deboration amount has been calculated and independently verified.

Chemistry does **NOT** require a sample.

INITIATING CUES:

The CSRO directs you to:

Deborate the RCS using the deborating demineralizer for an amount of 1000 gallons in accordance with section 3.5 of DB-OP-06001, BORON CONCENTRATION CONTROL beginning with step 3.5.13 for rod index control.

All steps have been completed and verified through step 3.5.12.

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT critical unless denoted in the "Comments".

START TIME: _____

1. PERFORMANCE STEP: Set desired batch size of 1000 gallons (OP6001 Step 3.5.13)
   .....C.....

   STANDARD: Set batch size of 1000 gallons, observe 1000 gallons in lower display.

   COMMENT: The candidate should take the necessary sub steps to enter the desired batch size.

   CUE: **The batch size has been independently verified.**

   NOTE: Depressing BATCH SET, entering 1000, depressing ENTER, and depressing DISPLAY are the critical components for this step.

   _____
   SAT UNSAT

---

2. PERFORMANCE STEP: Reset the indicated total on the batch controller (Step 3.5.14)

   STANDARD: Reset batch controller, observes 0 on display.

   COMMENT: The candidate should take the necessary sub steps to zero out the controller

   CUE: **None**

   _____
   SAT UNSAT

---

3. PERFORMANCE STEP: Display FLOW RATE in upper display (Step 3.5.15)

   STANDARD: Change display to FLOW RATE, observes no flow.

   COMMENT: The candidate should take the necessary sub steps to change the display to flow rate.

   CUE: **None**

   _____
   SAT UNSAT

---

4. PERFORMANCE STEP: Notify the CSRO that deboration is about to begin (Step 3.5.16)

   STANDARD: Notify the Unit Supervisor (CSRO).

   CUE: **None**

   _____
   SAT UNSAT

---

5. PERFORMANCE STEP: Enable batch controller by pressing RUN (Step 3.5.17)
.....C.....

STANDARD: Presses RUN on batch controller.

CUE: **None**

SAT UNSAT

6. PERFORMANCE STEP: Observe caution: 3.5.18. MU40 AND WC3526 shall be open prior to positioning MU11 to the CLN WST position to prevent lifting the letdown relief. (prior to Step 3.5.20)

STANDARD: Observes the caution in the procedure. JPM Steps 7 and 8 must be completed prior to JPM Step 9.

CUE: **None**

SAT UNSAT

7. PERFORMANCE STEP: Open MU40 BATCH ISO (Step 3.5.18)
.....C.....

STANDARD: Depresses OPEN on HIS MU40 and observes RED light lit, Green light OFF.

CUE: **None**

SAT UNSAT

8. PERFORMANCE STEP: Open WC3526 BOOSTER SYSTEM BYPASS (Step 3.5.19)
.....C.....

STANDARD: Depresses OPEN on HIS3526 and observes RED light lit, Green light OFF.

CUE: **None**

SAT UNSAT

9. PERFORMANCE STEP: Place MU11, DIVERT VALVE in the CLN WST position (Step 3.5.20)
.....C.....

STANDARD: Takes MU11 switch to CLN WST position. Observes indication consistent with deboration.

CUE: **None**

SAT UNSAT

10. PERFORMANCE STEP: Closely monitor letdown pressure (Step 3.5.21)

STANDARD: Calls up computer point P719. Observes letdown pressure to avoid exceeding 150 psig (the relief setpoint)

CUE: **None**

SAT UNSAT

Alternate Path starts here.
After MU11 is positioned, RCS boron concentration will ramp from 85 ppm to 110 ppm. RCS temperature will begin to lower and neutron error will build in the positive direction, resulting in unanticipated control rod movement in the outward direction. Control rods may withdraw to the point where they are fully withdrawn, and eventually a cross-limit resulting in associated alarms.

11. PERFORMANCE STEP: Deboration shall be stopped immediately if control rod group position indication, neutron count rate, or other reactivity indications are behaving in an erratic or unexpected manner. (limits and precautions 2.1.4)
.....C.....

STANDARD: Observes and diagnoses unexpected changes in Neutron Error and control rod motion (outward). Stops Deboration by routing to step 3.5.22.

NOTE: Response to the change in boron concentration may take 1-2 minutes to take effect. JPM is considered failed if the deboration is not stopped prior to a cross limit being initiated.

CUE: **Acknowledge diagnosis of unexpected reactivity changes.**

State to the candidate, "what do you recommend?"

Acknowledge recommendation.

SAT UNSAT

12. PERFORMANCE STEP: Observes note and caution prior to 3.5.22. (Step 3.5.22)

    STANDARD: Observes the caution in the procedure.

    CAUTION 3.5.22: MU11 should automatically transfer to the MU tank position if the Batch Controller is stopped. This must be verified to prevent excessive pressurization of the letdown piping.

    CUE: **None**

SAT UNSAT

13. PERFORMANCE STEP: If during deboration, the process must be stopped, THEN… **.....C.....** (Steps 3.5.22. a, b, c)

    STANDARD: Performs the following:
    - Depresses STOP on Batch Controller.
    - Observes MU11 position to the MU TK position.
    - Observes MU40 go from OPEN to CLOSED, RED light off, GREEN light Lit.

    CUE: **None**

SAT UNSAT

14. PERFORMANCE STEP: Notify CSRO deboration process has been stopped. (Step 3.5.22.d)

    STANDARD: Reports to the CSRO that the deboration process has been stopped.

    Another operator will complete the task.

SAT UNSAT

TERMINATING CUES: This JPM is complete (Terminated by the examiner)

END TIME:_____

Simulator JPM b

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-245

Task Title: Manually actuate SFAS levels 1 and 2

Task No: 013-005-05-0100 **System:** 013 SFAS

K/A Reference: 013 A4.03 / 4.4 **Safety Function**: 2 RCS Inventory Control

Time Critical Task: No **Alternate Path:** No

Validation Time: 15 minutes

Method of testing / Location:

Simulated Performance ___ Actual Performance _X_

Classroom ___ Simulator _X_ Plant ___

Task Standard:
Manual Actuation of SFAS Level 1 and 2 equipment by depressing the TRIP pushbuttons on all Level 1 and 2 Output Modules in all four SFAS Channels.

This JPM is considered failed if the candidate inadvertently actuates any SFAS Level 3, 4, or 5 equipment.

Required Materials:
DB-OP-06405, Safety Features Actuation System Procedure, Section 5.2

General References:
None

Notes:
None

Initial Conditions:
The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:
The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

SIMULATOR INSTRUCTIONS:

INITIAL CONDITION:

Mode 3 Normal shutdown in progress

RCS temperature is ≈305 °F

RCS pressure is ≈640 psig

IC422

ADDITIONAL SETUP/DEVIATION FROM INITIAL CONDITION:

SFAS RCS low pressure trips blocked

SFAS Doors unlocked

MALFUNCTIONS/FAILURE TO INSERT:

None

EXAMINER COPY

INITIAL CONDITIONS:

The plant is in Mode 3

A plant shutdown and cooldown were in progress in preparation for a refueling outage

SFAS LO PRESS TRIP has been blocked IAW DB-OP-06903, Plant Cooldown

INITIATING CUES:

An RCS leak has developed

The Unit Supervisor directs you to manually actuate SFAS levels 1 and 2 in accordance with section 5.2 of DB-OP-06405, Safety Features Actuation System Procedure

The Shift Manager has given permission to manually actuate SFAS

(Provide the examinee a copy of section 5.2 of DB-OP-06405)

CANDIDATE COPY

INITIAL CONDITIONS:

The plant is in Mode 3

A plant shutdown and cooldown were in progress in preparation for a refueling outage

SFAS LO PRESS TRIP has been blocked IAW DB-OP-06903, Plant Cooldown

INITIATING CUES:

An RCS leak has developed

The Unit Supervisor directs you to manually actuate SFAS levels 1 and 2 in accordance with section 5.2 of DB-OP-06405, Safety Features Actuation System Procedure

The Shift Manager has given permission to manually actuate SFAS

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT required unless denoted in the "Comments".

START TIME: _____

1. PERFORMANCE STEP: Check the status of the RC PRESSURE LO BLOCK Bistables BLOCKED lights in at least two SFAS Channels (Step 5.2.4 a.)

   STANDARD: Check RC PRESSURE LO BLOCK Bistables BLOCKED lights are on in at least two SFAS Channels (BA 103, BA 203, BA 303, and BA 403)

   CUE: **Prior to signing out keys**, "**The SFAS doors have been unlocked by another operator."**

   _____
   SAT UNSAT

NOTES for JPM Steps 2-5:

1. JPM Steps 2-5 may be performed in any order
2. This JPM is considered failed if the candidate inadvertently actuates any SFAS Level 3, 4, or 5 equipment
3. IF the candidate inadvertently trips an output module, they may be allowed to reset it

2. PERFORMANCE STEP: Actuate SFAS levels 1 and 2 in **Channel 1** (Step 5.2.4 b.)
   C

   STANDARD: In SFAS cabinet 1, depress the TRIP pushbuttons on all Level 1 and 2 Output Modules

   CUE: **None**

   _____
   SAT UNSAT

3. PERFORMANCE STEP: Actuate SFAS levels 1 and 2 in **Channel 2** (Step 5.2.4 b.)
   C

   STANDARD: In SFAS cabinet 2, depress the TRIP pushbuttons on all Level 1 and 2 Output Modules

   CUE: **None**

   _____
   SAT UNSAT

4. PERFORMANCE STEP: Actuate SFAS levels 1 and 2 in **Channel 3** (Step 5.2.4 b.)
C

STANDARD: In SFAS cabinet 3, depress the TRIP pushbuttons on all Level 1 and 2 Output Modules

CUE: **None**

SAT UNSAT

5. PERFORMANCE STEP: Actuate SFAS levels 1 and 2 in **Channel 4** (Step 5.2.4 b.)
C

STANDARD: In SFAS cabinet 4, depress the TRIP pushbuttons on all Level 1 and 2 Output Modules

CUE: **None**

SAT UNSAT

6. PERFORMANCE STEP: Verify proper SFAS actuation

STANDARD: Verify all SFAS level 1 and 2 equipment actuated properly using table 2 of DB-OP-02000

CUE: **Another Reactor Operator is verifying proper SFAS levels 1 and 2 actuation**

SAT UNSAT

TERMINATING CUES: This JPM is complete. (Terminated by the evaluator)

END TIME

5.2 Manual Actuation of SFAS

INITIALS Prerequisites

_____ 5.2.1 Obtain the Shift Manager's permission to initiate a manual actuation of SFAS.

a. IF the Shift Manager
OR the Control Room SRO is NOT present,
THEN the Reactor Operator has the responsibility to manually actuate SFAS as deemed appropriate for plant conditions.

Prerequisites completed by _____ Date _____

NOTE 5.2.2

The remainder of this Subsection does not require signoffs.

Procedure

5.2.2 IF all components of SFAS Levels 1 through 4 are to be manually actuated,
THEN perform the following on the SAFETY FEATURES MANUAL ACTUATION section of SAFETY FEATURES ACTUATION PANEL C5717.

a. IF all components except CTMT SPRAY are to be manually actuated,
THEN depress the TRIP portion of HIS 2022A, SFAS CHANNEL 1 ACTUATE
AND the TRIP portion of HIS 2023A, SFAS CHANNEL 2 ACTUATE.

NOTE 5.2.2.b

CTMT Spray includes pump and valve actuation.

b. IF CTMT Spray is to be manually actuated,
THEN depress the TRIP portion of HIS 2020A, CTMT SPRAY PUMP 1 ACTUATE
AND the TRIP portion of HIS 2021A, CTMT SPRAY PUMP 2 ACTUATE.

5.2.3 IF all components of only SFAS Level 1 are to be manually actuated,
THEN depress the TEST pushbutton on the CTMT RADIATION HIGH TRIP Bistable in any two SFAS Channels (BA 101, BA 201, BA 301, BA 401).

5.2.4 IF all components of only SFAS Level 1 and 2 are to be manually actuated, THEN perform the following:

a. Check the status of the RC PRESSURE LO BLOCK Bistables BLOCKED lights in at least two SFAS Channels. (BA 103, BA 203, BA 303, BA 403).

b. IF at least two RC PRESSURE LO BLOCK Bistable BLOCKED lights are OFF,
THEN depress the TEST pushbutton on the RC PRESSURE LO TRIP Bistable in the two SFAS Channels (BA 104, BA 204, BA 304, BA 404).
OTHERWISE depress the TRIP pushbuttons on all Level 1 and 2 Output Modules in all four SFAS Channels.

5.2.5 IF all SFAS Level 1, 2 and 3 components are to be manually actuated, THEN depress the TEST pushbutton on the CTMT PRESSURE HI TRIP Bistable in any two SFAS Channels (BA 110, BA 210, BA 310, BA 410).

5.2.6 IF all SFAS Level 1, 2, 3 and 4 components are to be manually actuated, THEN perform Steps 5.2.2.a and 5.2.2.b.

5.2.7 IF the SFAS Level 5 permissive is to be manually actuated, THEN depress the TEST pushbutton on the BWST LEVEL LO TRIP Bistable in any two SFAS Channels (BA 112, BA 212, BA 312, BA 412).

5.2.8 Verify proper SFAS actuation,
REFER TO DB-OP-02000, RPS, SFAS, SFRCS Trip, or SG Tube Rupture.

Simulator JPM
c

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-275

Task Title: Boron equalization between Pressurizer (PZR) and the Reactor Coolant System

Task No: 010-018-01-0100 **System:** 010 PZR Pressure Control

K/A Reference: 010 A4.01 / 3.8 **Safety Function**: 3 Reactor Pressure Control

Time Critical Task: No **Alternate Path:** Yes

Validation Time: 10 minutes

Method of testing:

Simulated Performance ___ Actual Performance _X_

Classroom ___ Simulator _X_ Plant ___

Task Standard:

- Initiate boron equalization between Pressurizer and the Reactor Coolant System (Turn on Pressurizer Heaters and throttle open the Spray valve)
- Recognize spray valve failure and take required immediate action (Close the Spray Block Valve) prior to a Reactor Trip due to Low RCS Pressure.

