

JOB PERFORMANCE MEASURE APPROVAL SHEET

I. JPM Title: Forcing Pressurizer Sprays

ID Number: JPM-220

Revision: 0

II. Initiated:


Developer

2/23/01
Date

III. Reviewed:


Technical Reviewer

2/23/01
Date

IV. Approved:


User Department Supervisor

2/23/01
Date


Nuclear Training Supervisor

2/26/01
Date

JOB PERFORMANCE MEASURE WORKSHEET

Facility: MP-2

Examinee: _____

JPM Number: JPM-220

Rev. 0

Task Title: Forcing Pressurizer Sprays

System: SP 2654B

Time Critical Task: Yes _____ No X

Validated Time (minutes): 15

Task No.(s): NUTIMS #

Applicable To: SRO X RO X PEO _____

K/A No.: 010-K6.03 K/A Rating: 3.2/3.6
2.1.7 3.7/4.4

Method of Testing:

Simulated Performance: _____ Actual Performance: X

Location:

Classroom: _____ Simulator: X In-Plant: _____

Task Standards:

At the completion of this JPM, the examinee will have attempted to Force Pressurizer Sprays and found the controls malfunctioning.

Required Materials

(procedures,equipment):

- Procedure SP 2654B, and data sheet 2654B-1

General References:

******* READ TO THE EXAMINEE *******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

JOB PERFORMANCE MEASURE WORKSHEET

JPM Number: JPM-220

Rev. 0

Initiating Cues: You are the PPO and have been directed to perform surveillance SP-2654B "Forcing Pressurizer Sprays"

Initial Conditions: The plant is at 100% power with no major equipment out of service.

Simulator Requirements: Initialize at 100% steady state IC. Select RX system in System Diagrams and select page 4. Mid page find and select "Control Bubbles" for HIC-100E and HIC-100F on C03.
Set all three 0-100% overrides for each to 0%, (total of 6).

Enter malfunctions RX01A and B at 0% to prevent spray valves from opening.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with an "X". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions / observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM ID NUMBER: JPM-220

TITLE: Forcing Pressurizer Sprays

START TIME: 08:00

STEP 1 — Performance Steps: Refer To OP 2304A, "Volume Control Portion of the Chemical and Volume Control System," and ENSURE pressurizer steam space aligned to vent.

GRADE ____ Standards: *Examinee should ask that the US have the vent line up checked.*

Cue: US reports that the Pressurizer Steam space is aligned to vent.

Comments:

~~~~~

STEP 2      — Performance Steps:

- a. INDICATE selected pressurizer pressure controller (C-03):
  - "PRES CNTL-X, PIC-100X"
  - "PRES CNTL-Y, PIC-100Y"
- b. INDICATE and RECORD *one* of the following from selected pressure controller:
  - Controller setpoint (black and white arrow)
  - Controller output signal
- c. RECORD pressurizer pressure (PPC or C-03).

GRADE \_\_\_\_ Standards: *Examinee determines that "X" channel is in service and, records data on form 2654B-1*

Cue: \_\_\_\_\_

Comments:

~~~~~

PERFORMANCE INFORMATION

JPM ID NUMBER: JPM-220

TITLE: Forcing Pressurizer Sprays

STEP 3 X Performance Steps: PLACE the following available pressurizer "BACKUP HTR" groups handswitch to "CLOSE" (C-03):

- "GROUP 1"
- "GROUP 2"
- "GROUP 3"
- "GROUP 4"

GRADE ____ X Standards: *Examinee places all Backup Heater control switches to "close" and the red "breaker close" lights indicate on.*

Cue: 

Comments:

PERFORMANCE INFORMATION

JPM ID NUMBER: JPM-220

TITLE: Forcing Pressurizer Sprays

STEP 4 X Performance Steps: Slowly LOWER selected pressure controller setpoint to obtain *both* of the following:

Pressurizer controller output signal
approximately 50%

"PZR SPRAY-1A, HIC-100E" and "PZR
SPRAY-1B, HIC-100F" controller output
signals start to rise

GRADE X Standards: *Examinee slowly moves the thumb wheel to lower the setpoint signal on the controller. Examinee should note that the spray controllers are not responding to change in thumb wheel movement. Examinee should make a recommendation to the US that the controls for the Spray valves are malfunctioning and that the Back Up heaters should be turned off. The Examinee could also suggest that management be notified and a TR/CR be written.*

Cue: *Examinee may suggest swapping pressure control channels to see if the problem lies with the in-service pressure controller. Swapping to the other pressure control channel will have no effect on the outcome and, therefore, may be allowed.*