Required Materials:
DB-OP-06003, Pressurizer Operating Procedure, 4.3 Spraying PZR for Boron Equalization

General References:
None

Notes:
The stand-by candidate should be allowed to review the procedures and prints prior to entering the simulator to allow the JPM to start ASAP.

Initial Conditions:
The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:
The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

SIMULATOR INSTRUCTIONS:

INITIAL CONDITION:

Mode 1 (RX Pwr ≥95%)

IC425

ADDITIONAL SETUP/DEVIATION FROM INITIAL CONDITION:

Raise RCS Pressure on Narrow Range to ~2160 psig from 2155 psig.

MALFUNCTIONS/FAILURE TO INSERT:

HV00E fails to 0.47; RC2, Pressurize Spray, will fail to ~40% on Event 1
H10I21GL==0; Event 1: when switch taken out of AUTO.

EXAMINER COPY

INITIAL CONDITIONS:

The plant is operating at 100% power.

Chemistry reports Pressurizer boron is 130 ppmB higher than the RCS boron

INITIATING CUES:

The Unit Supervisor directs you to equalize Boron between the Reactor Coolant System and the Pressurizer using Section 4.3 of DB-OP-06003, Pressurizer Operating Procedure, for 4 hours.

Maximize the spray flow rate to expedite equalization.

(Hand Candidate a copy of DB-OP06003 Section 4.3)

CANDIDATE COPY

INITIAL CONDITIONS:

The plant is operating at 100% power.

Chemistry reports Pressurizer boron is 130 ppmB higher than the RCS boron

INITIATING CUES:

The Unit Supervisor directs you to equalize Boron between the Reactor Coolant System and the Pressurizer using Section 4.3 of DB-OP-06003, Pressurizer Operating Procedure, for 4 hours.

Maximize the spray flow rate to expedite equalization.

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT assumed unless denoted in the Comments".

START TIME: _____

1. PERFORMANCE STEP: Review prerequisites of DB-OP-06003 Section 4.3

   STANDARD: Reviews prerequisites of DB-OP-06003 Section 4.3

   Note: Prerequisites are signed off

   CUE: (If Asked) Nuclear Engineering has determined rods will be within Reactor Operator Guidance for Rod Index

SAT UNSAT

2. PERFORMANCE STEP: Place desired Pressurizer (PZR) heater banks in ON (Step 4.3.3)

   C

   STANDARD: Rotate selected PZR heater switches clockwise to ON

   Note: The Standard is to place additional heater(s) in service. Candidate may not start with all heaters ON but may leave some OFF to provide additional confidence of pressure control. The number of heaters placed in service is not Critical for this JPM

   CUE: None

SAT UNSAT

3. PERFORMANCE STEP: Throttle open RC2, PZR Spray, when RCS pressure is between 2170 and 2200 psig (Step 4.3.4)

   C

   STANDARD: Rotate HISRC2-1 clockwise momentarily then return it to AUTO

   CUE: None

SAT UNSAT

Alternate Path starts here.
Operator must recognize the spray valve is failed to 40% and not responding and take appropriate actions to isolate.

4. PERFORMANCE STEP: Recognize RCS pressure is lowering

   STANDARD: Observe RCS pressure indication. May turn on more heaters.

   CUE: **None**

SAT UNSAT

5. PERFORMANCE STEP: Close RC 2, Pressurizer Spray Valve (DB-OP-02513 IA Step 3.2.1)

   STANDARD: Rotate RC2-1 counterclockwise and hold until CLOSE light comes ON

   NOTE: RC 2 will fail to close

   CUE: **None**

SAT UNSAT

6. PERFORMANCE STEP: Close RC 10, PZR Spray Block valve (DB-OP-02513 IA Step 3.2.1 RNO)

   C

   STANDARD: Depress HIS RC 10 CLOSE button

   NOTE: Candidate performs DB-OP-02513 Immediate actions to close RC2, Pzr Spray and then RC10 Pzr Spray Block valve

   The block valve must be closed prior to a reactor trip due to Low RCS Pressure.

   CUE: **None**

SAT UNSAT

TERMINATING CUES: This JPM is complete. (Terminated by the evaluator)

END TIME

4.3 Spraying PZR for Boron Equalization

Prerequisites

NOTE 4.3.1

- The PZR-RCS DIFFERENTIAL BORON CONCENTRATION should be maintained within a range of no more than +500/-100 ppm and preferably within ±100 ppm.
- When spraying the PZR for boron equalization, appropriate water or boric acid additions should be made to maintain CRG 7 at the RI specified in the "Reactor Operating Guidance For Full Power Operation" provided by Reactor Engineering.

RO 4.3.1 Check the difference between the RCS and Pressurizer boron concentration is greater than 100 ppmb,
OR spraying is desired.

NOTE 4.3.2

- Section 4.8, Spraying PZR for Boron Equalization Below Normal Operating Pressure, is the preferred method for boron equalization, to avoid challenges to safety valve seat leakage.

N/A 4.3.2 IF it is acceptable based on current plant conditions and needs, F
THEN establish an RCS pressure band below NOP,
AND GO TO Section 4.8, Spraying PZR for Boron Equalization Below Normal Operating Pressure.

Prerequisites completed by RO Date Today

WORKING COPY	
VERIFIED CURRENT	
Initial/Date	Initial/Date
RO/Today	

Procedure

NOTE 4.3.3

- A continuous flow of about 1.5 gpm through the spray line allows water to recirculate slowly and equalize the Boron concentration between the PZR and the reactor coolant system. During startup from a cold condition (especially after refueling or other activities) when the boric acid in the coolant is rapidly changed, the spray flow should be raised so that the rate of recirculation is greater.
- Any combination of heaters may be used to raise and maintain RCS pressure while spraying the Pressurizer. The more heaters used the greater the spray flow rate that may be maintained.
- The maximum rate for raising RCS pressure above NOP is 25 PSIG/HR (based on limiting the chance of irreversible safety valve seat leakage).

_____ 4.3.3 Place the desired banks of Pressurizer Heaters in ON, for an RCS pressure rise of $\leq$ 25 PSIG/HR.

_____ 4.3.4 WHEN RCS pressure is 2170 to 2200 PSIG,
THEN throttle RC2, PRZR SPRAY VALVE, by momentarily placing HISRC2-1 in OPEN,
AND then returning it to AUTO.

_____ 4.3.5 Stabilize RCS pressure by throttling RC2, PRZR SPRAY VALVE,
OR by energizing
OR deenergizing additional heaters.

_____ 4.3.6 IF fine adjustments are required to control RCS pressure,
THEN place PICRC2 SCR HEATER CONTROL in HAND,
AND adjust heater demand.

4.3.7 WHEN sufficient time has elapsed to equalize the boron concentration
OR when directed by the Shift Manager,
THEN perform the following:

_____ a. Place HISRC2-1 in CLOSE

_____ b. WHEN 5 seconds have elapsed after the closed light is ON,
THEN return HISRC2-1 to AUTO.

_____ c. Return the Pressurizer Heaters selected in Steps 4.3.3 and 4.3.6 to AUTO.

_____ 4.3.8 Request Chemistry sample and analyze the RCS and Pressurizer for boron concentration.

Subsection 4.3 completed by _____ Date _____

Simulator JPM d

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-187

Task Title: Establish flow to the RCS from HPI Pump 1 upon a Loss of Decay Heat

Task No: 005-012-04-0100 **System:** 005 Decay Heat Removal System

K/A Reference: 005 K1.13 (4.2) **Safety Function**: 004P Decay Heat Removal

Time Critical Task: No **Alternate Path:** Yes

Validation Time: 30 minutes

Method of testing:

Simulated Performance ___ Actual Performance _X_

Classroom ___ Simulator _X_ Plant ___

Task Standard:
- Align DH Train 1 for RCS Cooling
- Initiate flow to the RCS from HPI Pump 1 when DH Pump 1 fails to start

Required Materials:
DB-OP-02527 Attachment 1, Attachment 5, and Attachment 7

General References:
None

Notes:
None

Initial Conditions:
The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:
The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

SIMULATOR INSTRUCTIONS

INITIAL CONDITION:

RCS Drained to 80 inches, DH Loop 2 in Service

IC428

ADDITIONAL SETUP/DEVIATION FROM INITIAL CONDITION:

- SPDS Decay Heat Removal Screen is not working.
- Verify DH14B and DH13B are closed.
- Hang Yellow Caution Tags on HPI Pumps 1 & 2 control switches.
- Place Ops Info tags on DH 1517, DH 1518, DH 63, DH 64, DH 2733, and DH 2734 stating "breaker open per DB-OP-06012".
- Place OPEN placards on DH 1517 and DH 1518.
- Place CLOSED placards on DH 63, DH 64, DH 2733, and DH 2734.

Do not take Simulator to run until student is ready to begin JPM

MALFUNCTIONS/FAILURE TO INSERT:

Insert malfunction to fail Decay Heat Pump 2's breaker open **(IMF BDP2C)**.
Insert malfunction to fail Decay Heat Pump 1's breaker open **(IMF BDP1C)**.

EXAMINER COPY

INITIAL CONDITIONS:

The plant is in Mode 5.

RCS temperature is 108°F.

RCS level is approximately 81 inches on LI 10577A and B, RCS level indication.

SGs Upper Primary Manways are removed.

Time to boil is 30 minutes.

Decay Heat Train 1 is in standby.

No RCS boron dilution is in progress.

The SPDS Decay Heat Removal Screen is not functioning.

INITIATING CUES:

Decay Heat Pump 2 has tripped on overcurrent.

The Crew has entered DB-OP-02527, Section 4.1 Loss of Decay Heat Removal Pump(s).

CTMT has been evacuated.

CTMT closure has been established.

The Shift Manager directs you to start Decay Heat Pump 1 IAW DB-OP-02527, Attachment 1, Starting Decay Heat Pump 1.

You have permission to operate any locked valves required.

Desired decay heat flow is 1500 gpm.

(**Provide a copy of DB-OP-02527 Attachment 1)**

CANDIDATE COPY

INITIAL CONDITIONS:

The plant is in Mode 5.

RCS temperature is 108°F.

RCS level is approximately 81 inches on LI 10577A and B, RCS level indication.

SGs Upper Primary Manways are removed.

Time to boil is 30 minutes.

Decay Heat Train 1 is in standby.

No RCS boron dilution is in progress.

The SPDS Decay Heat Removal Screen is not functioning.

INITIATING CUES:

Decay Heat Pump 2 has tripped on overcurrent.

The Crew has entered DB-OP-02527, Section 4.1 Loss of Decay Heat Removal Pump(s).

CTMT has been evacuated.

CTMT closure has been established.

The Shift Manager directs you to start Decay Heat Pump 1 IAW DB-OP-02527, Attachment 1, Starting Decay Heat Pump 1.

You have permission to operate any locked valves required.

Desired decay heat flow is 1500 gpm.

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT assumed unless denoted in the "Comments".

START TIME: _____

NOTE: Do not take Simulator to run until student is ready to begin JPM.

1. PERFORMANCE STEP: Verify the correct procedure attachment.

   STANDARD: Identify Attachment 1, as the correct procedure attachment.

   CUE: **None**

   _____
   SAT UNSAT

2. PERFORMANCE STEP: Close DH 14B. (Attachment 1 Step 1.1)
   .....C.....

   STANDARD: Depress AUTO on HIS DH 14B
   Verify zero demand is indicated on HIC DH14B
   May also check Green light ON at HIS DH 14B

   CUE: **None**

   _____
   SAT UNSAT

3. PERFORMANCE STEP: Close DH 13B. (Attachment 1 Step 2.1)
   .....C.....

   STANDARD: Depress AUTO on HIS DH 13B
   Verify zero demand is indicated on HIC DH 13B
   May also check Green light is ON at HIS DH 13B

   COMMENT: Operator should GOTO Step 6.0 (per Attachment 1 Step 3.0)

   CUE: (**If asked)** ***No signs of cavitation were present.***

   (If necessary) ***Venting Decay Heat Pump 1 is NOT required.***

   _____
   SAT UNSAT

4. PERFORMANCE STEP: Verify open DH 1517. (Attachment 1 Step 6.1)

   STANDARD: Checks placard or INFO Tag on HIS 1517 to verify position.

   CUE: **None**

SAT UNSAT

5. PERFORMANCE STEP: Verify open DH 11 and DH 12.
   (Attachment 1 Step 6.2 first bullet)

   STANDARD: Visual verification of Red light on HIS DH11 and HIS DH12.

   COMMENT: DH 21 and DH 23 are locally operated manual valves in CTMT

   CUE: (**If asked)** ***DH 21 and DH 23 are not to be used per SM discretion.***

SAT UNSAT

6. PERFORMANCE STEP: Verify CCW and SW cooling is available, Open CC 1467
   .....C..... (Attachment 1 Step 6.3 and 6.4)

   STANDARD: Check CCW Pump 1 is running **(Not Critical)**
   Depress OPEN on HIS 1467, check RED light is LIT, GREEN is OFF
   Check SW Pump 1 is running **(Not Critical)**

   COMMENT: May also check SW36 open by placard and SW1424 position.

   CUE: (**If asked)** ***CC172, CCW From DH Cooler 1 Outlet has been throttled to maintain CCW flow within limit.***
   (If asked after CC 1467 is open) ***flow is at 7200 gpm***

SAT UNSAT

7. PERFORMANCE STEP: Verify open DH 1B, (Attachment 1 Step 6.6 second bullet)

   STANDARD: Visual verification of Red light is LIT on HIS DH1B.