Comments:

~~~~~

Comments: **After this step is completed, the JPM is considered complete.**

STOP TIME:

VERIFICATION OF JPM COMPLETION

Job Performance Measure No. JPM-220

Rev. 0

Date Performed: \_\_\_\_\_

Operator: \_\_\_\_\_

Evaluator(s): \_\_\_\_\_

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes \_\_\_\_\_ No X

Validated Time (minutes): \_\_\_\_\_

Actual Time to Complete (minutes): \_\_\_\_\_

Result of JPM: \_\_\_\_\_ (Denote by an S for satisfactory or a U for unsatisfactory)

Areas for Improvement:

## EXAMINEE HANDOUT

JPM-220

Initiating Cues: You are the PPO and have been directed to perform surveillance SP-2654B "Forcing Pressurizer Sprays"

Initial Conditions: The plant is at 100% power with no major equipment out of service.



**Form Approval**

Unit Director

Effective Date

7/28/95

PORC Mtg. No.

2-95-299

# Form Cover Sheet

**Generic Information**

Form Title

Forcing Pressurizer Sprays for Boron Equalization

Rev. No.

1

Reference Procedure

SP 2654B

Applicable Tech. Spec.

N/A

Frequency

At least once every  
7 days**This form is being used for the following:**☐ Tech Spec Surveillance☐ System Alignment☐ Other: \_\_\_\_\_☐ Maintenance Restoration  
(Retest)☐ Non-Tech Spec  
Surveillance (PM)**Specific Information**

SCHEDULE DATE

APPLICABLE MODE

N/A

TEST AUTHORIZED BY

DATE

PREREQUISITES COMPLETED (INITIALS)

PRECAUTIONS NOTED (INITIALS)

COMPLETED BY

DATE

ACCEPTED BY

DATE

APPROVED BY (DEPARTMENT HEAD OR DESIGNEE)

DATE

SHIFT SUPERVISOR NOTIFIED OF FAILED TEST

DATE

**ACCEPTANCE CRITERIA  
SATISFIED**☐ YES☐ NO**SURVEILLANCE INFORMATION****Acceptance Criteria:**

Pressurizer sprays have been forced for greater than or equal to four hours.

**Data:** 1. Initial data (check appropriate boxes):DataInitials• Selected controller: PIC-100X ☐PIC-100Y ☐• Initial value: Setpoint (psia) ☐Output signal (%) ☐

• Pressurizer pressure: \_\_\_\_\_ psia

2. Start date and time: \_\_\_\_\_ / \_\_\_\_\_ ... \_\_\_\_\_

3. Stop date and time: \_\_\_\_\_ / \_\_\_\_\_ ... \_\_\_\_\_

4. Each available charging pump operated for at least 5 minutes: \_\_\_\_\_

**COMMENTS**

If performed for Maintenance Restoration, indicate Work Order #, etc.:

List any additional comments:

# Document Action Request

**A** Initiated By: Samual Smith Date: 3/21/99 Dept: \_\_\_\_\_ Ext.: \_\_\_\_\_  
 Document No.: SP 2654B Rev. No.: 2 Chg. No.: 1  
 Title: Forcing Pressurizer Sprays for Boron Equalization and Pressurizer Heater Capacity Test

**B** Reason for Request (attach commitments, CR's AR's etc)  
Correct Section 1.2 on applicability of Forms 2654B-1 and 2654B-2

**C** Change Instructions  
Replace all pages except cover page.

**D** Temporary Change Interim Approval  
N/A (1) PORC, RI, FLS Print/Sign/Date  
N/A (2) SM/SRO on Unit Print/Sign/Date

**E** Procedure Request/Feedback Disposition  
 Priority: ☐ Perform Now ☐ Perform Later ☐ Rejected - See Comments  
 Activity: ☐ New ☐ Cancel ☐ Rev ☐ Minor Rev ☐ Temp Change ☒ Change ☐ OTC  
☐ Biennial Review ☐ Place in DNU ☐ Remove DNU ☐ Edit. Corr.  
 Comments: \_\_\_\_\_ Plant Mngt Staff Member - Interim Approval N/A

| Review Type                                     | Print                  | Sign                    | Date    | RI/DPC Print Name and Date |    |        | If Comments |
|-------------------------------------------------|------------------------|-------------------------|---------|----------------------------|----|--------|-------------|
|                                                 |                        |                         |         | Yes                        | No | Dept.  |             |
| <input type="checkbox"/>                        |                        |                         |         |                            |    |        |             |
| <input type="checkbox"/>                        |                        |                         |         |                            |    |        |             |
| <input type="checkbox"/>                        |                        |                         |         |                            |    |        |             |
| RAC 06 <input checked="" type="checkbox"/>      | James A. Jorinscay Jr. | <i>JA Jorinscay Jr.</i> | 3/21/99 |                            |    | U2-OPS |             |
| Independent <input checked="" type="checkbox"/> | James A. Jorinscay Jr. | <i>JA Jorinscay Jr.</i> | 3/21/99 | ✓                          |    | U2-OPS |             |
| Validation <input type="checkbox"/>             | N/A                    |                         |         |                            |    |        |             |
| Writer's Guide <input type="checkbox"/>         | N/A                    |                         |         |                            |    |        |             |

**G** Safety Evaluation/Environmental Review Attached? ☐ Yes ☐ No

**H** ☐ SQR Program Final Review and Approval

Approval ☒ Disapproval ☐

*JA Jorinscay Jr.* 3/21/99  
 SQR Qualified Independent Reviewer

*Samuel Smith for Rick Bonner*  
 Department Head/Responsible Individual  
 03/21/99  
 Approval Date

☐ SORC/PORC/RI/DH Final Review and Approval

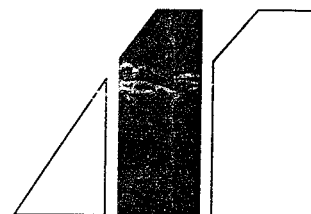
Department Head/Responsible Individual

Approval Signature

Approval Date and Meeting No.

**I** Effective Date 03/21/99

MILLSTONE NUCLEAR POWER STATION  
SURVEILLANCE PROCEDURE



**Forcing Pressurizer Sprays for Boron  
Equalization and  
Pressurizer Heater Capacity Test**

SP 2654B

Rev. 2

**S**TOP

**T**HINK

**A**CT

**R**EVIEW

Approval:

PORC Mtg. No:

N/A

Date:

10-20-98

Effective Date:

10-20-98

Level of Use  
**C**ontinuous

Subject Matter Expert:  
E.R Seacor

Millstone Unit 2  
Surveillance Procedure

**Forcing Pressurizer Sprays for Boron Equalization and  
Pressurizer Heater Capacity Test**

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ATTACHMENTS AND FORMS

OPS Form 2654B-1, "Forcing Pressurizer Sprays for Boron Equalization"

OPS Form 2654B-2, "Pressurizer Heaters Capacity Test"

Level of Use  
**C**ontinuous

STOP

THINK

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SP 2654B  
Rev. 2CHG1  
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## 1. PURPOSE

### 1.1 Objective

- 1.1.1 To provide instruction on forcing pressurizer sprays to equalize boron concentration between the pressurizer and Reactor Coolant System.
- 1.1.2 To provide instructions on measuring the capacity of the two groups of pressurizer proportional heaters that are supplied by emergency power to ensure that they meet the minimum capacity of 130 kW once per 92 days.

### 1.2 Discussion

Forcing pressurizer spray ensures the pressurizer and Reactor Coolant System boron concentrations are maintained in close proximity. This minimizes the possibility of power excursions resulting from pressurizer volume outflux following extended periods of steady state operation or evolutions which cause large changes in Reactor Coolant System boron concentration.

### 1.3 Applicability

OPS Form 2654B-1 is to be performed whenever the Reactor Coolant System is at normal operating temperature and pressure and a bubble is established in the pressurizer. ①

OPS Form 2654B-2 is required to be performed prior to entry into MODE 3, if *not* performed within the previous 92 days, and at least once per 92 days whenever the Reactor Coolant System is at normal operating temperature and pressure. ①

### 1.4 Frequency

- 1.4.1 OPS Form 2654B-1, "Forcing Pressurizer Sprays for Boron Equalization," is required to be performed at least once every week.
- 1.4.2 OPS Form 2654B-2, "Pressurizer Heater Capacity Test," is required to be performed at least once per 92 days.

Level of Use  
**C**ontinuous

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## 2. PREREQUISITES

### 2.1 General

- 2.1.1 The SM/US has reviewed plant conditions and authorized the performance of this test on OPS Form 2654B-1, "Forcing Pressurizer Sprays for Boron Equalization," or OPS Form 2654B-2, "Pressurizer Heater Capacity Test," as applicable.

### 2.2 Documents

- 2.2.1 OP 2304A, "Volume Control Portion of the Chemical and Volume Control System."
- 2.2.2 OP 2304E, "Charging Pumps."

## 3. PRECAUTIONS

- 3.1 Forcing pressurizer sprays raises the rate in which the Reactor Coolant System is degasified. The pressurizer steam space must be aligned to vent off any accumulation of non-condensable gases.
- 3.2 During power operation, changes in reactor power may result from forcing sprays or alternating charging pumps.
- 3.3 Performance of section 4.2 is time sensitive. With the pressurizer pressure controller in manual, there is the potential to drive pressure up and the spray valves will *not* respond.

Level of Use  
**C**ontinuous

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#### 4. INSTRUCTIONS

##### 4.1 Forcing Pressurizer Sprays

\_\_\_\_\_ 4.1.1 Refer To OP 2304A, "Volume Control Portion of the Chemical and Volume Control System," and ENSURE pressurizer steam space aligned to vent.

\_\_\_\_\_ 4.1.2 RECORD initial data on OPS Form 2654B-1 as follows:

\_\_\_\_\_ a. INDICATE selected pressurizer pressure controller (C-03):

- \_\_\_\_\_
- "PRES CNTL-X, PIC-100X"
  - "PRES CNTL-Y, PIC-100Y"

\_\_\_\_\_ b. INDICATE and RECORD *one* of the following from selected pressure controller:

- \_\_\_\_\_
- Controller setpoint (black and white arrow)
  - Controller output signal

\_\_\_\_\_ c. RECORD pressurizer pressure (PPC or C-03).

\_\_\_\_\_ 4.1.3 PLACE the following available pressurizer "BACKUP HTR" groups handswitch to "CLOSE" (C-03):

- \_\_\_\_\_
- "GROUP 1"
  - "GROUP 2"
  - "GROUP 3"
  - "GROUP 4"

\_\_\_\_\_ 4.1.4 PERFORM the following from selected pressure controller ("PRES CNTL-X, PIC-100X" or "PRES CNTL-Y, PIC-100Y") (C-03):

\_\_\_\_\_ a. Slowly LOWER selected pressure controller setpoint to obtain *both* of the following:

- \_\_\_\_\_
- Pressurizer controller output signal approximately 50%
  - "PZR SPRAY-1A, HIC-100E" and "PZR SPRAY-1B, HIC-100F" controller output signals start to rise

Level of Use  
**C**ontinuous

STOP

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b. ADJUST selected pressure controller setpoint during pressurizer heaters heatup and MAINTAIN pressurizer pressure at value recorded in step 4.1.2.c.:

- "PRES CNTL-X, PIC-100X"
- "PRES CNTL-Y, PIC-100Y"

4.1.5 RECORD start date and time on OPS Form 2654B-1.

4.1.6 WHEN pressurizer spray has been forced for at least 4 hours, RETURN pressurizer pressure control to normal as follows:

a. PLACE the following energized pressurizer "BACKUP HTR" groups handswitch to "TRIP" (C-03):

- "GROUP 1"
- "GROUP 2"
- "GROUP 3"
- "GROUP 4"

b. RAISE selected controller setpoint to obtain value recorded in step 4.1.2.b.:

- "PRES CNTL-X, PIC-100X"
- "PRES CNTL-Y, PIC-100Y"

4.1.7 RECORD stop date and time on OPS Form 2654B-1.

4.1.8 ADJUST selected pressure controller setpoint during pressurizer heaters cooldown and MAINTAIN pressurizer pressure at value recorded in step 4.1.2.c.:

- "PRES CNTL-X, PIC-100X"
- "PRES CNTL-Y, PIC-100Y"

4.1.9 Refer To OP 2304E, "Charging Pumps," and PERFORM applicable steps necessary to operate each available charging pump for at least 5 minutes (equalizes boron concentration).

4.1.10 WHEN each available charging pump has been operated for at least 5 minutes, INITIAL completion on OPS Form 2654B-1.

Level of Use  
Continuous

STOP

THINK

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\_\_\_\_\_ 4.1.11 IF this section has been completed satisfactorily, SIGN for completion of forcing pressurizer sprays on OPS Form 2654B-1.

\_\_\_\_\_ 4.1.12 IF desired, Go To Section 4.2 and PERFORM Pressurizer Heater Capacity Test. |

– End of Section 4.1 –

Level of Use  
**C**ontinuous

STOP

THINK

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## 4.2 Pressurizer Heaters Capacity Test



### CAUTION



The performance of this evolution is time sensitive. In manual, there is the potential to drive pressure up and the spray valves will *not* respond.

### NOTE

The following alarms may annunciate during this test as RCS pressure rises:

- PPC P100 alarms on high Pzr pressure control signal
- "PZR PRESSURE SELECTED CHANNEL DEVIATION HI/LO," C02/3-D37, alarms if Pzr pressure rises to 25 psi above the selected channel automatic setpoint
- PPC P100X or P100Y alarms if Pzr pressure reaches 2,300 psia

\_\_\_\_\_ 4.2.1 IF any unexpected plant responses occur during performance of this section, **PLACE** pressure controller ("PRES CNTL-X, PIC-100X" or "PRES CNTL-Y, PIC-100Y") (C-03) in AUTO, and **STABILIZE** the plant.

\_\_\_\_\_ 4.2.2 **ENSURE** selected channel PPC pressure, P100X or P100Y, in scan AND high alarm set for 2,300 psia.

\_\_\_\_\_ 4.2.3 IF any of the following alarms annunciate, Go To step 4.2.6:

- PPC point for selected channel pressurizer pressure, P100X or P100Y
- C02/3 - D38 "PRESSURIZER CH X PRESSURE HI/LO"
- C02/3 - D39 "PRESSURIZER CH Y PRESSURE HI/LO"

\_\_\_\_\_ 4.2.4 **PERFORM** the following from selected pressure controller ("PRES CNTL-X, PIC-100X" or "PRES CNTL-Y, PIC-100Y") (C-03):

- \_\_\_\_\_ a. **PLACE** selected pressure controller in "MAN."
- \_\_\_\_\_ b. Using manual adjustment lever, **REDUCE** selected pressure controller output signal to minimum (0%).

Level of Use  
**Continuous**

STOP

THINK

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4.2.5 DETERMINE proportional heater current by performing the following (C-03):

- Using Group 1 "AMP SEL SW," RECORD each position's current from "GROUP 1 HTR AMPS" on OPS Form 2654B-2 and RETURN switch to "OFF."
- Using Group 2 "AMP SEL SW," RECORD each position's current from "GROUP 2 HTR AMPS" on OPS Form 2654B-2 and RETURN switch to "OFF."

4.2.6 PLACE selected pressurizer controller in AUTO, ("PRES CNTL-X, PIC-100X" or "PRES CNTL-Y, PIC-100Y") (C-03).

4.2.7 ENSURE pressurizer pressure returns and stabilizes at selected pressure setpoint.

4.2.8 RECORD bus voltage from 22E and 22F (C-08) on OPS Form 2654B-2.

4.2.9 CALCULATE Group 1 and Group 2 average currents ( $I_{avg}$ ) from step 4.2.5 readings as follows and RECORD on OPS Form 2654B-2:

$$(\text{Pos 1} + \text{Pos 2} + \text{Pos 3}) \div 3 = I_{avg}$$

4.2.10 CALCULATE Group 1 and Group 2 total kW as follows and RECORD on OPS Form 2654B-2:

$$\frac{I_{avg} \times \text{Volts (22E)} \times \sqrt{3} \text{ (or 1.732)}}{1000} = \text{kW (Group 1)}$$

$$\frac{I_{avg} \times \text{Volts (22F)} \times \sqrt{3} \text{ (or 1.732)}}{1000} = \text{kW (Group 2)}$$

4.2.11 IF power is greater than or equal to 130 kW for each group, MARK and INITIAL OPS Form 2654B-2 "SAT."

— End of Section 4.2 —

Level of Use  
Continuous

STOP

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5. REVIEW AND SIGNOFF

- 5.1 Review and signoff for this procedure is accomplished on OPS Form 2654B-1, "Forcing Pressurizer Sprays for Boron Equalization," and OPS Form 2654B-2, "Pressurizer Heater Capacity Test."

6. REFERENCES

- 6.1 Technical Evaluation M2-EV-98-0123, "Requirements and Methodology for Verifying Pressurizer Heater Technical Specification Minimum Capacity."

7. SUMMARY OF CHANGES

- 7.1 Added section 4.2, OPS Form 2654B-2, "Pressurizer Heater Capacity Test," and renumbered existing steps to accommodate new section.
- 7.2 Added steps 1.1.2, 1.4.2, 3.3 and 6.1.

Level of Use  
**C**ontinuous

STOP

THINK

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REVIEW

SP 2654B

Rev. 2CHG1

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## JOB PERFORMANCE MEASURE APPROVAL SHEET

I. JPM Title: **Securing Emergency Boration**

ID Number: JPM-201

Revision: 1

II. Initiated:

  
Developer

2/23/01  
Date

III. Reviewed:


  
Technical Reviewer

2/23/01  
Date

IV. Approved:

  
User Department Supervisor

2/23/01  
Date

  
Nuclear Training Supervisor

2/26/01  
Date

## JOB PERFORMANCE MEASURE WORKSHEET

Facility: MP-2                      Examinee: \_\_\_\_\_

JPM Number: JPM-201                      Rev. 1

Task Title: **Securing Emergency Boration**

System: CVCS

Time Critical Task: Yes \_\_\_\_\_ No X

Validated Time (minutes): 5

Task No.(s): NUTIMS# 000-04-099

Applicable To:              SRO X              RO X              PEO \_\_\_\_\_

K/A No.: 004-A4.18              K/A Rating: 4.3./4.1

K/A No.: 024-AA1.17              K/A Rating: 3.9./3.9

K/A No.: 024-AA1.22              K/A Rating: 3.2./3.2

Method of Testing:

Simulated Performance: \_\_\_\_\_              Actual Performance: X

Location:

Classroom: \_\_\_\_\_              Simulator: X              In-Plant: \_\_\_\_\_

Task Standards:              At the completion of this JPM, the examinee has Secured  
Emergency Boration as specified in EOP 2541 Appendix 3.

Required Materials              • EOP 2541 Appendix 3  
(procedures,equipment):

General References:              EOP 2541 Appendix 3

**\*\*\*\*\* READ TO THE EXAMINEE \*\*\*\*\***

*I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.*

## JOB PERFORMANCE MEASURE WORKSHEET

JPM Number: JPM-201

Rev. 1

Initiating Cues:

- You are the PPO.
- The Unit Supervisor has directed you to Secure Emergency Boration in accordance with EOP 2541 Appendix 3, to allow leak isolation and spill cleanup

Initial Conditions:

- The plant experienced a spurious trip with 2 stuck rods.
- Emergency Boration has been in progress from the BAST
- The US has completed EOP 2525 and is now performing EOP 2526 Contingency Action 9.2 (SDM has been verified)
- A leak has developed just upstream of 2-CH-514 and is spraying contaminated water in the general area

Simulator Requirements:

Initialize at a normal post-trip IC and perform the following:

- Initialize in IC-24 (100% power)
- Enter Malfunction RD0203 RD0215, to cause 2 Rods to Stick out on a subsequent trip.
- Trip the plant and stabilize parameters.
- Emergency Borate per EOP 2541 Appendix 3
- Snap shot as necessary for additional exams

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\*\*\* NOTES TO EXAMINER \*\*\*

1. Critical steps for this JPM are indicated with an "X". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions / observations (i.e. "What are you looking at?" or "What are you observing?").

**PERFORMANCE INFORMATION**

JPM ID NUMBER: JPM-201

TITLE: Securing Emergency Boration

---

START TIME:                     

STEP 1      X Performance Steps: a.      Open CH-501, VCT outlet

GRADE       X Standards:      *Examinee opens CH-501, VCT outlet*

Cue:

Comments:

~~~~~

STEP 2 Performance Steps: a. Stop both boric acid pumps

GRADE Standards: *Examinee stops both boric acid pumps*

Cue:

Comments:

PERFORMANCE INFORMATION

JPM ID NUMBER: JPM-201 TITLE: Securing Emergency Boration

STEP 3 X Performance Steps: Close both boric acid gravity feed isolations

- CH-508
- CH-509

GRADE X Standards: *Examinee closes both boric acid gravity feed isolations*

Cue:

Comments:

~~~~~

STEP 4          Performance Steps: Close CH-514, boric acid isolation

GRADE            Standards:    *Examinee closes Close CH-514, boric acid isolation*

Cue:

Comments:

~~~~~

STEP 5 Performance Steps: Check charging flow is stable.

GRADE Standards: *Examinee observes charging flow meter*

Cue:

Comments:

PERFORMANCE INFORMATION

JPM ID NUMBER: JPM-201 TITLE: Securing Emergency Boration

STEP 6 __ Performance Steps: Open both boric acid pump recirc valves

- CH-510
- CH-511

GRADE __ Standards: *Examinee opens both boric acid pump recirc valves*

Cue:

Comments:

~~~~~

STEP 6      \_\_ Performance Steps: If CH-500, letdown divert handswitch is in the 'RWS' position, place the valve to the 'VCT' position.

GRADE \_\_      Standards:      *Examinee leaves CH-500 letdown divert handswitch in the 'AUTO' position.*

Cue:

Comments:

~~~~~

Comments: **After this step is completed, the JPM is considered complete.**

STOP TIME:

VERIFICATION OF JPM COMPLETION

Job Performance Measure No. JPM-201

Rev. 1

Date Performed: _____

Operator: _____

Evaluator(s): _____

For examinee to achieve a satisfactory grade, ALL critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No X

Validated Time (minutes): 5

Actual Time to Complete (minutes): _____

Result of JPM: _____ (Denote by an S for satisfactory or a U for unsatisfactory)

Areas for Improvement:

EXAMINEE HANDOUT

JPM ID Number: 201

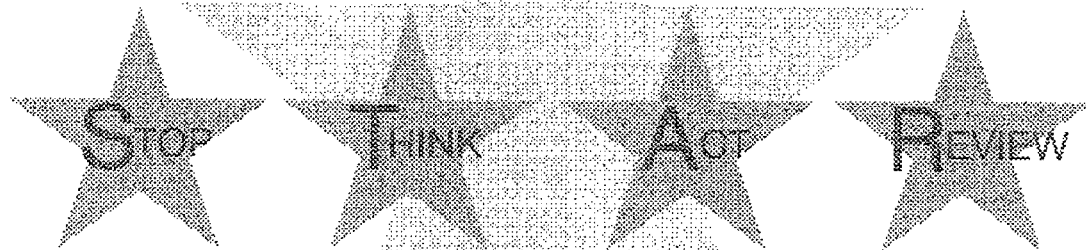
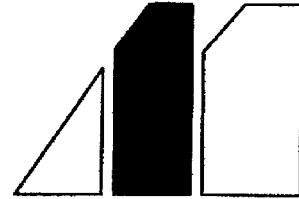
Initiating Cues:

- You are the PPO.
- The Unit Supervisor has directed you to Secure Emergency Boration in accordance with EOP 2541 Appendix 3, to allow leak isolation and spill cleanup

Initial Conditions:

- The plant experienced a spurious trip with 2 stuck rods.
- Emergency Boration has been in progress from the BAST
- The US has completed EOP 2525 and is now performing EOP 2526 Contingency Action 9.2 (SDM has been verified)
- A leak has developed just upstream of 2-CH-514 and is spraying contaminated water in the general area

**MILLSTONE NUCLEAR POWER STATION
EMERGENCY OPERATING PROCEDURE**



Standard Appendices

EOP 2541

Rev. 2

Approval Date: 1-8-01

Effective Date: 1-9-01

Level of Use
Continuous

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Appendix 3
Emergency Boration

INSTRUCTIONS

- ___1. **IF** emergency boration is desired,
PERFORM Attachment 3–A,
“Commencing Emergency
Boration.”
- ___2. **IF** securing emergency boration,
PERFORM Attachment 3–B,
“Securing Emergency Boration.”

CONTINGENCY ACTIONS



Attachment 3–A

**Commencing
Emergency Boration**

Page 1 of 4

INSTRUCTIONS

CONTINGENCY ACTIONS

- ___ 1. IF boric acid storage tanks are available,
INITIATE emergency boration as follows:
- a. ENSURE CH–512, VCT makeup valve stop is closed.
 - b. ENSURE CH–196, VCT makeup bypass is closed.
 - c. OPEN CH–514, boric acid isolation.
 - d. START **BOTH** boric acid pumps.
 - e. CLOSE **BOTH** boric acid pump recirc valves:
 - CH–510
 - CH–511
 - f. OPEN **BOTH** boric acid gravity feed isolations:
 - CH–508
 - CH–509
 - g. CLOSE CH–501, VCT outlet isolation.
 - h. IF CH–500, letdown divert handswitch is in the “VCT” position,
PLACE the valve to the “RWS” position.

(continue)

(continue)



Attachment 3–A

**Commencing
Emergency Boration**

Page 2 of 4

INSTRUCTIONS

CONTINGENCY ACTIONS

1. (continued)

i. ENSURE at least one charging pump is operating.

i.1 IF power to charging pump “B” has been lost AND the alternate power source is available, TRANSFER its power supply to the alternate source. Refer To Appendix 31, “Transferring Charging Pump “B” Power Supply.”

j. CHECK charging flow is greater than 40 gpm.

j.1 PERFORM ANY of the following to restore charging flow:

- 1) ENSURE electrical power to the charging pumps and valves.
- 2) ENSURE correct valve lineup.
- 3) START additional charging pumps as needed until charging flow is greater than 40 gpm.



**Millstone Unit 2
Standard Appendices**

EOP 2541

Revision 2

Page 15 of 430

Appendix 3

Page 4 of 7

Attachment 3–A

**Commencing
Emergency Boration**

Page 3 of 4

INSTRUCTIONS

CONTINGENCY ACTIONS

___ 2. IF the boric acid storage tanks are
not available,
INITIATE emergency boration from
the RWST as follows:

- a. OPEN CH–192, RWST
isolation.
- b. ENSURE CH–504, RWST to
charging suction is open.
- c. ENSURE CH–196, VCT
makeup bypass is closed.
- d. CLOSE CH–501, VCT outlet
isolation.
- e. IF CH–500, letdown divert
handswitch is in the “VCT”
position,
PLACE the valve to the
“RWS” position.
- f. ENSURE at least one charging
pump is operating.

- f.1 IF power to charging pump “B”
has been lost AND the alternate
power source is available,
TRANSFER its power supply to
the alternate source. Refer To
Appendix 31, “Transferring
Charging Pump “B” Power
Supply.”

(continue)

(continue)



Attachment 3–A

**Commencing
Emergency Boration**

Page 4 of 4

INSTRUCTIONS

CONTINGENCY ACTIONS

2. (continued)

- g. CHECK charging flow is greater than 40 gpm.

g.1 PERFORM ANY of the following to restore charging flow:

- 1) ENSURE electrical power to the charging pumps and valves.
- 2) ENSURE correct valve lineup.
- 3) START additional charging pumps as needed until charging flow is greater than 40 gpm.



Attachment 3–B

**Securing
Emergency Boration**

Page 1 of 2

INSTRUCTIONS

CONTINGENCY ACTIONS

- ___1. **IF** emergency boration has been initiated from the boric acid storage tanks,
SECURE emergency boration as follows:
- a. **ENSURE** the VCT is at normal operating level and pressure.
 - b. **OPEN** CH–501, VCT outlet isolation.
 - c. **STOP BOTH** boric acid pumps.
 - d. **CLOSE BOTH** boric acid gravity feed isolations:
 - CH–508
 - CH–509
 - e. **CLOSE** CH–514, boric acid isolation.
 - f. **CHECK** charging flow is stable.
 - g. **OPEN BOTH** boric acid pump recirc valves:
 - CH–510
 - CH–511
 - h. **IF** CH–500, letdown divert handswitch is in the “RWS” position,
PLACE the valve to the “VCT” position.



**Millstone Unit 2
Standard Appendices**

EOP 2541

Revision 2

Page 18 of 430

Appendix 3

Page 7 of 7

Attachment 3–B

**Securing
Emergency Boration**

Page 2 of 2

INSTRUCTIONS

CONTINGENCY ACTIONS

2. **IF** emergency boration has been initiated from the RWST, **SECURE** emergency boration as follows:
- a. **ENSURE** the VCT is at normal operating level and pressure.
 - b. **OPEN** CH–501, VCT outlet isolation.
 - c. **CLOSE** CH–192, RWST isolation.
 - d. **IF** CH–500, letdown divert handswitch is in the “RWS” position, **PLACE** the valve to the “VCT” position.

– End of Appendix 3 –



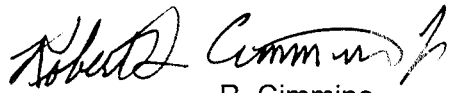
JOB PERFORMANCE MEASURE APPROVAL SHEET

I JPM Title: Energize Bus 24C From 24E

ID Number: JPM-049Alt

Revision: 5

II. Initiated:



R. Cimmino
Developer

2/23/01

Date

III. Reviewed:



R. Spurr
Technical Reviewer

2/23/01

Date

IV. Approved:



User Department Supervisor

2/23/01

Date



M. C. Jensen
Nuclear Training Supervisor

2/26/01

Date

JOB PERFORMANCE MEASURE WORKSHEET

Facility: MP-2 Examinee: _____

JPM Number: JPM-049Alt Rev. 5

Task Title: Energize Bus 24C From 24E

System: 4,160 Volt AC

Time Critical Task: Yes _____ No X

Validated Time (minutes): 15

Task No.(s): NUTIMS #062-025-01-01

Applicable To: SRO X RO X PEO _____

K/A No. 062-000-A4.01 K/A Rating 3.3/3.1

Method of Testing:

Simulated Performance: _____ Actual Performance: X

Location:

Classroom: _____ Simulator: X In-Plant: _____

Task Standards: At the completion of this JPM, the examinee has energized Bus 24C from Unit 3 per OP 2343.

Required Materials OP 2343
(procedures,
equipment):

General References: OP 2343

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

JOB PERFORMANCE MEASURE WORKSHEET

PM Number: JPM-049

Rev. 5

Initiating Cues:

- You are the SPO.
- The Unit Supervisor has directed you to energize Bus 24C from 24E.
- Inform the Unit Supervisor when ready to energize loads on 24C.

Initial Conditions:

- The plant is shutdown and in mode 3.
- Bus 24C de-energized due to a malfunction on breaker A302.
- "A" DG is out for PM's.
- There are no faults on bus 24C.
- 24E is presently powered from Unit 3
- Unit 3 has given permission to energize and load Bus 24C via 34A/B
- There are no unusual loading restrictions on 34A/B.

Simulator Requirements:

Initialize at an IC in a post-trip configuration and enter the following:

- "A" DG OOS w/ air starts closed (EGR12) and outout breaker racked out (EGR17).
- Reset "A" DG trouble alarm (EGR16) and Freeze.
- Place yellow tag on "A" DG breaker switch (A312) on C-08.
- Open breaker A302 (RSST to Bus 24C)
- Close breaker A505 to power 24E from Unit 3.