   COMMENT: Step 6.5 is not applicable because DHP 1 will be aligned to DH Train 1

   NOTE: Student may read ahead prior to starting DHP 1, refer to curves CC6.2 and CC6.4

   CUE: **(If asked) Hand a copy of curves CC6.2 and CC6.4 to the candidate**
   (**If asked) Decay Heat Pump suction pressure is 13 psig.**

SAT UNSAT

Alternate Path starts here.
DH Pump 1 fails to start. Candidate should perform a crew update.

8. PERFORMANCE STEP: Start DH Pump 1 using HIS DH 6B. (Attachment 1 Step 6.7)

   STANDARD: Recognize DH Pump 1 does not start.

   CUE: **What is your recommendation?**

   The Shift Manager directs you to perform Attachment 5, Establish Feed and Bleed Cooling, start HPI Pump 1 and establish forced flow to the RCS.

   (Hand a copy of Attachment 5 to the candidate)

   SAT UNSAT

9. PERFORMANCE STEP: Continue efforts to establish SG Heat Transfer if possible. REFER TO Attachment 3, Establish SG Heat Transfer. (Attachment 5 Step 1.)

   STANDARD: N/A

   CUE: **Another operator will perform Attachment 3.**

   SAT UNSAT

10. PERFORMANCE STEP: Verify Containment is evacuated prior to establishing feed and bleed cooling. (Attachment 5 Step 2.)

    STANDARD: Sign step as complete based on initial cue

    CUE: **IF required, CTMT has been evacuated**

    SAT UNSAT

11. PERFORMANCE STEP: Select AND implement one OR more Inventory Injection Sources. (Attachment 5 Step 3. 2nd Bullet)

    STANDARD: Identify Attachment 7, Using High Pressure Injection System to Inject Water, as the correct procedure attachment.

    CUE: (**When identified) Hand Candidate a copy of Attachment 7.**

    SAT UNSAT

12. PERFORMANCE STEP: Complete Attachment 7 Step 1 based on earlier cue.

    STANDARD: Fill in the blank (High Pressure Injection Pump 1) and initial step 1 as complete

    CUE: **(If asked)**

    - **The Shift Manager has given permission to remove tags from AC111 breaker for HPI pump 1 and HIS1524.**
    - **The System Status File and Safety Tagging file for HPI show the system valve lineup is complete for Mode 3 entry.**
    - **The HPI system is being credited as an inventory source per NOP-OP-1005, Shutdown Defense in Depth**

    SAT UNSAT

13. PERFORMANCE STEP: Verify the HPI Pump Suction from the BWST is available by opening DH7B, BWST Outlet Line 1. (Attachment 7 Step 2.a.)
    .....C.....

    STANDARD: Communicate with an EO to remove tags from and close BE1157. OPEN DH7B, BWST Outlet Line 1.

    CUE: **(I/F) DH7B breaker, BE1157, is closed**

    SAT UNSAT

14. PERFORMANCE STEP: Verify HPI Pump 1 breaker (AC111) is racked in with close power fuses installed (Attachment 7 Step 2.b.)
    .....C.....

    STANDARD: Communicate with an EO to remove tags and rack in AC111.

    CUE: **(If asked) The Shift Manager has given permission to remove tags from AC111 breaker for HPI pump 1 and HIS1524.**

    (I/F) HPI 1 breaker, AC111, is RACKED IN and the close power fuses installed

    SAT UNSAT

15. PERFORMANCE STEP: Close High Pressure Injection valves HP 2C and 2D. (Attachment 7 Step 2.c.)

    STANDARD: Visual verification of Green light is LIT on HIS HP2C and HIS HP2D.

    CUE: **None**

SAT UNSAT

14. PERFORMANCE STEP: Start HPI Pump 1. (Attachment 5, Step 2.d)
    .....C.....

    STANDARD: Place HIS 1524 to START, then release. Observe the Red light goes ON and the Green light goes OFF.

    CUE: **None.**

SAT UNSAT

15. PERFORMANCE STEP: Throttle HP 2C, and 2D to establish injection flow.
    .....C..... (Attachment 7 Step 2.e)

    STANDARD: Press the open pushbutton on HP 2C and/or HP 2D using HIS HP2C and HIS HP2D until flow is established.

    COMMENT: Actual flow rate is not critical at this step, provided some flow is provided. Not required to open both valves.

    CUE: **None**

SAT UNSAT

TERMINATING CUES: This JPM is complete. (Terminated by the evaluator).

END TIME

ATTACHMENT 1: STARTING DECAY HEAT PUMP 1
Page 1 of 7

The purpose of this attachment is to provide direction to restore Decay Heat Removal using Decay Heat Removal Pump 1. The attachment provides direction to use DHR Pump 1 to supply either Train 1 or Train 2 injection lines.

1.0 Isolate DH pump 1 discharge as follows:

1.1 IF Instrument Air is available,
THEN Close DH14B, DH CLR 1 OUTLET as follows:

_____ a. Press AUTO for DH14B using HIS DH14B.

_____ b. Close DH14B using HIC DH14B.

1.2 IF Instrument Air is not available,
THEN Close DH1B, DH PUMP 1 DISCHARGE TO REACTOR COOLANT SYSTEM ISOLATION as follows:

_____ a. Place control power on by depressing HIS DH1B-2.

_____ b. Close DH1B using HIS DH1B.

2.0 Isolate DH CLR 1 BYPASS as follows

2.1 IF Instrument Air is available,
THEN Close DH13B DH CLR 1 BYPASS, as follows:

_____ a. Press AUTO for DH13B using HIS DH13B.

_____ b. Close DH13B using HIC DH13B.

_____ 2.2 IF Instrument Air is not available,
THEN Press close on HIS DH13B

_____ 3.0 IF there were no signs of pump cavitation on either DH Pump,

THEN GO TO Step 6.0

4.0 IF RCS Level is less than 48 inches,
OR RCS temperature is greater than 180°F
THEN vent the DH Pump 1 using the BWST as follows:

_____ 4.1 IF DH Pump 1, is being placed in service on LPI line 2,
AND RCS level is less than 48 inches,
THEN verify DH831, COOLER DISCH XOVER 1 TO 2, is closed.

_____ 4.2 Notify Command SRO to REFER TO TS 3.4.12, Low Temperature Overpressure Protection.

4.3 Restore Control Power AND close either

_____ DH11 using HIS DH11, RCS TO DH ISO,

OR

_____ DH12 using HIS DH12, RCS TO DH ISO.

_____ 4.4 IF DH21* RCS TO DH SYSTEM ISOLATION BYPASS, AND DH23*, RCS TO DH SYSTEM ISOLATION, are open, THEN close either DH21* OR DH23*.

_____ 4.5 Close Breaker BE1126 (E11D) for DH1517 (ROOM 227 AUX BLDG 565' CENTRAL PASSAGE).

_____ 4.6 Close Breaker BE1121 (E11A) for DH2733 (ROOM 209 CORRIDOR TO #1 Mechanical Penetration Room).

_____ 4.7 Verify BE1157 (E11A) for DH7B is closed (ROOM 209 CORRIDOR TO #1 Mechanical Penetration Room).

_____ 4.8 Close DH1517 using HIS 1517, DH PUMP 1 SUCTION.

_____ 4.9 Verify DH7B BWST OUTLET LINE 1, is open using HIS DH7B.

_____ 4.10 Open DH2733 using HIS 2733, DH PUMP 1 LPI SUCTION

_____ 4.11 Verify DH10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION, is open (#2 Mechanical Penetration Room).

4.12 Vent DH Pump 1 suction piping by performing the following:

_____ a. Throttle open DH173, DH PUMP 1 SUCTION FROM RCS VENT (#2 Mechanical Penetration Room), until water free of bubble is obtained.

_____ b. Throttle open DH180, DH PUMP 1 SUCTION FROM RCS VENT (#2 Mechanical Penetration Room), until water free of bubble is obtained.

* Controlled in accordance with DB-OP-00008, Operation and Control of Locked Valves

_____ 4.13 Verify DH10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION, is closed (#2 Mechanical Penetration Room).

_____ 4.14 Vent DH Pump 1 casing using DH57, DH PUMP 1 CASING VENT (#1 ECCS Pump Room).

_____ 4.15 Close DH2733 using HIS 2733, DH PUMP 1 LPI SUCTION.

_____ 4.16 Open DH1517 using HIS 1517, DH PUMP 1 SUCTION.

_____ 4.17 GO TO Step 6.0.

5.0 Vent the Decay Heat Pump 1 from the Reactor Coolant System as follows:

5.1 Verify either set of valves are open:

_____ • DH11 using HIS DH11, RCS TO DH ISO, AND DH12 using HIS DH12, RCS TO DH ISO

OR

_____ • DH21* RCS TO DH SYSTEM ISOLATION BYPASS AND DH23*, RCS TO DH SYSTEM ISOLATION.

_____ 5.2 Verify DH1517 is open using HIS 1517, DH PUMP 1 SUCTION OR an Operations Information tag providing valve position.

_____ 5.3 Vent DH Pump 1 suction piping using DH173, DH PUMP 1 SUCTION FROM RCS VENT (#2 Mechanical Penetration Room).

_____ 5.4 Vent DH Pump 1 casing using DH57, DH PUMP 1 CASING VENT (#1 ECCS Room).

* Controlled in accordance with DB-OP-00008, Operation and Control of Locked Valves

CAUTION 6.0

Do not attempt to start a Decay Heat Removal Pump with RCS level less than 80 inches until it is verified the loss of the running Decay Heat Pump was not due to air binding (fluctuating injection flow or motor amps) of the common suction line. The DH Pump will be damaged if allowed to run without adequate suction pressure.

6.0 To start Decay Heat Pump 1, perform the following:

_____ 6.1 Verify DH1517 DH PUMP 1 SUCTION, is open using HIS 1517 or an Operations Information Tag providing valve position.

6.2 Verify either set of DH Drop Line valves are open, as follows:

_____ • DH11 using HIS DH11, RCS TO DH ISO
AND DH12 using HIS DH12, RCS TO DH ISO

OR

_____ • DH21*, RCS TO DH SYSTEM ISOLATION BYPASS
AND DH23*, RCS TO DH SYSTEM ISOLATION.

_____ 6.3 Verify CCW cooling is available for Decay Heat Train 1:

- CCW Pump 1 or 3 as 1 operating
- CC1467 is open

_____ 6.4 Verify SW cooling is available for the CCW Train cooling DHR Train 1.

_____ 6.5 IF DH Pump 1, is being placed in service on DH/LPI Injection line 2, THEN GO TO Step 7.0.

* Controlled in accordance with DB-OP-00008, Operation and Control of Locked Valves

6.6 Prepare to control DH 1 pump flow as follows:

_____ • IF Instrument Air is available,
AND RCS level is less than 80” due to controlled draining,
THEN Verify DH1B, DH PUMP 1 to RCS ISO, is set IAW DB-OP-06904 to limit DH flow for RCS Level less than 80 inches.

_____ • IF Instrument Air is available,
AND RCS level is greater than 80”,
THEN Verify DH1B, DH PUMP 1 to RCS ISO is open using HIS DH1B

_____ • IF instrument Air is NOT available,
OR leakage has caused RCS level to lower less than 80”,
THEN verify DH1B, DH PUMP 1 to RCS ISO is closed using HIS DH1B.

_____ 6.7 Start Decay Heat Pump 1 using HIS DH6B, LPI/DH PUMP 1.

6.8 While monitoring for cavitation and cooldown rate, establish Decay Heat flow at a value less than the value where vortexing can occur by performing the following:

_____ a. IF Instrument Air is available,
THEN slowly open DH14B, DH CLR 1 OUTLET,
AND DH13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE. REFER TO CC 6.2 and CC 6.4 in DB-PF-06703, Miscellaneous Operation Curves.

_____ b. IF instrument Air is NOT available,
OR leakage caused RCS level to lower less than 80”,
THEN slowly open DH1B, DH PUMP 1 to RCS ISO using HIS DH1B. REFER TO CC 6.2 and CC 6.4 in DB-PF-06703, Miscellaneous Operation Curves.

_____ c. After the desired flow has been set,
THEN remove control power from DH1B by depressing off on HIS DH1B-2.

6.9 IF DH Pump was vented using the BWST,
THEN restore Decay Heat Suction breakers as follows:

_____ • Open Breaker BE1126 (E11D) for DH1517.

_____ • Open Breaker BE1121 (E11A) for DH2733.

_____ • Open Breaker BE1157 (E11A) for DH7B.

ATTACHMENT 1: STARTING DECAY HEAT PUMP 1

7.0 IF DH Pump 1 is being placed in service on LPI Injection line 2, THEN perform the following:

_____ 7.1 Close DH54*, DH PUMP 2 RECIRC LINE STOP VALVE (#2 ECCS Room).

_____ 7.2 Verify DH831, COOLER DISCH XOVER 1 TO 2, is open.

_____ 7.3 IF instrument air is available, THEN prepare to control DH 1 pump flow as follows:

_____ a. Verify DHIA*, DH PUMP 2 TO RCS ISO is open using HISDH1A

_____ b. Verify DHIB*, DH PUMP 1 DISCHARGE TO REACTOR COOLANT SYSTEM ISOLATION is closed.

_____ c. Verify DH14A, DH COOLER 2 OUTLET FLOW CONTROL VALVE, is closed, using HIC DH14A.

_____ d. Verify DH13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, is closed, using HIC DH13A.

_____ 7.4 IF instrument air is not available, THEN prepare to control DH 1 pump flow as follows:

_____ a. Verify DH1A, DH PUMP 2 TO RCS ISO is closed using HIS DH1A.

_____ b. Verify DH1B, DH PUMP 1 DISCHARGE TO REACTOR COOLANT SYSTEM ISOLATION is closed, using HIS DH1B.

_____ c. Verify DH13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, is closed by depressing close on HIS DH13A.

_____ d. Verify DH13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, is closed by depressing close on HIS DH13B.

_____ e. Verify DH14A, DH COOLER 2 OUTLET FLOW CONTROL VALVE, is open, by depressing open on HIS DH14A.

* Controlled in accordance with DB-OP-00008, Operation and Control of Locked Valves

_____ 7.5 Start DH Pump 1 using HIS DH6B.

_____ 7.6 While monitoring for cavitation and cooldown rate, establish Decay Heat flow at a value less than the value where vortexing can occur by performing the following:

_____ a. IF instrument Air is available,
THEN throttle open DH14A, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH14A, to obtain the desired flow. REFER TO CC 6.2 and CC 6.4 in DB-PF-06703, Miscellaneous Operation Curves.

_____ b. IF instrument Air is not available,
THEN slowly throttle open DH1A, DH PUMP 2 TO RCS ISO using HIS DH1A to obtain the desired flow. REFER TO CC 6.2 and CC 6.4 in DB-PF-06703, Miscellaneous Operation Curves.

_____ c. After the desired flow has been set,
THEN remove control power from DH1A by depressing off on HISDH1A-2.

7.7 IF DH Pump was vented using the BWST,
THEN restore Decay Heat Suction Breakers as follows:

_____ • Open Breaker BE1126 (E11D) for DH1517.

_____ • Open Breaker BE1121 (E11A) for DH2733.

_____ • Open Breaker BE1157 (E11A) for DH7B.

_____ 8.0 IF DH Pump 1 was vented,
THEN notify Radiological Protection that DH Pump 1 was vented.

ATTACHMENT 5: ESTABLISH FEED AND BLEED COOLING

Purpose: This attachment provides direction to establish core decay heat removal using Feed and Bleed Cooling when AC power is available. In this method, inventory is added to the Reactor Coolant System from an injection (feed) source and removed from the Reactor Coolant System via a vent or opening (bleed) path. This method includes filling the Refueling Canal to maximize heat sink available.

This Attachment is **Command SRO Directed**.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
___ 1. Continue efforts to establish SG Heat Transfer if possible. REFER TO Attachment 3, Establish SG Heat Transfer.	
___ 2. Verify Containment is evacuated prior to establishing feed and bleed cooling.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3. Select AND implement one OR more Inventory Injection Sources. ___ • Low Pressure Injection. REFER TO Attachment 6, USING LPI PUMP TO INJECT WATER. ___ • High Pressure Injection. REFER TO Attachment 7, USING HPI PUMP TO INJECT WATER. ___ • Makeup Pumps. REFER TO Attachment 8, USING MU PUMP TO INJECT WATER. ___ • Clean Waste Receiver Tank Pumps. REFER TO Attachment 9, USING THE CWRT TRANSFER PUMPS TO INJECT WATER. ___ • Use Gravity Drain of the BWST to add inventory to the Reactor Coolant System. REFER TO ATTACHMENT 10, USING GRAVITY DRAIN OF BWST TO THE RCS.	___ Use an Alternate Method for providing Injection. REFER TO Attachment 11, Alternate Methods of Injection.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4. IF the RCS pressure boundary is intact, THEN establish a Bleed flowpath as follows: ___ 1. Open the PORV, RC2A 2. Open the PORV BLOCK, RC11. 3. Open the RCS Loop High Point Vents ___ • RC4608A ___ • RC4608B ___ • RC4610A ___ • RC4610B 4. Open Pressurizer Sample path ___ • RC239A ___ • RC239B ___ • RC200A	___ IF the RCS pressure boundary is intact, THEN allowing RCS Pressure to rise as RCS temperature rises will lift DHR Drop Line Relief Valve DH4849 providing an RCS vent path.
___ 5. Monitor Incore Thermocouples as an indication of the effectiveness of the Injection and vent flow paths.	___ Seek additional injection sources and/or vent paths to provide adequate core cooling.
___ 6. Evaluate methods to extend injection inventory such as: • Add inventory to the BWST • Use Containment Spray to move inventory from Containment Emergency Sump back to the BWST. REFER TO Injection Attachment(s) from this procedure that are being used to inject inventory.	

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ATTACHMENT 7: USING HIGH PRESSURE INJECTION SYSTEM TO INJECT WATER

Purpose: The purpose of this attachment is to establish flow from the BWST using either HPI flowpath to inject water into the RCS. The attachment provides direction assuming the HPI system is being credited as an inventory source per NOP-OP-1005, Shutdown Defense in Depth and therefore only provides only the direction necessary to align major components assuming no intrusive maintenance is in progress.

_____ 1. Request Command SRO to determine which High Pressure Injection Pump will be aligned to inject water from the BWST to the Reactor Coolant System.

High Pressure Injection Pump _____

High Pressure Injection Pump 1

2. IF High Pressure Injection Pump 1 will be aligned to inject water, THEN perform the following:

_____ a. Verify the HPI Pump Suction from the BWST is available by opening DH7B, BWST OUTLET LINE 1.

_____ b. IF forced flow from HPI is required, THEN verify HPI Pump 1 breaker (AC111) is racked in with close power fuses installed. (**N/A** during an ELAP)

c. Close HPI Train 1 discharge valves:

_____ • HP2C, HPI LINE 1-1 ISOLATION VALVE

_____ • HP2D, HPI LINE 1-2 ISOLATION VALVE

_____ d. IF forced flow from the HPI pump is required, THEN start HPI Pump 1. (**N/A** during an ELAP)

e. Throttle open HPI discharge valves as necessary to establish flow:

_____ • HP2C, HPI LINE 1-1 ISOLATION VALVE

_____ • HP2D, HPI LINE 1-2 ISOLATION VALVE

_____ f. GO TO Step 4, Control Injection Flow.

High Pressure Injection Pump 2

3. IF High Pressure Injection Pump 2 will be aligned to inject water, THEN perform the following:

_____ a. Verify the HPI Pump Suction from the BWST is available by opening DH7A, BWST OUTLET LINE 2.

_____ b. IF forced flow from HPI is required, THEN verify HPI Pump 2 breaker (AD111) is racked in with close power fuses installed. (**N/A** during an ELAP)

c. Close HPI Train 2 discharge valves:

_____ • HP2A, HPI LINE 2-1 ISOLATION VALVE

_____ • HP2B, HPI LINE 2-2 ISOLATION VALVE

_____ d. IF forced flow from the HPI pump is required, THEN start HPI Pump 2. (**N/A** during an ELAP)

e. Throttle open HPI discharge valves as necessary to established flow:

_____ • HP2A, HPI LINE 2-1 ISOLATION VALVE

_____ • HP2B, HPI LINE 2-2 ISOLATION VALVE

4. **Control Injection Flow** as follows:

_____ a. Discuss AND implement strategy for controlling injection flow with the Command SRO based on guidance provided in step 4 of this attachment.

CAUTION 4.b

A rise in pressure may occur when adding water from the High Pressure Injection System. Figure 1 of DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture provides a curve for Pressure vs. Temperature Limits.

_____ b. Maintain RCS pressure less than the maximum limits of Figure 1 of DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture.

CAUTION 4.c

Superheated incore thermocouple readings indicate inadequate core cooling is being provided. Unless additional core cooling is provided, core damage will result. Severe Accident Management Guidelines provide direction if core cooling can not be established.

_____ c. Monitor incore thermocouple temperatures as an indication of the effectiveness of the injection flowpath.

_____ d. Throttle injection flow to maximize the time HPI will be available as an injection source using the following guidance:

- Throttle HPI flow to maintain hot leg level constant below any known openings. Incore thermocouple temperatures will rise to the boiling point. HPI flow will replace the inventory lost by boiling and steam flow out of the core.

- If there are no known openings, throttle HPI flow to maintain incore thermocouples constant or slightly lowering.

_____ e. Providing water to the BWST will extend the period of time this method would be available.

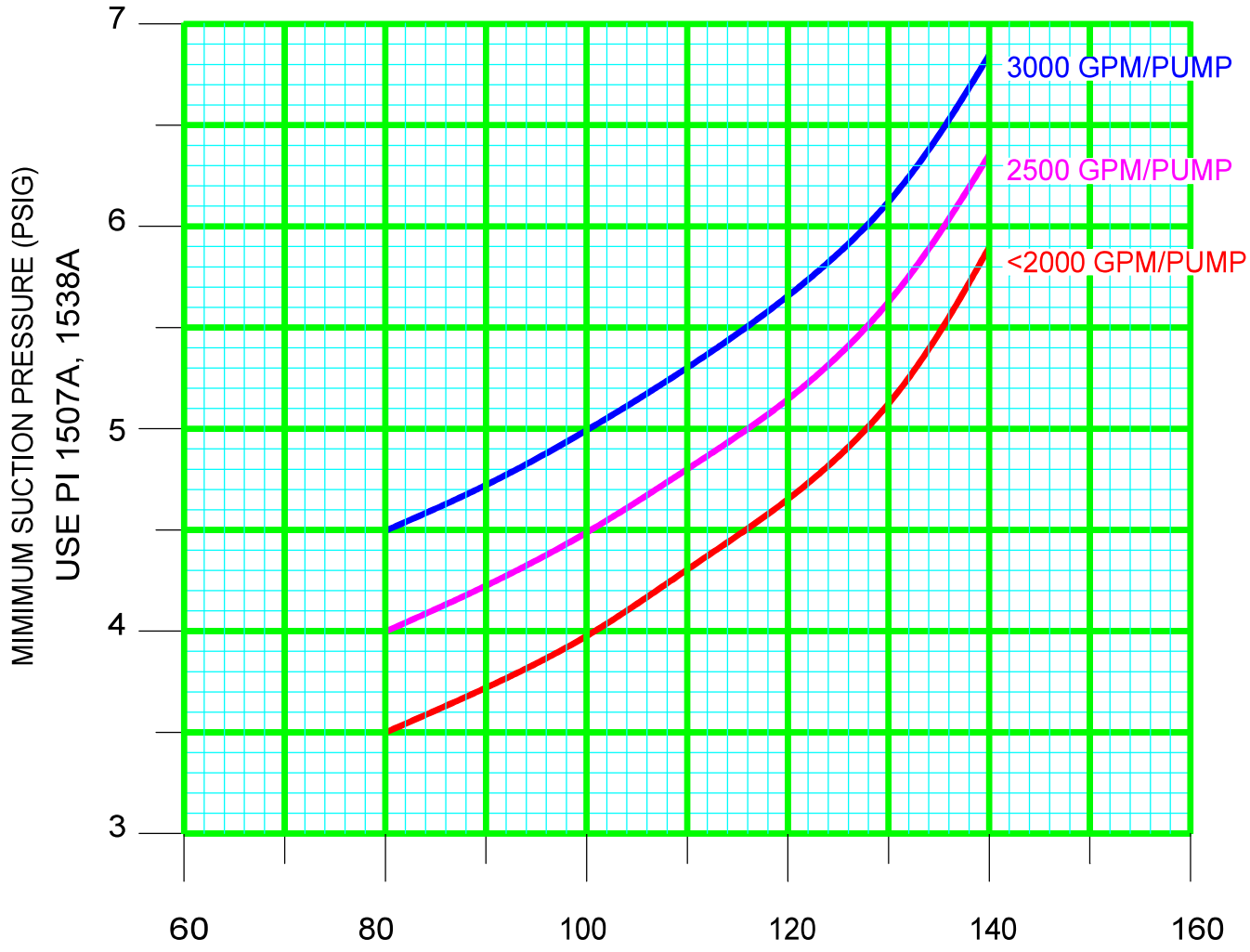
_____ f. IF a CTMT Spray Pump is available,
WHEN adequate inventory exists in the Emergency Sump,
THEN lineup the CTMT Spray Pump to take suction on the Emergency Sump and recirculate the water back to the BWST via the Recirc test line.
Seek additional guidance from the Emergency Response Organization as necessary.

_____g. Refer to DB-OP-06011, High Pressure Injection System Operating Procedure for precautions and limitations.

_____h. IF an ELAP is in progress,
THEN record time that BWST gravity drain to the RCS commenced.
REFER TO DB-OP-02714, Shutdown RCS Makeup.