When examinee is ready, place simulator to Run.

***** NOTES TO EXAMINER *****

1. Critical steps for this JPM are indicated with an "X". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions / observations (i.e. "What are you looking at?" or "What are you observing?").

PERFORMANCE INFORMATION

PM ID NUMBER: JPM-049

TITLE: Energize Bus 24C From 24E

START TIME: _____

STEP 1 _____ Performance Steps: Ensure the following breakers are open:

- DG A FDR BKR, 15G-12U-2 (A312)
- RSS SPLY BKR, 22S3-24C-2 (A302)
- 24A/24C TIE BKR, 24C-1T-2 (A304)
- 24D/24E TIE BKR, 24D-2T-2 (A408)

GRADE _____ Standards: *Examinee opens or verifies open the breakers and no auto start signals present.*

Cue:

Comments:

~~~~~

STEP 2    \_\_\_\_\_ Performance Steps:    Ensure "24C/24E TIE BKR, 24C-2T-2 (A305)," is open  
AND racked up.

GRADE    \_\_\_\_\_ Standards:    *Examinee verifies A305 open and racked up by observing its green light only is lit.*

Cue:

Comments:

~~~~~

STEP 3 _____ Performance Steps: Ensure bus 24E is energized.

GRADE _____ Standards: *Examinee observes voltage indication on Bus 24E voltmeter.*

Cue:

Comments:

~~~~~

### PERFORMANCE INFORMATION

PM ID NUMBER: JPM-049

TITLE: Energize Bus 24C From 24E

---

STEP 4      Performance Steps:      Notify Unit 3 Control Room that they will be supplying Unit 2 bus 24C.

GRADE      Standards:      *Examinee either calls Unit 3 control room or recommends that the US/SM call*

Cue:      Unit 3 has been notified

Comments:

~~~~~

STEP 5 Performance Steps: IF this section is not being performed to support an EOP, ensure A303, "24C/22E FDR BKR," is open.

GRADE Standards: *Examinee determines by querying the US or reviewing the initial conditions that this evolution is not used in conjunction with the EOPs and opens the breaker.*

Cue:

Comments: There is an interlock that will automatically trip B0502 if A303 is opened first.

~~~~~

STEP 6      Performance Steps:      Ensure the following load breakers on bus 24C are open:

- A306 "Service Water Pump A"
- A307 "AFW Pump A"
- A308 "HPSI Pump A"
- A 309 "LPSI Pump A"
- A310 "Containment Spray Pump A"
- A311 "RBCCW Pump A"

GRADE      Standards:      *Examinee opens or checks open the load breakers.*

Cue:

Comments:

## PERFORMANCE INFORMATION

PM ID NUMBER: JPM-049

TITLE: Energize Bus 24C From 24E

---

~~~~~

STEP 7 Performance Steps: Obtain bypass keys for ESAS bus 24C undervoltage from OPS key locker.

GRADE Standards: *Examinee obtains 4 keys for bypassing ESAS bus 24C from OPS key locker.*

Cue:

Comments:

~~~~~

STEP 8    X Performance Steps:    Insert bypass keys into 4 ESAS channels "UV BUS A3" and rotate to "INHIBIT" position.

GRADE         X Standards:    *Examinee places each of the 4 bypass keys into the "UV Bus A3" keyholes for each channel of ESAS, and turns each to "INHIBIT".*

Cue:

Comments:

~~~~~

STEP 9 X Performance Steps: To reset bus 24C undervoltage actuation, PRESS reset button "UV" on ESAS Actuation Cabinet 5.

GRADE X Standards: *Examinee pushes the "UV" button on ESAS Actuation Cabinet 5.*

Cue:

Comments: The examinee may use the resetting of annunciator C-33 on C-01 (ESAS UV CH 1 TRIP), as verification that undervoltage has reset.

~~~~~

## PERFORMANCE INFORMATION

PM ID NUMBER: JPM-049

TITLE: Energize Bus 24C From 24E

---

STEP 10    Performance Steps:    Check sequence 0 light not lit AND sequence 1,2,3 and 4 are lit.

GRADE    Standards:    *Examinee observes sequence 0 not lit and others lit.*

Cue:

Comments:

~~~~~

STEP 11 X Performance Steps: Close "24C/24E TIE BKR, 24C-1T-2 (A305)," and observe bus 24C voltmeter increase.

GRADE X Standards: *Examinee reads caution above step 4.12.11 and determines that the sequence 0 light is **not** lit and then continues on to step 4.12.12 and places the 24C to 24E tie bkr control switch to "close" and observes closure and volt indication for bus 24C.*

Cue:

Comments:

~~~~~

STEP 12    Performance Steps:    Reset ESAS bus 24C undervoltage sensor trips on all 4 ESAS channels.

GRADE    Standards:    *Examinee pushes red lights for UV on bus24C on all 4 sensor cabinets.*

Cue:

Comments:

**After this step is completed, the JPM is considered complete.**

STOP TIME: \_\_\_\_\_

### VERIFICATION OF JPM COMPLETION

Job Performance Measure No. JPM-049

Rev. 5

Date Performed: \_\_\_\_\_

Operator: \_\_\_\_\_

Evaluator(s): \_\_\_\_\_

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.  
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes \_\_\_\_\_ No X

Validated Time (minutes): \_\_\_\_\_ 15

Actual Time to Complete (minutes): \_\_\_\_\_

Result of JPM: \_\_\_\_\_ (Denote by an S for satisfactory or a U for unsatisfactory)

Areas for Improvement:

## EXAMINEE HANDOUT

JPM ID Number: 049

### Initiating Cues:

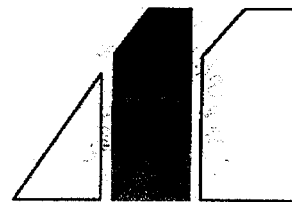
- You are the SPO.
- The Unit Supervisor has directed you to energize Bus 24C from 24E.
- Inform the Unit Supervisor when ready to energize loads on 24C.

### Initial Conditions:

- The plant is shutdown and in mode 3.
- Bus 24C de-energized due to a malfunction on breaker A302.
- "A" DG is out for PM's.
- There are no faults on bus 24C.
- 24E is presently powered from Unit 3
- Unit 3 has given permission to energize and load Bus 24C via 34A/B
- There are no unusual loading restrictions on 34A/B.



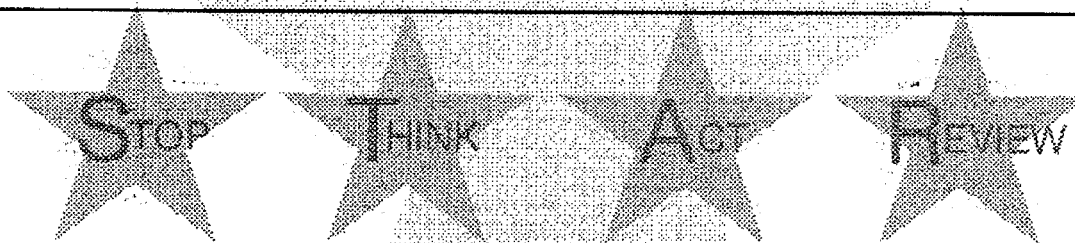
**MILLSTONE NUCLEAR POWER STATION  
SYSTEM OPERATING PROCEDURE**



**4160 Volt Electrical System**

**OP 2343**

**Rev. 019-00**



Approval Date: 1-8-01

Effective Date: 1-9-01

Level of Use  
**General**

**Millstone Unit 2  
System Operating Procedure**

**4160 Volt Electrical System**

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**Level of Use**  
**General**



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Level of Use  
General



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## 1. PURPOSE

### 1.1 Objective

This procedure provides instructions for the startup, shutdown, normal and casualty operation of the 4,160 Volt Electrical System.

### 1.2 Discussion

During periods such as startup and shutdown, when NSST is *not* available, power is supplied from RSST bus 24G to buses 24C and 24D. Bus ties to 24A and 24B supply power to those buses. Bus 24E may be fed from either 24C or 24D. A separate feed is provided to bus 24E from the Unit 3 RSST or NSST through bus 34A or 34B. |

Level of Use  
**General**



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During normal at power operation, expected plant conditions are as follows:

- NSST, 15G-2S, is in service.
- The following breakers are closed:
  - "NSS SPLY BKR, 2S3-24A-2 (A102)"
  - "NSS SPLY BKR, 2S3-24B-2 (A206)"
  - "24A/24C TIE BKR, 24C-1T-2 (A304)"
  - "24B/24D TIE BKR, 24D-1T-2 (A410)"
  - "24C/24E TIE BKR, 24C-2T-2 (A305)"
  - "RSS FDR BKR 24C/24D, CS2/22S3-2-2 (A702)"
- RSST, 15G-22S, is energized.
- "RSS SPLY BKR, 22S3-24C-2 (A302)," and "RSS SPLY BKR, 22S3-24D-2 (A411)," are open.
- 4,160 volt buses 24A, 24B, 24C, 24D, 24E, 24G, and 34A or 34B, are in service.
- Bus 24E is normally energized and connected to bus 24C through "24C/24E TIE BKR, 24C-2T-2 (A305)." Electrical and mechanical key interlocks prevent connecting bus 24E to both buses 24C and 24D, simultaneously.
- "24E/34B TIE BKR, 34B-24E-2 (A505)," from bus 34 A or 34B to bus 24E is open.
- "DG A FDR BKR, 15G-12U-2 (A312)," is open.
- "DG B FDR BKR, 15G-13U-2 (A401)," is open.
- 125 VDC control power is in service.

Level of Use  
**General**



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During shutdowns, expected plant conditions are as follows:

- RSST, 15G-22S, is in service.
- The following breakers are closed:
  - "RSS FDR BKR 24C/24D, CS2/22S3-2-2 (A702)"
  - "RSS SPLY BKR, 22S3-24C-2 (A302)"
  - "RSS SPLY BKR, 22S3-24D-2 (A411)"
  - "24C/24E TIE BKR, 24C-2T-2 (A305)"
  - "24A/24C TIE BKR, 24C-1T-2 (A304)"
  - "24B/24D TIE BKR, 24D-1T-2 (A410)"
- "NSS SPLY BKR, 2S3-24A-2 (A102)," and "NSS SPLY BKR, 2S3-24B-2 (A206)," are open.
- 4,160 volt buses 24A, 24B, 24C, 24D, 24E, 24G, and 34A or 34B, are in service.
- "24E/34B TIE BKR, 34B-24E-2 (A505)," from bus 34 A or 34B to bus 24E is open.
- "DG A FDR BKR, 15G-12U-2 (A312)," is open.
- "DG B FDR BKR, 15G-13U-2 (A401)," is open.
- 125 VDC control power is in service.

## 2. PREREQUISITES

### 2.1 General

- 2.1.1 125 VDC control power in service.
- 2.1.2 Reserve station service transformer, 15G-22S, is available.
- 2.1.3 Emergency diesel generators are available.
- 2.1.4 Prior to energizing a dead 4,160 volt bus, all breakers on the bus are open.

Level of Use  
**General**



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2.1.5 Fire Detection System is available and in service.

## 2.2 Documents

2.2.1 OP 2325A, "Circulating Water System"

2.2.2 OP 2330A, "RBCCW System"

2.2.3 OP 2344A, "480 Volt Load Centers"

2.2.4 OP 2346A, "Emergency Diesel Generators"

2.2.5 OP 2347D, "Backfeeding Unit 2"

2.2.6 OP 2348A, "6,900 and 4,160 Volt Breaker Operation"

2.2.7 OP 2384, "ESAS Operation"

2.2.8 EOP 2525, "Standard Post Trip Actions"

2.2.9 EOP 2528, "Electrical Emergency"

2.2.10 ARP 2590F, "Alarm Response for Control Room Panel, C-08"

2.2.11 OPS Form 2604E-002, "High Pressure Safety Injection System Valve Alignment, Facility 1"

2.2.12 OPS Form 2604F-002, "HPSI System Valve Check, Facility 2"

2.2.13 OPS Form 2611C-002, "RBCCW System Alignment Checks, Facility 1"

2.2.14 OPS Form 2611D-002, "RBCCW System Alignment Checks, Facility 2"

2.2.15 2314H-002, "C" ESF Room Air Recirculation System Damper Alignment"

2.2.16 NUSCo Drawings:

- 25203-30001, 30004, 30005, 30007, 30008, and 30009
- 25203-30011, Sheets 0 through 42G

Level of Use  
**General**



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### 3. PRECAUTIONS

- 3.1 Because there are *no* synchronizing check circuits, "RSS FDR BKR, 24C/24D, CS2/22S3-2-2 (A702)" shall *not* be used for paralleling operations.
- 3.2 When restoring RSST to service on the emergency buses 24C or 24D following a LNP, undervoltage relays on the ESAS actuation cabinets for the respective emergency bus must *not* be reset until immediately prior to energizing bus from the RSST. This prevents simultaneous starting of all facility related safeguard equipment in the event of a SIAS actuation, while operating on diesel generator only.
- 3.3 Prior to energizing equipment, Switching and Safety Tag Logs must be reviewed to ensure clearance of all tags on equipment to be energized.
- 3.4 Synchronizing switch should be in "OFF" when *not* in use.
- 3.5 Potential transformers must be grounded prior to fuse installation or removal.
- 3.6 Circuit breakers required to be isolated must have control power disconnected and breaker racked out *and* tagged.
- 3.7 When taking the plant off-line, the 4,160 volt buses must be manually transferred from the NSST to the RSST at equal to or greater than 10% turbine load (90 MWe).
- 3.8 Before energizing any bus after maintenance, a visual inspection must be made to ensure the following:
  - All portable grounds have been removed.
  - Bus compartment panels have been replaced.
  - All breakers on the bus are open.
  - All foreign objects are removed from in and around breaker compartments.
  - All protective relay targets and lockout relays are reset.
  - Potential transformer compartments are in the operating position (inserted) and secondary fuses are installed and "ON."
  - Fuses are installed and all compartment doors are closed.

Level of Use  
**General**



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#### 4.12 Energizing Bus 24C from Bus 24E



\_\_\_\_\_ 4.12.1 ENSURE the following breakers are open:

- \_\_\_\_\_ • “DG A FDR BKR, 15G–12U–2 (A312)”
- \_\_\_\_\_ • “RSS SPLY BKR, 22S3–24C–2 (A302)”
- \_\_\_\_\_ • “24A/24C TIE BKR, 24C–1T–2 (A304)”
- \_\_\_\_\_ • “24D/24E TIE BKR, 24D–2T–2 (A408)”

\_\_\_\_\_ 4.12.2 ENSURE “24C/24E TIE BKR, 24C–2T–2 (A305),” is open  
AND racked up.

\_\_\_\_\_ 4.12.3 ENSURE bus 24E is energized.

\_\_\_\_\_ 4.12.4 NOTIFY Unit 3 Control Room that they will be supplying Unit 2 |  
bus 24C.

\_\_\_\_\_ 4.12.5 IF this section is *not* being performed to support an EOP,  
ENSURE A303, “24C/22E FDR BKR”, is open.

#### NOTE

Applicable hand switches will be used to open breakers if needed to  
override ESF actuated equipment.

\_\_\_\_\_ 4.12.6 ENSURE the following load breakers on bus 24C are open:

- \_\_\_\_\_ • A306, “SERVICE WATER PUMP A”
- \_\_\_\_\_ • A307, “AFW PUMP A”
- \_\_\_\_\_ • A308, “HPSI PUMP A”
- \_\_\_\_\_ • A309, “LPSI PUMP A”
- \_\_\_\_\_ • A310, “CONTAINMENT SPRAY PUMP A”
- \_\_\_\_\_ • A311, “RBCCW PUMP A”

Level of Use  
**General**



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- \_\_\_\_\_ 4.12.7 OBTAIN bypass keys (4) for ESAS bus 24C undervoltage from Operations Department key locker.
- \_\_\_\_\_ 4.12.8 INSERT bypass keys into 4 ESAS undervoltage channels "UV BUS A3," and ROTATE to "INHIBIT" position.
- \_\_\_\_\_ 4.12.9 To reset bus 24C undervoltage actuation, PRESS reset button "UV" on ESAS actuation cabinet 5.
- \_\_\_\_\_ 4.12.10 CHECK sequence 0 light is *not* lit AND sequence 1, 2, 3, and 4 are lit.



### CAUTION



**IF** a load shed signal from Facility 1 ESAS sequencer is active (sequence 0 light is lit), *unless* the load shed signal is removed, breaker A505 will open when "24C/24E TIE BKR, 24C-2T-2 (A305)", is closed.

- \_\_\_\_\_ 4.12.11 **IF** sequence 0 light *is* lit, **PERFORM** the following:
- PRESS both emergency trip push buttons on C-08 simultaneously and **ENSURE** DG is tripped.
  - CHECK "DG DISABLED" alarm is annunciated.
  - RESET DG sequencer using the reset key on the sequencer module.
- \_\_\_\_\_ 4.12.12 CLOSE "24C/24E TIE BKR, 24C-2T-2 (A305)," and OBSERVE bus 24C voltmeter increase.
- \_\_\_\_\_ 4.12.13 RESET ESAS bus 24C undervoltage sensor trips on all 4 ESAS channels.
- \_\_\_\_\_ 4.12.14 **IF** ESAS undervoltage sensor trips reset, ROTATE "UV BUS A3" bypass keys to "OPER," and REMOVE keys.

Level of Use  
**General**



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### NOTE

Until power is restored to 480 VAC Bus 22E and its associated MCCs, some support components such as valves and controllers will not be available. It may be desirable to restore power to 480 VAC Bus 22E before starting the pumps.

4.12.15 IF 480 VAC Bus 22E is *not* energized and is desired to provide support equipment prior to starting pumps, PERFORM the following:

- ENSURE B0502, "22E SPLY BKR", is open.
- ENSURE A303, "24C/22E FDR BKR" is closed.
- CLOSE B0502, "22E SPLY BKR".
- CHECK voltage indicated on 480 VAC Bus 22E.

Level of Use  
**General**



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## CAUTION



1. Load limits on Unit 3, as specified in Attachment 2, "Load Limits from Unit 3," and current vs voltage limits of Attachment 1, "3 MVA Electrical Limit on Unit 3 4160 Volt Cross Tie should *not* be exceeded.
2. Additionally, due to cable tray heating limitations, the bus 24C/24E cables have been de-rated to 300 amps maximum. To ensure that 3 MVA can be transferred from Unit 3 without overheating the bus 24D/24E cables, the "B" SW and RBCCW pumps must be run.

\_\_\_\_\_ 4.12.16 As directed by the SM/US:

- CLOSE the following load breakers (C-08):
  - A307, "AFW PUMP A"
  - A308, "HPSI PUMP A"
  - A309, "LPSI PUMP A"
  - A310, "CONTAINMENT SPRAY PUMP A"
  - A502, "SERVICE WATER PUMP B"
- Refer to OP 2330A, "RBCCW System," and RESTORE RBCCW flow using A504 "RBCCW PUMP B."

\_\_\_\_\_ 4.12.17 MONITOR current draw (C-08).

\_\_\_\_\_ 4.12.18 OBSERVE the following limitations:

- Refer To Attachment 1, "3 MVA Electrical Limit on Unit 3 4160 Volt Cross Tie," and Attachment 2, "Load Limits from Unit 3 and ENSURE load limit is *not* exceeded.
- ENSURE bus 24C/24E current less than or equal to 300 amps.

Level of Use  
**General**



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\_\_\_\_\_ 4.12.19 IF 480 VAC Bus 22E is *not* energized, **PERFORM** the following:

- ENSURE B0502, "22E SPLY BKR", is open.
- ENSURE A303, "24C/22E FDR BKR" is closed.
- CLOSE B0502, "22E SPLY BKR".
- CHECK voltage indicated on 480 VAC Bus 22E.

\_\_\_\_\_ 4.12.20 RETURN bypass keys (4) to Operations Department key locker.

– End of Section 4.12 –

Level of Use  
**General**



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## JOB PERFORMANCE MEASURE APPROVAL SHEET

I JPM Title: Local Manual Operation of the "A" Atmospheric Dump Valve

ID Number: JPM-207

Revision: 0

II. Initiated:

  
Developer

2/23/01  
Date

III. Reviewed:


  
Technical Reviewer

2/23/01  
Date

IV. Approved:

  
User Department Supervisor

2/23/01  
Date

  
Nuclear Training Supervisor

2/26/01  
Date

## JOB PERFORMANCE MEASURE WORKSHEET

Facility: MP-2

Examinee: \_\_\_\_\_

JPM Number: JPM-207

Rev. 0

Task Title: Local Manual Operation of the "A" Atmospheric Dump Valve

System: Main Steam

Time Critical Task: Yes \_\_\_\_\_ No X

Validated Time (minutes): 15

Task No.(s): 035-003-01-04 (NUTIMS# 035-01-029)

Applicable To: SRO X RO X PEC X

K/A No. 039-A2.04 K/A Rating 3.4/3.7

### Method of Testing:

Simulated Performance: X Actual Performance: \_\_\_\_\_

### Location:

Classroom: \_\_\_\_\_ Simulator: \_\_\_\_\_ In-Plant: X

Task Standards: Examinee has taken local manual control of the "A" ADV and placed in to 25% open per EOP 2541 APPENDIX 36.

Required Materials EOP 2541 APPENDIX 36  
(procedures,  
equipment):

General References: EOP 2541 APPENDIX 36

### **\*\*\*\*\* READ TO THE EXAMINEE \*\*\*\*\***

*I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.*

## JOB PERFORMANCE MEASURE WORKSHEET

### Initiating Cues:

- The US directs you to take local manual control of the "A" Atmospheric Dump Valve and open the valve to 25%.

### Initial Conditions:

- A loss of I.A. has occurred in the plant.
- The plant has tripped and the decision has been made to use the "A" Atmospheric Dump Valve to remove decay heat.

### Simulator Requirements:

N/A

---

### **\*\*\*\*\* NOTES TO EXAMINER \*\*\*\*\***

1. Critical steps for this JPM are indicated with an "X". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions / observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the examinee be allowed to manipulate any devices during the performance of this JPM.



## PERFORMANCE INFORMATION

PM ID NUMBER: JPM-207

TITLE: Local Manual Operation of the "A" Atmospheric Dump Valve

START TIME: \_\_\_\_\_

STEP 1            Performance Steps:    Determine local ambient air temperatures for the applicable penetration rooms by reading local area thermometers.

GRADE                 Standards:    *Examinee reads the local temperature for by opening door to penetration room and peering at locally mounted thermometer.*

Cue:    State that the temperature gauge indicates 130°F.

Comments:    The operator may feel the door to the penetration room to determine if it is excessively hot. IF he does, indicate that the door seems about normal.