Clock Time:_____

DECAY HEAT MINIMUM SUCTION PRESSURE
VS.
RCS TEMPERATURE

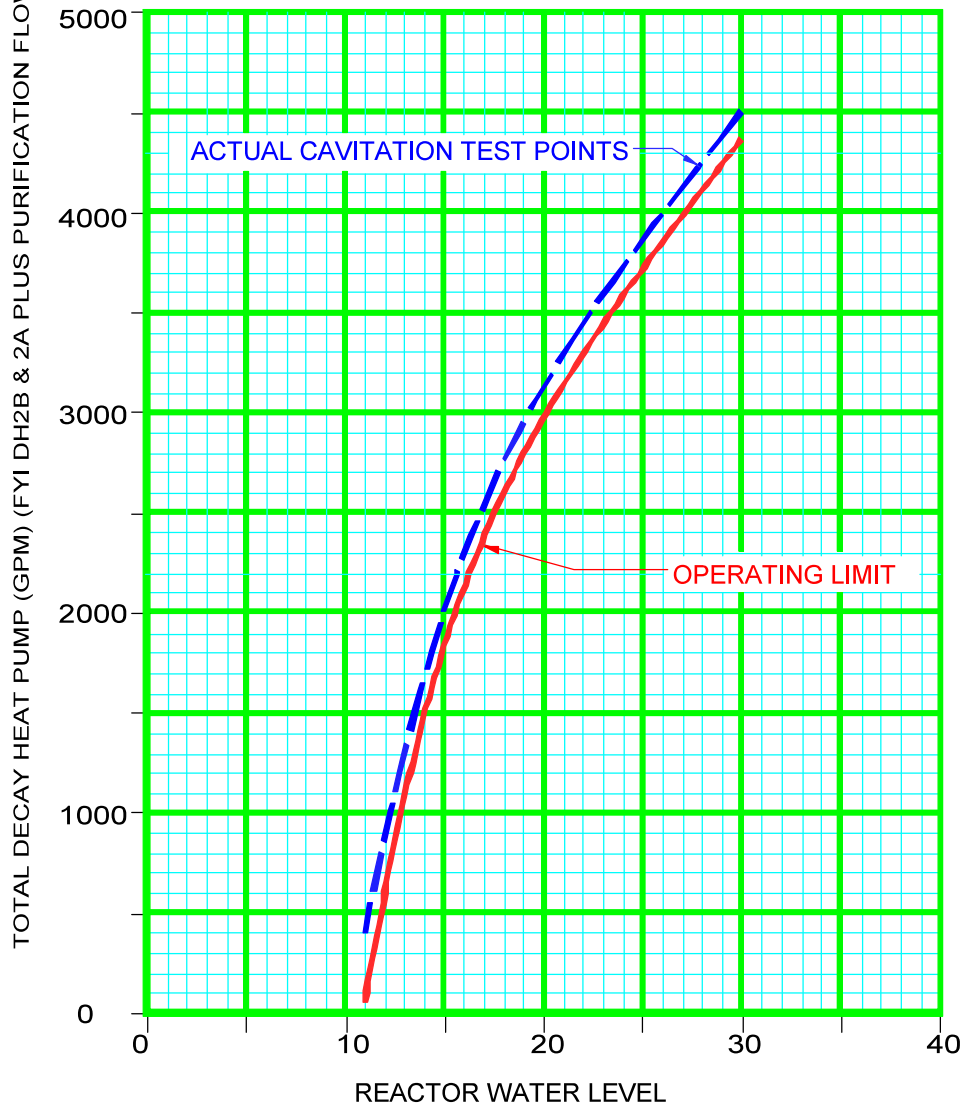


(USE DECAY HEAT SUCTION TEMPERATURE TI DH8B, A)

Note 1: This is only a guide. If any unusual noise or discharge pressure variation occurs, the suction pressure should be raised, or the pump tripped. Pump performance should still follow pump head curve. No instrument error was included.

Note 2: This curve is based on DH11 and DH12 flow path. Flow through DH21 and DH23 may require a lower flow for a given suction pressure versus temperature. The minimum suction pressures on the curve should be observed.

PREDICTED TOTAL DECAY HEAT FLOW FOR ACTUAL PUMP CAVITATION
VS
REACTOR WATER LEVEL



CC6.4
Notification 60057605

CAUTION: This curve is for guidance only. This curve should not be exeeded or loss of pump NPSH may occur. The actual test points are points at which either pump NPSH was lost or pump suction pressure was low causing excessive pump cavitation.

Rx Water Level	Actual Test Point	Adjusted Operating Limit Curve
30"	4500	4360 GPM
18"	2750	2590
11"	400	50

Simulator JPM e

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-284

Task Title: Commence a Rapid Cooldown of the RCS via TBVs and AVVs

Task No: 000-081-04-0100 **System:** 041 Steam Dump / Turbine Bypass Control

K/A Reference: 041 K3.01 (3.7) R3 **Safety Function**: 4S Heat Removal from the Core

Time Critical Task: No **Alternate Path:** Yes

Validation Time: 20 minutes

Method of testing:

Simulated Performance ____ Actual Performance __X__

Classroom ____ Simulator __X__ Plant ____

Task Standard:

- Commence a Rapid Cooldown of the RCS via Both Trains of TBVs in hand
- Transfer cooldown to Both AVVs when the TBVs fail close prior to SFRCS Actuation

Required Materials:

- DB-OP-02543 pg. 10-12
- DB-OP-02000 Attachment 3 (Operator Aid)

General References:

None

Notes:

- Time will be needed for trace to erase from SPDS
- Verify DB-OP-02000 Attachment 3 operator aid is clean prior to performing JPM

Initial Conditions:

The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:

The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

SIMULATOR INSTRUCTIONS

INITIAL CONDITION:

Reactor tripped with the Main Condenser available

Supplemental actions of DB-OP-02000 complete

IC424

ADDITIONAL SETUP/DEVIATION FROM INITIAL CONDITION:

DB-OP-02543 complete up through 4.12.1

*PLACE COOLDOWN CURVE ON SPDS AND SELECT TO FRONT SCREEN-**100°F/Hr***

MALFUNCTIONS/FAILURE TO INSERT:

3 minutes after TBVs taken to HAND - Fail all TBVs closed

Event File
Event 1
L2012ah==1&&L2012bh==1

Schedule File
Insert malfunction SA34B after 180 on event 1
SP13B3 ATO VLV FAIL CLOSED
Insert malfunction SA33B after 180 on event 1
SP13B2 ATO VLV FAIL CLOSE
Insert malfunction SA32B after 180 on event 1
SP13B1 ATO VLV FAIL CLOSE
Insert malfunction SA46B after 180 on event 1
SP13A3 ATO VLV FAIL CLOSE
Insert malfunction SA45B after 180 on event 1
SP13A2 ATO VLV FAIL CLOSE
Insert malfunction SA44B after 180 on event 1
SP13A1 ATO VLV FAIL CLOSE

EVALUATOR COPY

INITIAL CONDITIONS:

The Reactor was tripped and the supplemental actions of DB-OP-02000 have been completed.

Preparations to place the Motor Driven Feed Pump in service are in progress.

The Shift Manager has determined a Rapid Cooldown to mode 5 is required. DB-OP-02543, Rapid Cooldown is in progress.

INITIATING CUES:

The CSRO has directed you to establish an 80-100°F/Hr Cooldown Rate starting at step 4.12.2 of DB-OP-02543, Rapid Cooldown.

(Provide DB-OP-02543, Rapid Cooldown, Step 12 to the examinee.)

CANDIDATE COPY

INITIAL CONDITIONS:

The Reactor was tripped and the supplemental actions of DB-OP-02000 have been completed.

Preparations to place the Motor Driven Feed Pump in service are in progress.

The Shift Manager has determined a Rapid Cooldown to mode 5 is required. DB-OP-02543, Rapid Cooldown is in progress.

INITIATING CUES:

The CSRO has directed you to establish an 80-100°F/Hr Cooldown Rate starting at step 4.12.2 of DB-OP-02543, Rapid Cooldown.

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT critical unless denoted in the "Comments".

START TIME: _____

1. PERFORMANCE STEP: Place the Turbine Bypass Valves in HAND
……..C…….

   STANDARD: Depresses hand pushbutton for side 1 and side 2 TBVs.
   Verifies White light lit, red light off

   CUE: **None**

SAT UNSAT

2. PERFORMANCE STEP: Open Turbine Bypass Valves to commence cooldown
……..C…….

   STANDARD: Toggle Turbine Bypass valves side 1 and side 2 to open
   Verifies Amber lights lit above ICS control station

   CUE: **If necessary, Another Operator will respond to ICS Mismatch alarm and control RCS inventory and pressure during RCS cooldown.**

SAT UNSAT

3. PERFORMANCE STEP: Attempts to establish 80 - 100 °F Cooldown of the RCS

   STANDARD: Depresses open on TBV controls to attempt to establish cooldown of 80 - 100 °F/hr Monitors SPDS Cooldown graph. (~ 1.33 – 1.67 °F/min).

   COMMENT: Actual Cooldown rate of 80 - 100 °F not critical as TBVs will fail closed

   CUE: **None**

SAT UNSAT

Alternate Path Starts here.
3 minutes after TBVs are place in hand, the TBVs will fail closed. This will stop the RCS cooldown. The Examinee must recognize the failure and refer to step 4.12.2 RNO or step 4.12.3 which provides guidance on the use of the AVVs to continue the cooldown.

4. PERFORMANCE STEP: Recognizes Turbine Bypass Valves fail to maintain cooldown

   STANDARD: Observes amber lights not lit. Plant commences to heat up. TBVs do not respond to control station.

   CUE: (The operator may initially try to troubleshoot TBVs)
   If necessary, ask examinee what other methods are available for cooldown? Once examinee IDs AVVs are available, CUE Unit Supervisor directs you to continue with the Cooldown in accordance with step 4.12 of DB-OP-02543, Rapid Cooldown using AVVs (RNO step).

   SAT UNSAT

5. PERFORMANCE STEP: Place SG 1 AVV Hand/Auto Station in HAND
   ……..C…….

   STANDARD: Positions slider up to hand on PIC ICS11B

   COMMENT: It is acceptable to place SG 2 AVV in HAND prior to SG 1 AVV
   For procedural guidance may refer to DB-OP-02000, Attachment 3: Operation of AVVs which includes the following additional steps which are NOT CRITICAL:
   1. Reduce SG 1 AVV demand to zero
   2. Press SG 1 AVV BLOCK pushbutton
   3. Press AUTO SG 1 AVV Hand Indicating Switch

   CUE: **None**

   SAT UNSAT

6. PERFORMANCE STEP: Begin to control Steam Generator Pressure as required to
   ……..C……. establish a cooldown

   STANDARD: Incrementally increases PIC ICS11B demand controller output
   Monitor SPDS Cooldown graph to establish a cooldown

   CUE: **None**

   SAT UNSAT

7. PERFORMANCE STEP: Place SG 2 AVV Hand/Auto Station in HAND
……..C…….

STANDARD: Positions slider up to hand on PIC ICS11A

COMMENTS: For procedural guidance may refer to DB-OP-02000, Attachment 3: Operation of AVVs which includes the following additional steps which are NOT CRITICAL:

1. Reduce SG 2 AVV demand to zero
2. Press SG 2 AVV BLOCK pushbutton
3. Press AUTO SG 2 AVV Hand Indicating Switch

CUE: **None**

_____
SAT UNSAT

8. PERFORMANCE STEP: Begin to control Steam Generator Pressure as required to
……..C……. establish a cooldown

STANDARD: Incrementally increases PIC ICS11A demand controller output
Monitor SPDS Cooldown graph to establish a cooldown

CUE: **None**

_____
SAT UNSAT

TERMINATING CUES: This JPM is complete (Terminated by the examiner)

_____
END TIME

NOTE: Wipe clean Attachment 3 operator aid if used.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
SRO 4.11 IF RCPs are in service, THEN maintain RCS Pressure vs. Temperature. REFER TO DB-PF-06703, CC 1.4, RCS Pressure/Temperature Limits for Cooldown with Forced Circulation.	___ IF RCPs are NOT in service, THEN maintain RCS Pressure vs. Temperature. REFER TO DB-PF-06703, CC 1.14, RCS Pressure and Temperature Limits for Cooldown with Natural Circulation.
4.12 Begin RCS cooldown, depressurization and RCS Boration as follows:	
SRO 1. Verify 1% Shutdown Value for the current RCS Boron Concentration assuming a Tavg of 500°F (Group 1 rods will not be with drawn for trippable reactivity).	
___ 2. IF the condenser is available, THEN place the Turbine Bypass Valves in HAND.	___ IF the condenser is NOT available, THEN place the Atmospheric Vent Valves in HAND.
___ 3. Open the TBVs or AVVs as necessary to attain the desired cooldown rate. • 100° F/Hr maximum with Tc >270°F • 50°F/Hr maximum on Natural Circulation • 50°F/Hr maximum with Tc <270°F	
___ 4. IF RCPs are operating, THEN use Pressurizer spray and heaters as necessary to control RCS pressure (100 °F/Hr Max Pressurizer Cooldown Rate).	___ IF RCPs are NOT operating, THEN vent the Pressurizer to the quench tank and use Pressurizer heaters as necessary to control RCS pressure. REFER TO DB-OP-06903, Plant Cooldown Section 6.0 (100 °F/Hr Max Pressurizer Cooldown Rate).

CARRY-OVER STEPS	
Condition	**Step**
IF AT ANY TIME it is required to maintain MU Tank level using the BWST, THEN perform Attachment 1, Maintaining MU Tank Level using the BWST.	4.7

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
___ 4.13 IF a ΔP of greater than 20 psi exists between the steam lines, THEN balance Main Steam Line pressures using TBVs OR AVVs before reducing Main Steam Line pressure below 720 psig.	
___ 4.14 Maintain Main Steam Line pressure above 650 psig, until the SFRCS block is in effect.	
4.15 Verify the following conditions are met PRIOR to blocking the SFRCS low pressure and high level trips: ___ • IF the MDFP is in service, THEN verify BOTH MFPs are tripped. ___ • IF a MFP is capable of supplying feedwater to the SGs, THEN verify Steam Generator levels are being maintained less than 50 inches. ___ • Verify the RCS is borated to the Boron Concentration to Ensure 1% Shutdown Value for T_{AVG} of 300°F < T_{AVG} <500°F (transient poison reactivity may be credited).	
___ 4.16 WHEN Main Steam Line pressure is less than 720 psig, THEN block the SFRCS Low SG Pressure and High SG Level trips.	
___ 4.17 IF four RCPs are running, THEN prior to 440°F T_{COLD}, shutdown one RCP (S/D Loop 1 RCP preferred to maximize Pressurizer Spray capability). REFER TO DB-OP-06005, RC Pump Operation.	

Simulator JPM
f

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-338 (NEW)

Task Title: Manually start both CSS trains after SFAS Level 4 signal

Task No: 026-002-05-0100 **System:** 026 Containment Spray System

K/A Reference: 026 A4.01 (3.9) R3 **Safety Function**: 5 Containment Integrity

Time Critical Task: No **Alternate Path:** No

Validation Time: 10 minutes

Method of testing / Location:

Simulated Performance ___ Actual Performance _X_

Classroom ___ Simulator _X_ Plant ___

Task Standard:
Start both Containment Spray Pumps and open their respective discharge valves.

Required Materials:
DB-OP-06013 R29 Section 5.2 and 5.3.

General References:
None

Notes:
None.

Initial Conditions:
The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:
The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

.

SIMULATOR INSTRUCTIONS:

INITIAL CONDITION:

A LOCA has occurred

Containment pressure has exceeded the SFAS Level 4 setpoint

Containment Spray Pumps have not started

IC427

ADDITIONAL SETUP/DEVIATION FROM INITIAL CONDITION:

Insert malfunction that inhibits start of both containment spray pumps and opening of CS discharge valves.

Both containment spray pump discharge valves, (CS1530 and CS1531) are closed.

MALFUNCTIONS/FAILURE TO INSERT:

None

EXAMINER COPY

INITIAL CONDITIONS:

A LOCA has occurred

Containment pressure has exceeded the SFAS Level 4 setpoint

Containment Spray pumps have not started

INITIATING CUES:

The Command SRO has directed you to manually start Containment Spray pumps 1 and 2 and spray containment in accordance with DB-OP-06013, Section 5.2 and 5.3.

(Provide examinee a copy of DB-OP-06013, Section 5.2 and 5.3)

CANDIDATE COPY

INITIAL CONDITIONS:

A LOCA has occurred

Containment pressure has exceeded the SFAS Level 4 setpoint

Containment Spray pumps have not started

INITIATING CUES:

The Command SRO has directed you to manually start Containment Spray pumps 1 and 2 and spray containment in accordance with DB-OP-06013, Section 5.2 and 5.3.

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT critical unless denoted in the "Comments".

START TIME: _____

Note: Spray pumps can be started in either sequence.

1. PERFORMANCE STEP: Step 5.2.1: Verify DH7B, BWST ISOLATION VALVE, is OPEN

   STANDARD: Observes DH7B RED light ON, GREEN light OFF

   CUE: **None**

   SAT UNSAT

2. PERFORMANCE STEP: Step 5.2.2: OPEN CS1530, CTMT SPRAY DISCH
   .....C.....

   STANDARD: Presses OPEN on HIS 1530. Observes RED light ON, GREEN light OFF

   CUE: **None**

   SAT UNSAT

3. PERFORMANCE STEP: Step 5.2.3: Start CTMT SPRAY PUMP 1
   .....C.....

   STANDARD: Rotates HIS 1533 to Start and releases. Observes amp increase, RED light ON and GREEN light OFF.

   CUE: **None**

   SAT UNSAT

4. PERFORMANCE STEP: Step 5.2.4: Verify flow indicated on FI1547, CS PUMP 1 DISCH FLOW

   STANDARD: Observe flow indication between 1100 GPM and 1900 GPM. Acknowledge Alarms 3-1-J, CS PMP 1 DISCH FLOW LO, and/or 3-3-J CS PMP 1 DISCH FLOW HI, as applicable. Observe alarm annunciators extinguish.

   CUE: **None**

   SAT UNSAT

5. PERFORMANCE STEP: Step 5.3.1: Verify DH7A, BWST ISOLATION VALVE, is OPEN

   STANDARD: At SFAS panel verifies that DH7A GREEN light OFF and RED light ON

   CUE: **None**

SAT UNSAT

6. PERFORMANCE STEP: Step 5.3.2: OPEN CS1531, CTMT SPRAY DISCH
   .....C.....

   STANDARD: Presses OPEN on HIS 1531. Observes RED light ON, GREEN light OFF

   CUE: **None**

SAT UNSAT

7. PERFORMANCE STEP: Step 5.3.3: Start CTMT SPRAY PUMP 2
   .....C.....

   STANDARD: Rotates HIS 1532 to Start and releases. Observes amp increase, RED light ON and GREEN light OFF

   CUE: **None**

SAT UNSAT

8. PERFORMANCE STEP: Step 5.3.4: Verify flow indicated on FI1535, CS PUMP 2 DISCH FLOW

   STANDARD: Observe flow indication between 1100 GPM and 1900 GPM. Acknowledge Alarms 3-2-J, CS PMP 2 DISCH FLOW LO, and/or 3-4-J, CS PMP 2 DISCH FLOW HI, as applicable. Observe alarm annunciators extinguish.

   CUE: **None**

SAT UNSAT

TERMINATING CUE: Another operator will complete the procedure. The JPM is complete.

END TIME

NOTE 5.2

This procedure section assumes that Containment Spray Train 1 is in its normal Emergency Standby configuration or lineup.

5.2 Containment Spray Pump 1 Manual Operation

Prerequisites

None

Procedure

_____ 5.2.1 Verify DH7B*, BWST ISOLATION VALVE, is open.

_____ 5.2.2 Verify CS1530, CTMT SPRAY DISCH, open or throttled using HIS1530.

NOTE 5.2.3

Annunciator 1-6-A, INV YV1-YV3 TRBL may come into alarm due to a short term voltage droop during the pump start.

_____ 5.2.3 Start CTMT SPRAY PUMP 1, using HIS1533.

_____ 5.2.4 Verify flow indicated on FI1547, CS PUMP 1 DISCH FLOW.

_____ 5.2.5 IF Manual Operation of CTMT SPRAY PUMP 1 is complete, THEN stop CTMT SPRAY PUMP 1, using HIS1533.

_____ 5.2.6 IF a SFAS Incident Level 2 has NOT actuated, THEN close CS1530, CTMT SPRAY DISCH, using HIS1530.

Subsection 5.2 completed by _____ Date _____

* Controlled by DB-OP-00008, Operation and Control of Locked Valves.

NOTE 5.3

This procedure section assumes that Containment Spray Train 2 is in its normal Emergency Standby configuration or lineup.

5.3 Containment Spray Pump 2 Manual Operation

Prerequisites

None

Procedure

_____ 5.3.1 Verify DH7A*, BWST ISOLATION VALVE, is open.

_____ 5.3.2 Verify CS1531, CTMT SPRAY DISCH, open or throttled using HIS1531.

NOTE 5.3.3

Annunciator 1-6-K, INV YV2-YV4 TRBL may come into alarm due to a short term voltage droop during the pump start.

_____ 5.3.3 Start CTMT SPRAY PUMP 2, using HIS1532.

_____ 5.3.4 Verify flow indicated on FI1535, CS PUMP 2 DISCH FLOW.

_____ 5.3.5 IF Manual Operation of CTMT SPRAY PUMP 2 is complete, THEN stop CTMT SPRAY PUMP 2, using HIS1532.

_____ 5.3.6 IF a SFAS Incident Level 2 has NOT actuated, THEN close CS1531, CTMT SPRAY DISCH, using HIS1531.

Subsection 5.3 completed by _____ Date _____

* Controlled by DB-OP-00008, Operation and Control of Locked Valves.

Simulator JPM g

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-163

Task Title: Restore Power to D2 from EDG 2 following a LOOP and SBODG Failure

Task No: 000-032-05-0100 **System:** 062 AC Distribution System

K/A Reference: 062 K6.13 (3.4) **Safety Function**: 6 Electrical

Time Critical Task: No **Alternate Path:** Yes

Validation Time: 12 minutes

Method of testing:

Simulated Performance ___ Actual Performance _X_

Classroom ___ Simulator _X_ Plant ___

Task Standard:

- Lineup to restore power to D2 from the SBODG
- When the SBODG fails to start, repower D2 from EDG 2

Required Materials:

- Attachment 5 of DB-OP-02000 R33 Section A: MDFP
- Attachment 6 of DB-OP-02000 R33 Section 2.0

General References:

None

Notes:

None

Initial Conditions:

The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:

The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

SIMULATOR INSTRUCTIONS

INITIAL CONDITION:

Mode 3

IC426

ADDITIONAL SETUP/DEVIATION FROM INITIAL CONDITION:

1. Loss of offsite power
2. SBODG Fail to start
3. Loss of both AFPs
4. EFW Pump OOS

MALFUNCTIONS/FAILURE TO INSERT:

1. Loss of offsite power – **IMF P8RFC**
2. AFW pump 1 fails to start - **IMF SFEHB**
3. AFW pump 2 fails to start - **IMF SFEPB**
4. SBODG fails to start -

ACTION/CUES:

Place/Remove Caution Tag on EFW Pump Start Switch

EXAMINER COPY

INITIAL CONDITIONS:

A loss of offsite power has occurred from 100% power

Both AFW pumps have failed to start and deliver flow to the Steam Generators

The EFW Pump is OOS

INITIATING CUES:

You are the BOP Reactor Operator.

You have been directed by the CSRO to repower bus D2 and place the MDFP in service.

REFER TO
- Attachment 5: Guidelines for Restoring Feedwater
- Attachment 6: Reenergization of Buses D2, F7, AND MCC F71

All other plant actions are being performed by other operators

Provide the examinee
1. **Attachment 5 of DB-OP-02000 Section A: Motor Driven Feedwater Pump**
2. **Attachment 6 of DB-OP-02000**

CANDIDATE COPY

INITIAL CONDITIONS:

A loss of offsite power has occurred from 100% power

Both AFW pumps have failed to start and deliver flow to the Steam Generators

The EFW Pump is OOS

INITIATING CUES:

You are the BOP Reactor Operator.

You have been directed by the CSRO to repower bus D2 and place the MDFP in service.

REFER TO
- Attachment 5: Guidelines for Restoring Feedwater
- Attachment 6: Reenergization of Buses D2, F7, AND MCC F71

All other plant actions are being performed by other operators

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT assumed unless denoted in the "Comments".

START TIME: _____

1. PERFORMANCE STEP: Locate the correct Section of Attachment 5

   STANDARD: Identifies Section A as the correct Section

   CUE: **None**

   _____
   SAT UNSAT

2. PERFORMANCE STEP: Route to Attachment 6 to energize Bus D2 and start the MDFP (Attachment 5 Section A Step 1)

   STANDARD: Identifies D2 as deenergized and routes to Attachment 6

   CUE: **None**

   _____
   SAT UNSAT

3. PERFORMANCE STEP: Determine source of power for D2 bus (Attachment 6 description)

   STANDARD: Consult with the Command SRO to determine most desirable source for Bus D2 that is available
   Routes to Section 2.0 of Attachment 6

   CUE: **If asked, the CSRO concurs the most desirable source for Bus D2 is the SBODG**

   _____
   SAT UNSAT

4. PERFORMANCE STEP: Check AD213 is closed (Attachment 6 Section 2 Step 2.1)

   STANDARD: Observe AD213 Red light is LIT on HS 11118

   CUE: **None**

   _____
   SAT UNSAT

5. PERFORMANCE STEP: Verify ABDD2 is open (Attachment 6 Section 2 Step 2.2)
.....C.....

STANDARD: Rotate HIS 6228, ABDD2, BUS TIE XFMR BD, to TRIP, Observe Green light is LIT, Red light goes OFF

CUE: **None**

SAT UNSAT

6. PERFORMANCE STEP: Verify AD110 is open (Attachment 6 Section 2 Step 2.3)

STANDARD: Observes Breaker AD110 GREEN light is lit on HIS 6233

CUE: **None**

SAT UNSAT

ALTERNATE PATH STARTS HERE
The SBODG will NOT start, D2 will be powered from EDG 2 via D1.

7. PERFORMANCE STEP: Attempt to start the SBODG (Attachment 6 Section 2 Step 2.4)
.....C.....

STANDARD: Press START pushbutton, HS 11085 on Panel C5740 in the Control Room.
Recognizes the speed remains at 0 RPM
Reports SBODG failed to start to Shift Supervisor
Route to Section 3.0 of Attachment 6: Reenergization of Bus D2 from Bus D1

CUE: **SM acknowledges the SBODG failed to start**
If asked, concur with restoring power to D2 from D1.
If necessary, then direct the BOP to restore feedwater, by use of Attachment 5 and 6 of DB-OP-02000.

SAT UNSAT

8. PERFORMANCE STEP: Verify AD301, SBODG BKR is open

NOTE: JPM Steps 8-15 can be performed in any order.
(Attachment 6 Section 3 Step 3.1 1). bulleted steps)

STANDARD: Observes Breaker AD301 GREEN light is lit

CUE: **None**

SAT UNSAT

9. PERFORMANCE STEP: Verify AD205, XFMR BDF6 is open

   STANDARD: Observes Breaker AD205 GREEN light is lit

   CUE: **None**

SAT UNSAT

10. PERFORMANCE STEP: Verify AD206, CLNG WTR PMP 2 is open

    STANDARD: Observes Breaker AD206 GREEN light is lit

    CUE: **None**

SAT UNSAT

11. PERFORMANCE STEP: Verify AD201, STA AIR CMPSR 2 is open or place in lock out

    STANDARD: Observes Breaker AD201 GREEN light is lit or place HIS in lock out

    CUE: **None**

SAT UNSAT

12. PERFORMANCE STEP: Verify AD202, CLNG TWR MU PMP 2 is open

    STANDARD: Observes Breaker AD202 GREEN light is lit

    CUE: **None**

SAT UNSAT

13. PERFORMANCE STEP: Verify AD204, HTR DRN PMP 2 is open

    STANDARD: Observes Breaker AD204 GREEN light is lit

    CUE: **None**

SAT UNSAT

14. PERFORMANCE STEP: Verify AD207, CNDS PMP 2 is open

    STANDARD: Observes Breaker AD207 GREEN light is lit

    CUE: **None**

SAT UNSAT

15. PERFORMANCE STEP: Verify AD210, MOTOR DRIVEN FEED PUMP is open

    STANDARD: Observes Breaker AD210 GREEN light is lit

    CUE: **None**

    _____
    SAT UNSAT

16. PERFORMANCE STEP: Verify Open ABDD2 using HIS 6228 (Attachment 6 Section 3 Step 3.1 2).)

    STANDARD: Observes Breaker ABDD2 GREEN light is lit

    NOTE: Performed in JPM Step 5

    CUE: **None**

    _____
    SAT UNSAT

17. PERFORMANCE STEP: Place D1 SYNC SELECT in the BKR to D2 position **.....C.....** (Attachment 6 Section 3 Step 3.1 3).)