~~~~~

STEP 2 X Performance Steps: Notify EMTs of pending entry.

GRADE X Standards: *Examinee may call the control room and request additional operators and that they notify the EMTs. The expressed **need** to notify the EMTs is the only critical component of this step.*

Cue: State that you are the additional operator (if requested) but for purpose of this JPM, the examinee is expected to do the assigned task and that the EMTs have been notified.

Comments:

~~~~~

STEP 3            Performance Steps:    Initiate use of ice vest and gloves.

GRADE                 Standards:    *Examinee goes to obtain ice vest and gloves.*

Cue:    After operator has recognized need for ice vest and gloves, indicate that the ice vest and gloves are considered as donned for the remainder of the task

Comments:

**PERFORMANCE INFORMATION**

PM ID NUMBER: JPM-207

TITLE: Local Manual Operation of the "A" Atmospheric Dump Valve

~~~~~

STEP 4 ___ Performance Steps: Establish communications between the Control Room and the Atmospheric Dump Valve, 2-MS-190A.

GRADE ___ Standards: *Examinee states that he would obtain a headset and extension, goes to the blowdown room (East 38'6";AB), plugs into maintenance jack on the stanchion next to the blowdown H.X. and gets in contact with the control room.*

Cue: Communications are established.

Comments:

STEP 5 ___ Performance Steps: Ensure ADV manual isolation valve, MS - 3A is open.

GRADE ___ Standards: *Examinee determines manual valve is open .*

Cue: Valve is open.

Comments:

~~~~~

## PERFORMANCE INFORMATION

PM ID NUMBER: JPM-207

TITLE: Local Manual Operation of the "A" Atmospheric Dump Valve

STEP 6         Performance Steps:    Remove the "Vent Valve" assembly from the instrument rack located below the ADV.

GRADE              Standards:    *Examinee removes the vent valve from the instrument rack below the ADV.*

Cue: Vent valve is removed.

Comments:

~~~~~

STEP 7 Performance Steps: Ensure the "Vent Valve" assembly is closed.

GRADE Standards: *Examinee Ensure the "Vent Valve" assembly is closed.*

Cue: Vent valve is closed.

Comments:

~~~~~

STEP 8    X Performance Steps:    Close the Instrument Air Isolation valve to the Atmospheric Dump Valve, 2-MS-190A.

GRADE         X Standards:    *Examinee climbs to the ADV platform, locates the I.A. isolation for 2-MS-190A (located on the Ctmt wall behind the ADV), and states that he would close it.*

Cue: I.A. isolation to 2-MS-190A is closed.

Comments:

### PERFORMANCE INFORMATION

PM ID NUMBER: JPM-207

TITLE: Local Manual Operation of the "A" Atmospheric Dump Valve

STEP 8 X Performance Steps: Remove the vent cap from the quick disconnect at the top the ADV operator diagram

GRADE     X Standards: *Examinee states that he would Remove the vent cap from the quick disconnect at the top the ADV operator diagram*

-  
Cue: Cap is removed;

Comments:

~~~~~  
STEP 9 X Performance Steps: Insert the "Vent Valve" assembly into the quick disconnect.

GRADE X Standards: *Examinee states that he would Install the vent valve into the quick disconnect at the top of the valve operator diagram*

Cue: Vent valve is inserted; air is bled off.

Comments:

~~~~~  
STEP 10 X Performance Steps: Open the vent valve assembly to ensure air has been vented off the ADV operator

GRADE     X Standards: *Examinee states Opening the vent valve and venting pressure from the diaphragm*

Cue: Air is bled off.

Comments:

## PERFORMANCE INFORMATION

PM ID NUMBER: JPM-207

TITLE: Local Manual Operation of the "A" Atmospheric Dump Valve

STEP 11 Performance Steps: ENSURE Atmospheric Dump Valve is closed.

GRADE Standards: *Examinee checks stem position indicator to ensure ADV is closed.*

Cue: *Valve is closed.*

Comments:

~~~~~

STEP 12 X Performance Steps: Remove handwheel restraining device and position the Atmospheric Dump Valve handwheel as directed by the Control Room.

GRADE X Standards: *Examinee state that he would remove the restraining device and then turn the handwheel in the clockwise direction until the position indicator pointer indicates 25% open.*

Cue: *Restraining device is removed; Position indicator is moving; position indicator is at 25% open.*

When it has been simulated that manual control has been taken and the valve is at 25% open, then this JPM is complete.