    STANDARD: Install knob and rotate D1 SYNC SELECT to the BKR to D2 position

    CUE: **If needed, SM concurs DG 2 SYNC is the D1 SYNC SELECT switch**

    _____
    SAT UNSAT

18. PERFORMANCE STEP: Close AD110, HIS 6233 (Attachment 6 Section 3 Step 3.1 4).) **.....C.....**

    STANDARD: Close AD110 using HIS 6233
    Check indicating lights change to Red ON and Green OFF
    Verify D2 is energized by observing correct voltage (Step 3.1 5).)

    CUE: **None**

    _____
    SAT UNSAT

19. PERFORMANCE STEP: Place D1 SYNC SELECT in the OFF position (Attachment 6 Section 3 Step 3.1 6).)

    STANDARD: Rotate D1 SYNC SELECT to the OFF position

    CUE: **None**

    _____
    SAT UNSAT

20. PERFORMANCE STEP: Verify AD2DF7 is closed (Attachment 6 Section 3 Step 3.1 7).)

    STANDARD: Observe AD2DF7 Red light is LIT

    CUE: None

    _____
    SAT UNSAT

21. PERFORMANCE STEP: Verify BDF7 is closed (Attachment 6 Section 3 Step 3.1 8).)

    STANDARD: Observe BDF7 Red light is LIT

    CUE: None

    _____
    SAT UNSAT

22. PERFORMANCE STEP: Check load on EDG 2 (Attachment 6 Section 3 Step 3.2)

    STANDARD: Check load on EDG 2 is less than 2250 KW.
    GO TO Attachment 5, Section A, MDFP (Attachment 6 Section 3 Step 3.3)

    CUE: **None**

    _____
    SAT UNSAT

TERMINATING CUES: This JPM is complete. (Terminated by the evaluator)

_____
END TIME

ATTACHMENT 6: REENERGIZATION OF BUSES D2, F7, AND MCC F71

This attachment provides guidance for reenergizing Bus D2, Bus F7, and MCC F71, by providing the necessary major steps without addressing any specific complications. If complications exist, the appropriate system operating procedure may have to be consulted. For example, a D2 Lockout must have the lockout condition cleared and the lockout reset prior to energizing D2. A lockout can be recognized by all D2 source and load breaks open and an inability to close any source breakers.

Consult with the Command SRO to determine most desirable source for Bus D2 that is available, and proceed per the table below. While the sources are listed in descending order of desirability, the Command SRO may select any source based on actual plant conditions.

Source	Section	Remarks
Bus B	1.0	Assumes Startup Transformer 01 OR 02 is energized.
SBODG	2.0	Assumes offsite power is NOT available.
Bus D1/EDG 2	3.0	Assumes offsite power NOT available, EDG 2 on Bus D1, EDG 2 load is less than or equal to 2250 KW prior to starting the MDFP.
Bus C1/EDG 1	4.0	Assumes offsite power and EDG 2 NOT available, EDG 1 on Bus C1, EDG 1 load is less than or equal to 2250 KW prior to starting the MDFP
Bus A	5.0	Assumes Startup Transformer 01 OR 02 is energized.

This attachment also contains directions for reducing EDG Load, if necessary, prior to starting the MDFP.

Section 6, Reduction of EDG 2 Load to Allow MDFP Start

Section 7, Reduction of EDG 1 Load to Allow MDFP Start

ATTACHMENT 6: REENERGIZATION OF BUSES D2, F7, AND MCC F71

1.0 Reenergization of Bus D2 from Bus B

_____ 1.1 IF Bus B is deenergized,
THEN reenergize Bus B from offsite power as follows:

1). Verify the following Bus B Load Breakers are open:

_____ • RCP 1-2, HIS RC5B2, RCP 1-2

_____ • RCP 2-1, HIS RC5A1, RCP 2-1

_____ • Circ Pump 2, HIS 881, CIRC WATER PUMP 2

_____ • Circ Pump 4, HIS 929, CIRC WATER PUMP 4

_____ 2). Place Bus B SYNC CHECK to 01 or 02 position.

_____ 3). Allow 15 seconds for the Sync Check relay to actuate.

4). Close desired supply breaker for Bus B

_____ • HX01B, HIS 6209, HX01B

_____ • HX02B, HIS 6210, HX02B

_____ 5. Place Bus B SYNC CHECK to the OFF position.

1.2 Reenergize Bus D2 from Bus B via BD Transformer as follows:

_____ 1). Verify ABDC1 is open, HIS 6220, ABDC1

_____ 2). Verify ABDD2 is open, HIS 6228, ABDD2

_____ 3). Verify AD 110 is open, HIS 6233, AD110

_____ 4). Close HBBD, HIS 6214, HBBD

_____ 5). Close ABDD2, HIS 6228, ABDD2

_____ 6). Verify D2 is energized.

_____ 7). Verify AD2DF7 is closed.

_____ 8). Verify BDF7 is closed.

_____ 1.3 IF Motor Driven Feed Pump (MDFP) operation is required,
THEN REFER TO Attachment 5, Section A, MDFP.

_____ 1.4 IF No Instrument air compressors are in service,
THEN start an air compressor. Refer to DB-OP-06251, Station and Instrument Air System Operating Procedure.

ATTACHMENT 6: REENERGIZATION OF BUSES D2, F7, AND MCC F71

2.0 Reenergization of Bus D2 from SBODG

_____ 2.1 Check AD213 is closed (breaker closed indicates D2 is NOT Locked Out).

_____ 2.2 Verify ABDD2, BUS TIE XFMR BD is open.

_____ 2.3 Verify AD 110 is open.

_____ 2.4 Start the SBODG by pressing START at the SBODG Control Panel C5740.

_____ 2.5 Check SBODG speed approximately 900 RPM.

_____ 2.6 Close AD 301 to energize Bus D2.

_____ 2.7 Verify Bus D2 energized.

_____ 2.8 Verify AD2DF7 is closed.

_____ 2.9 Verify BDF7 is closed.

_____ 2.10 IF Motor Driven Feed Pump (MDFP) operation is required,
THEN REFER TO Attachment 5, Section A, MDFP

_____ 2.11 IF No Instrument air compressors are in service,
THEN start an air compressor. Refer to DB-OP-06251, Station and Instrument Air System Operating Procedure.

_____ 2.12 Initiate action to refuel the SBODG. Refer to DB-OP-06273, Diesel Fuel Oil Transfer.

ATTACHMENT 6: REENERGIZATION OF BUSES D2, F7, AND MCC F71

3.0 Reenergization of Bus D2 from Bus D1 (assuming EDG 2 on Bus D1)

3.1 Reenergize Bus D2 from Bus D1 as follows:

1). Verify the following breakers are open in the Control Room or at Bus D2:

_____ • AD301, SBODG BKR

_____ • AD205, XFMR BDF6

_____ • AD206, CLNG WTR PMP 2

_____ • AD201, STA AIR CMPSR 2 or place in lock out

_____ • AD202, CLNG TWR MU PMP 2

_____ • AD204, HTR DRN PMP 2

_____ • AD207, CNDS PMP 2

_____ • AD210, MOTOR DRIVEN FEED PUMP

_____ 2). Open ABDD2, HIS 6228, ABDD2

_____ 3). Place D1 SYNC SELECT in the BKR to D2 position

_____ 4). Close AD110, HIS 6233, AD110

_____ 5). Verify D2 is energized.

_____ 6). Place D1 SYNC SELECT in the OFF position.

_____ 7). Close AD2DF7.

_____ 8). Verify BDF7 is closed.

_____ 3.2 IF EDG 2 load is greater than 2250 KW
AND starting the MDFP is required,
THEN GO TO Section 6 of this attachment for load reduction guidance.

_____ 3.3 IF Motor Driven Feed Pump (MDFP) operation is required,
THEN GO TO Attachment 5, Section A, MDFP.

_____ 3.4 IF No Instrument air compressors are in service,
THEN start an air compressor. Refer to DB-OP-06251, Station and Instrument Air System Operating Procedure.

ATTACHMENT 6: REENERGIZATION OF BUSES D2, F7, AND MCC F71

4.0 Reenergization of Bus D2 from Bus C1 (assumes EDG 1 on Bus C1).

4.1 Reenergize Bus D2 from Bus C1 as follows:

1). Verify the following breakers are open in the Control Room or at Bus D2:

_____ • AD301, SBODG BKR

_____ • ABDD2, BUS TIE XFMR BD

_____ • AD205, XFMR BDF6

_____ • AD206, CLNG WTR PMP 2

_____ • AD201, STA AIR CMPSR 2 or place in lock out

_____ • AD202, CLNG TWR MU PMP 2

_____ • AD204, HTR DRN PMP 2

_____ • AD207, CNDS PMP 2

_____ • AD210, MOTOR DRIVEN FEED PUMP

_____ 2). Verify AD110 is open, HIS 6233, AD110

_____ 3). Verify HBBD is open, HIS 6214, HBBD

_____ 4). Verify AC110 is open, HIS 6223, AC110

_____ 5). Place the C1 SYNC SELECT Switch in the BKR TO XBD position.

NOTE 4.1.6

Transformer BD inrush, upon Breaker ABDC1 closure, may result in an undervoltage trip (27/C1 Relays) of the 4.16 KV Bus loads and subsequent automatic reloading of the EDG.

_____ 6). Close ABDC1, HIS 6220, ABDC1

_____ 7). Place the C1 SYNC SELECT Switch to OFF.

_____ 8). Close ABDD2, HIS 6228, ABDD2

ATTACHMENT 6: REENERGIZATION OF BUSES D2, F7, AND MCC F71

_____ 9). Verify D2 is energized.

_____ 10). Close AD2DF7.

_____ 11). Verify BDF7 is closed.

_____ 4.2 IF EDG 1 load is greater than 2250 KW
AND starting the MDFP is required,
THEN GO TO Section 7 of this attachment for load reduction guidance.

_____ 4.3 IF Motor Driven Feed Pump (MDFP) operation is required,
THEN GO TO Attachment 5, Section A, MDFP.

_____ 4.4 IF No Instrument air compressors are in service,
THEN start an air compressor. Refer to DB-OP-06251, Station and Instrument Air System Operating Procedure.

ATTACHMENT 6: REENERGIZATION OF BUSES D2, F7, AND MCC F71

5.0 Reenergization of Bus D2 from Bus A

5.1 IF Bus A is deenergized,
THEN reenergize Bus A from offsite power as follows:

1). Verify the following Bus A Load Breakers are open:

_____ • RCP 1-1, HIS RC5B1, RCP 1-1

_____ • RCP 2-2, HIS RC5A2, RCP 2-2

_____ • Circ Pump 1, HIS 876, CIRC WATER PUMP 1

_____ • Circ Pump 3, HIS 928, CIRC WATER PUMP 3

_____ 2). Place Bus A SYNC CHECK to 01 or 02 position.

_____ 3). Allow 15 seconds for the Sync Check Relay to actuate.

4). Close desired supply breaker for Bus A

_____ • HX01A, HIS 6203, HX01A

_____ • HX02A, HIS 6201, HX02A

_____ 5). Place Bus A SYNC CHECK to the OFF position.

5.2 IF D1 is deenergized,
THEN reenergize D1 via Transformer AC as follows:

_____ 1). Verify EDG 2 is shutdown.

2). Verify the following breakers are open:

_____ • AD113, CCW PUMP 2

_____ • AD108, CCW PUMP 3

_____ • AD105, MU PMP 2

_____ • AD101, EDG 2 TIE TO D1

_____ • AACD1, BUS TIE XFMR AC

_____ • AD110, BUS TIE D2

ATTACHMENT 6: REENERGIZATION OF BUSES D2, F7, AND MCC F71

_____ 3). IF C2 Bus is being supplied from EDG 1
THEN verify AACC2, HIS 6218, AACC2, is open.

_____ 4). Close HAAC, HIS 6207 HAAC

_____ 5). Place the D1 SYNC SELECT switch to the TIE BKR TO XAC position, HS 6231, SYNC SELECT.

_____ 6). Close AACD1, HIS 6230, AACD1

_____ 7). Verify Bus D1 is energized.

_____ 8). Place the D1 SYNC SELECT switch to OFF, HIS 6231, SYNC SELECT

5.3 Reenergize Bus D2 from Bus D1 as follows:

_____ 1). Verify ABDD2 is open, HIS 6228, ABDD2

_____ 2). Close AD110, HIS 6233, AD110

_____ 3). Verify Bus D2 is energized.

_____ 4). Verify AD2DF7 is closed.

_____ 5). Verify BDF7 is closed.

_____ 5.4 IF Motor Driven Feed Pump (MDFP) operation is required,
THEN GO TO Attachment 5, Section A, MDFP.

_____ 5.5 IF No Instrument air compressors are in service,
THEN start an air compressor. Refer to DB-OP-06251, Station and Instrument Air System Operating Procedure.

ATTACHMENT 6: REENERGIZATION OF BUSES D2, F7, AND MCC F71

6.0 Reduction of EDG 2 Load to Allow MDFP Start

6.1 If MU\HPI cooling is NOT established (EDG NOT loaded with a MU Pump and HPI\LPI piggybacked) the EDG load shall be reduced to allow the MDFP to be started without exceeding the 2000 hr rating of 2838 KW per Step 1 below,

OR

If MU\HPI cooling is established (EDG is loaded with a MU Pump and HPI\LPI piggybacked), the EDG load shall be reduced to allow the MDFP to be started without exceeding the 200 hr rating of 2946 KW per Step 2 below.

1. IF EDG 2 load is greater than 2250 KW on the Control Room indicator, deenergize loads in any order from the list below until EDG 2 load is equal or less than 2250 KW to allow starting the MDFP,
THEN GO TO Attachment 5, Section A, MDFP.

	LOAD	SWITCH	POSITION	KW
_____	CTMT LTG PNLS L79D2 and L79D1	CS-4	OFF	45
_____	CTMT LTG PNLS L49D1	CS-3	OFF	27
_____	CTMT RECIRC FAN 2	HIS 5035	STOP	40
_____	BORIC ACID Pump 2	HIS MU50B	STOP	4
_____	PRESSURIZER HEATERS ESSEN BANK 2	HIS RC2-B	OFF	126
_____	TURN GEAR MOTOR	HIS 2402	LOCK OUT	48
	BEARING LIFT PUMPS			
_____	1	HIS 2404	LOCK OUT	4
_____	2	HIS 2405	LOCK OUT	4
_____	3	HIS 2406	LOCK OUT	4
_____	4	HIS 2407	LOCK OUT	4
_____	5	HIS 2408	LOCK OUT	4
_____	6	HIS 2409	LOCK OUT	4

2. IF EDG 2 load is greater than 2300 KW on the Control Room indicator, deenergize the loads from Step 1 above, then the loads in any order from the list below until EDG 2 load is equal or less than 2300 KW to allow starting the MDFP,
THEN GO TO Attachment 5, Section A, MDFP.

	LOAD	SWITCH	POSITION	KW
_____	H_2 DILUTION SYS BLOWER 2	HIS 5068	STOP	16
_____	TURNING GEAR PUMP	HIS 2401	LOCK OUT	24

ATTACHMENT 6: REENERGIZATION OF BUSES D2, F7, AND MCC F71

7.0 Reduction of EDG 1 Load to Allow MDFP Start

7.1 If MU\HPI is NOT established (EDG NOT loaded with a MU Pump and HPI\LPI piggybacked), the EDG load will be reduced to allow the MDFP to be started without exceeding the 2000 hr rating of 2838 KW per Step 1 below,

OR

If MU\HPI cooling is established (EDG is loaded with a MU Pump and HPI\LPI piggybacked), the EDG load shall be reduced to allow the MDFP to be started without exceeding the 200 hr rating of 2946 KW per Step 2 below.

1). IF EDG 1 is greater than 2250 KW on the Control Room indicator, deenergize loads in any order from the list below until EDG 1 load is equal to or less than 2250 KW to allow starting the MDFP,
THEN GO TO Attachment 5, Section A, MDFP.

	LOAD	SWITCH	POSITION	KW
_____	CTMT LTG PNLS L79D3 and L79D4	CS-1	OFF	41
_____	CTMT LTG PNLS L39D1	CS-2	OFF	30
_____	CTMT RECIRC FAN 1	HIS 5034	STOP	40
_____	BORIC ACID PUMP 1	HIS MU50A	STOP	4
_____	PRESSURIZER HEATERS ESSEN BANK 1	HIS RC2-A	OFF	126

2). IF EDG 1 load is greater than 2300 KW on the Control Room indicator, deenergize the loads from Step 1 above, then the loads in any order from the list below until EDG 1 load is less than or equal to 2300 KW to allow starting the MDFP,
THEN GO TO Attachment 5, Section A, MDFP.

	LOAD	SWITCH	POSITION	KW
_____	H_2 DILUTION SYS BLOWER 1	HIS 5067	STOP	16

ATTACHMENT 5: GUIDELINES FOR RESTORING FEEDWATER

Section A: Motor Driven Feedwater Pump

_____ 1. IF Bus D2 is deenergized,
THEN REFER TO Attachment 6 to repower bus D2.

2. IF the MDFP is in the AFW Mode,
THEN perform the following:

a. Enable BOTH MDFP Discharge Valves

_____ • HIS 6460

_____ • HIS 6459

b. Close BOTH MDFP Discharge Valves

_____ • LIC 6460

_____ • LIC 6459

_____ c. Start the MDFP

ATTACHMENT 5: GUIDELINES FOR RESTORING FEEDWATER

Section A: Motor Driven Feedwater Pump (cont.)

NOTE 2.d

The MDFP Pump can be used to feed a dry SG (<16" level AND <960 psig) via the Aux Feedwater Header providing the Steam Generator Tube to Shell differential temperature meets the following:

- Less than or equal to 50°F with the tubes in tension (tubes colder than shell).
- No temperature restrictions with the tubes in compression (tubes hotter than shell).

AND

- Except during Lack of Heat Transfer OR Inadequate Core Cooling, observe the following AFW flow limits until the SG is repressurized (SG Tsat is approximately equal to RCS temperature) when restoring SG level to a single dry SG:
  - 500 gpm if **TWO** RCPs are in service in the loop with the dry SG,

    OR
  - 300 gpm if **ONE** RCP is in service in the loop with the dry SG,

    OR
  - 100 gpm if **NO** RCPs are in service in the loop with the dry SG.

CAUTION 2.d

If BOTH Steam Generators will be fed from the Motor Driven Feedwater Pump, it is preferred to establish Feedwater Flow to a single SG until level setpoint is reached prior to feeding the remaining Steam Generator in order to minimize the potential of runout for the Motor Driven Feedwater Pump.

_____ d. Establish feedwater flow to the Steam Generator(s) at less than 1000 gpm indicated flow on the MDFP Flow Indicator FI 5876.

ATTACHMENT 5: GUIDELINES FOR RESTORING FEEDWATER

Section A: Motor Driven Feedwater Pump (cont.)

_____ e. Verify proper SG level control using Specific Rule 4, Steam Generator Control.

_____ f. WHEN each SG Level is at setpoint,
THEN place the associated MDFP Discharge Valves in Automatic

_____ • LIC 6460

_____ • LIC 6459

g. Locally shift pump recirculation to the CST as follows:

_____ 1). Open AF50, AUX FEED PUMP RECIRC TO CONDENSATE STORAGE TANK 1-1

_____ 2). Open AF51, AUX FEED PUMP RECIRC TO CONDENSATE STORAGE TANK 1-2

_____ 3). Unlock AND Close AF59*, AUX FEED PUMP TO THE COND STG TK OVERFLOW.

* Controlled by DB-OP-00008, Operation and Control of Locked Valves.

ATTACHMENT 5: GUIDELINES FOR RESTORING FEEDWATER
Page 6 of 22

Section A: Motor Driven Feedwater Pump (cont.)

NOTE 3

The MDFP Pump can be used to feed a dry Steam Generator via the Main Feedwater Header providing the Steam Generator Tube to Shell differential temperature meets the following:

- Less than or equal to 50°F with the tubes in tension (tubes colder than shell).
- No temperature restrictions with the tubes in compression (tubes hotter than shell).

AND

- Flow to any Steam Generator is limited to 800 gpm (.4 mpph) until the SG is repressurized (SG Tsat is approximately equal to RCS temperature).

3. IF the MDFP is in the MFW Mode,
THEN perform the following:

_____ a. Open FW6396*, MDFP TO MFW ISOLATION.

b. Lineup Main Feedwater to SG 1 as follows:

_____ 1). Verify SP7B is in HAND AND closed.

_____ 2). Verify SP7B demand is zero.

_____ 3). Verify FW780, MFW BLOCK VALVE is closed.

_____ 4). Block AND open FW612, MFW STOP VALVE.

5). Block AND Reset SP7B using the following:

_____ • HIS SP7AB

_____ • HIS SP7CB.

* Controlled by DB-OP-00008, Operation and Control of Locked Valves.

ATTACHMENT 5: GUIDELINES FOR RESTORING FEEDWATER

Section A: Motor Driven Feedwater Pump

c. Lineup Main Feedwater to SG 2 as follows:

_____ 1). Verify SP7A is in HAND AND closed.

_____ 2). Verify SP7A demand is zero.

_____ 3). Verify FW779, MFW BLOCK VALVE is closed.

_____ 4). Block AND open FW601, MFW STOP VALVE.

5). Block AND Reset SP7A using the following:

_____ • HIS SP7BB

_____ • HIS SP7DB.

_____ d. Start the MDFP.

CAUTION 3.e

If BOTH Steam Generators will be fed from the Motor Driven Feedwater Pump, it is preferred to establish Feedwater Flow to a single SG until level setpoint is reached prior to feeding the remaining Steam Generator in order to minimize the potential of runout for the Motor Driven Feedwater Pump.

e. Establish Feedwater flow to either or both SGs at less than 800 gpm to any Steam Generator AND less than 1000 gpm indicated flow on the MDFP Flow Indicator FI 5876 as follows:

_____ • SG 1, slowly open SP7B

_____ • SG 2, slowly open SP7A

_____ 4. Verify proper SG level control using Specific Rule 4, Steam Generator Control.

_____ 5. IF it is desired to transfer the MDFP from the MFW Mode to the AFW Mode, THEN REFER TO Section E, MDFP Transfer Lineups.

Simulator JPM h

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-080

Task Title: Perform the actions for the BOP RO for a Serious Control Room Fire

Task No: 000-068-05-0100 **System:** 086 Fire Protection System

K/A Reference: 068 AA1.06 / 3.7 **Safety Function**: 8 Plant Service Systems

Time Critical Task: No **Alternate Path:** No

Validation Time: 4 minutes

Method of testing / Location:

Simulated Performance ___ Actual Performance _X_

Classroom ___ Simulator _X_ Plant ___

Task Standard:
Trip MUP 1 and Close RC11 prior to CTRM evacuation

Required Materials:
DB-OP-02519 R28, ATTACHMENT 4: BOP RO Actions Prior To Leaving the Control Room

General References:
None

Notes:
The stand-by candidate should be allowed to review the procedures and prints prior to entering the simulator to allow the JPM to start ASAP.

Initial Conditions:
The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:
The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

SIMULATOR INSTRUCTIONS

INITIAL CONDITION:

100% power with MUP 1 running

IC423

ADDITIONAL SETUP/DEVIATION FROM INITIAL CONDITION:

Trip the Reactor, Initiate and Isolate SFRCS

MALFUNCTIONS/FAILURE TO INSERT:

None

EXAMINER COPY

INITIAL CONDITIONS:

You are the BOP RO

A serious Control Room fire exists.

The Fire Brigade has been activated to respond to the Fire

The Command SRO has determined that transfer of control to the Auxiliary Shutdown Panel is required to protect the health and safety of the general public (prevent core damage).

The Reactor has been Tripped and the SFRCS has been Initiated and Isolated.

Conditions permit the Reactor Operators to perform their Control Room actions prior to abandoning the Control Room.

INITIATING CUES:

The Command SRO has directed you to perform DB-OP-02519, Serious Control Room Fire, Attachment 4, BOP Reactor Operator Actions Prior To Leaving The CTRM.

(Provide the examinee a copy of DB-OP-02519, Attachment 4)

CANDIDATE COPY

INITIAL CONDITIONS:

You are the BOP RO

A serious Control Room fire exists.

The Fire Brigade has been activated to respond to the Fire

The Command SRO has determined that transfer of control to the Auxiliary Shutdown Panel is required to protect the health and safety of the general public (prevent core damage).

The Reactor has been Tripped and the SFRCS has been Initiated and Isolated.

Conditions permit the Reactor Operators to perform their Control Room actions prior to abandoning the Control Room.

INITIATING CUES:

The Command SRO has directed you to perform DB-OP-02519, Serious Control Room Fire, Attachment 4, BOP Reactor Operator Actions Prior To Leaving The CTRM.

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT required unless denoted in the "Comments".

START TIME: _____

1. PERFORMANCE STEP: Reviews DB OP 02519, Attachment 4

   STANDARD: Identifies DB-OP-02519, Attachment 4, as the correct procedure.

   CUE: **None**

   _____
   SAT UNSAT

2. PERFORMANCE STEP: Check the Main Turbine is Tripped. (ATTACHMENT 4 Step 1)

   STANDARD: Observe Main Turbine Stop and Control Valves are closed.

   NOTE: May N/A step based on Initial Cue.

   CUE: **None**

   _____
   SAT UNSAT

3. PERFORMANCE STEP: Close RC 11, PORV BLOCK, HIS RC11, PORV BLOCK.
   .....C..... (ATTACHMENT 4 Step 2)

   STANDARD: Depress the CLOSE pushbutton for HIS RC11, PORV Block.
   Observe Green light LIT, Red light OFF.

   CUE: **None**

   _____
   SAT UNSAT

4. PERFORMANCE STEP: Check Makeup Pump 2 is OFF (ATTACHMENT 4 Step 3)

   STANDARD: Observe HIS MU24B for MUP 2 Green light is LIT

   CUE: **None**

   _____
   SAT UNSAT

5. PERFORMANCE STEP: Stop Makeup Pump 1 (ATTACHMENT 4 Step 4)
.....C.....

STANDARD: Turn HIS MU24A, Makeup Pump 1 hand switch, counterclockwise to STOP.
Observe HIS MU24A for MUP 1 Green light is LIT, Red light is OFF

CUE: **None**

_____
SAT UNSAT

TERMINATING CUES: This JPM is complete. (Terminated by evaluator)

_____
END TIME

ATTACHMENT 4: BOP REACTOR OPERATOR ACTIONS PRIOR TO LEAVING THE CONTROL ROOM
Page 1 of 2

The following actions should be completed by the BOP Reactor Operator prior to abandoning the Control Room if possible. Directions to complete actions in the field are provided if unable to complete or the actions were not successful from the Control Room due to fire damage.

_____ 1. IF the Main Turbine has not been tripped,
THEN trip the Turbine - EMERGENCY TRIP pushbuttons (C5713).

_____ 2. Close RC 11, PORV BLOCK, HIS RC11, PORV BLOCK.

_____ 3. Stop Makeup Pump 2, HIS MU24B.

_____ 4. Stop Makeup Pump 1, HIS MU24A (Makeup Pump 1 will be shut down until it can be electrically isolated from the Control Room).

_____ 5. Report to the Fire Brigade Equipment Room.

ATTACHMENT 4: BOP REACTOR OPERATOR ACTIONS PRIOR TO LEAVING THE CONTROL ROOM

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