Comments: **After this step is completed, the JPM is considered complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

Job Performance Measure No. JPM -207

Rev. 0

Date Performed: _____

Operator: _____

Evaluator(s): _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**

Validated Time (minutes): 15

Actual Time to Complete (minutes): _____

Result of JPM: _____ (Denote by an S for satisfactory or a U for unsatisfactory)

Areas for Improvement:

EXAMINEE HANDOUT

JPM ID Number: 207

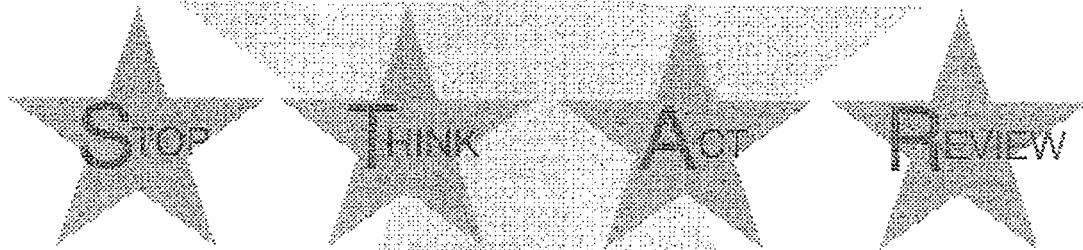
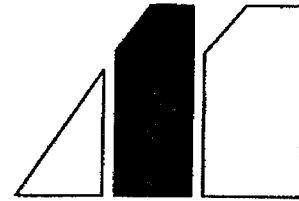
Initiating Cues:

- The US directs you to take local manual control of the "A" Atmospheric Dump Valve and open the valve to 25%.

Initial Conditions:

- A loss of I.A. has occurred in the plant.
- The plant has tripped and the decision has been made to use the "A" Atmospheric Dump Valve to remove decay heat.

**MILLSTONE NUCLEAR POWER STATION
EMERGENCY OPERATING PROCEDURE**



Standard Appendices

EOP 2541

Rev. 2

Approval Date: 1-8-01

Effective Date: 1-9-01

Level of Use
Continuous

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Appendix 36
ADV Local Operation

INSTRUCTIONS

CONTINGENCY ACTIONS



CAUTION



Elevated ambient air temperatures in the East and West penetration rooms may result in conditions that cause heat related health concerns.

1. ACCESS the East and West penetration rooms as follows:
 - a. DETERMINE local ambient air temperatures for the applicable penetration rooms by reading local area thermometers.

(continue)



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INSTRUCTIONS

CONTINGENCY ACTIONS

___1. (continued)

NOTE

The following equipment may be required to perform the following step:

1. Ice Vest may be obtained from the Maintenance Tool Crib.
2. Cool Suits may be obtained from the HP Control Point.
3. Gloves are part of the PEO normal watch station equipment.

b. CHECK local ambient air temperatures less than 120°F.

b.1 **IF BOTH** local ambient air temperatures for the East and West penetration rooms are greater than or equal to 150°F, RETURN to procedure step in effect.

b.2 **IF ANY** local ambient air temperature is between 120°F to 150°F, PERFORM the following:

- 1) NOTIFY EMTs of pending entry.
- 2) INITIATE use of Ice Vest and gloves.

___2. **IF** local operation of the ADV is desired,
Refer To Attachment 36–A,
“Establishing Local ADV Control.”

___3. **IF** remote operation of the ADV is desired,
Refer To Attachment 36–B,
“Restoring Remote ADV Control.”

STOP

THINK

ACT

REVIEW

**Millstone Unit 2
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Attachment 36–A Establishing Local ADV Control

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INSTRUCTIONS

CONTINGENCY ACTIONS

- ___ 1. ESTABLISH communications with the Control Room.
- ___ 2. ENSURE ADV manual isolation valve, MS–3A(B) is open.
- ___ 3. REMOVE the “VENT VALVE” assembly from the instrument rack located below the ADV.
- ___ 4. ENSURE the “VENT VALVE” assembly is closed.

NOTE

Isolating instrument air to an ADV will result in the valve failing to the closed position.

- ___ 5. CLOSE the instrument air isolation valve to the ADV.
- ___ 6. REMOVE the vent cap from the quick disconnect at the top of the ADV operator diaphragm.
- ___ 7. INSERT the “VENT VALVE” assembly into the quick disconnect.
- ___ 8. OPEN the vent valve assembly to ensure air has been vented off the ADV operator.
- ___ 9. ENSURE that the ADV is closed.
- ___ 10. REMOVE the handwheel retaining device.



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Attachment 36—A

Establishing Local ADV Control

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NOTE

ADV handwheels are reverse operated.

- ___ 11. POSITION the ADV as directed by
the Control Room.

STOP

THINK

ACT

REVIEW


JOB PERFORMANCE MEASURE APPROVAL SHEET

I. JPM Title: Placing CAR RBCCW Valve In Manual Local Operation.

ID Number: JPM-221

Revision: 0

II. Initiated:


Developer

2/23/01
Date

III. Reviewed:


Technical Reviewer

2/23/01
Date

IV. Approved:


User Department Supervisor

2/23/01
Date


Nuclear Training Supervisor

2/26/01
Date

JOB PERFORMANCE MEASURE WORKSHEET

Facility: MP-2

Examinee: _____

JPM Number: JPM-221

Rev. 0

Task Title: Placing CAR RBCCW Valve In Manual Local Operation

System: 2330A

Time Critical Task: Yes No X

Validated Time (minutes): 15

Task No.(s): NUTIMS #

Applicable To: SRO X RO X PEO X

K/A No.: #022-A4.04 K/A Rating: 3.1/3.2

Method of Testing:

Simulated Performance: X Actual Performance: _____

Location:

Classroom: _____ Simulator: _____ In-Plant: X

Task Standards:

At the completion of this JPM, the examinee will have simulated placing an RBCCW valve in manual local operation, and open.

Required Materials

(procedures,equipment):

- OP 2330A

General References:

OP2330A Section 4.6 (Rev. 019-03)

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

JOB PERFORMANCE MEASURE WORKSHEET

JPM Number: JPM-221

Rev. 0

Initiating Cues:

- The US has directed you to place 2-RB-28.1B in manual local control and stand by for directions.
- Where necessary the examiner will act as the Unit Supervisor.
- All other actions will be handled by others.

Initial Conditions:

- The RBCCW supply to the "B" CAR Cooler needs to be isolated for a leak repair.
- All administrative paperwork associated with isolating the cooler will be done by others.
- Valve 2-RB-28.1B (CAR Cooler "B" Inlet Isolation) is presently open.

Simulator Requirements: N/A

***** NOTES TO EXAMINER *****

1. Critical steps for this JPM are indicated with an "X". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions / observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM ID NUMBER: JPM-221 TITLE: Placing CAR RBCCW Valve In Manual Local Ops.

START TIME:

Note to Examiner:

STEP 1 X Performance Steps: Refer to OP 2330A 'RBCCW System' step 4.6 "Manual Operation of RBCCW CAR cooler valves".

GRADE X Standards: *Examinee obtains procedure OP 2330A and finds step 4.6 "Manual operation of RBCCW CAR Cooler valves".*

Cue: Examiner may give the examinee the procedure pages.

Comments: For purposes of this JPM the examinee will be performing the steps for 2-RB-28.1B. Some of the steps will be done at the valve (in the RCA), and in areas where access is limited. The required exam topic should be performed by standing near the valve and describing the operation.

~~~~~

STEP 2      X Performance Steps: Close instrument air isolation to 2-RB-28.1B

GRADE          X Standards:      *Examinee points to the "Whitey" air isolation valve and indicates that he would turn it in the clockwise direction to close.*

Cue: Examiner states the "Whitey" valve is closed

Comments:

~~~~~

STEP 3 X Performance Steps: Refer to Table 1 and determine applicable fuseblock to remove, examinee should request that personnel in the Control Room remove the fuse.

GRADE X Standards: *Examinee refers to Table 1 and identifies that fuse "DFM" in C-01R should be removed. Also the examinee may state that the valve should fail open when the fuse is removed.*

Cue: Examiner states that the fuse has been removed by Control Room personnel, that the sound of air release is heard, and the valve is moving to the open position..

PERFORMANCE INFORMATION

JPM ID NUMBER: JPM-221 TITLE: Placing CAR RBCCW Valve In Manual Local Ops.

Comments: The Examinee could also walk down the Control Boards inside CO-1R, prior to leaving the Control Room, to show where the fuse is and how it will be removed.

~~~~~

STEP 4      X Performance Steps: Loosen allen head screw on lever arm of "air cylinder" operating shaft.

GRADE          X Standards:      *Examinee indicates that he would use the attached allen wrench to loosen the screw.*

Cue: Examiner states that the allen screw is loose.

Comments:

~~~~~

STEP 5 Performance Steps: Operate the manual handwheel to align the manual operator shaft to valve stem for the lever arm insertion.

GRADE Standards: *Examinee states that he would move the manual handwheel to align the shaft.*

Cue: Examiner states that the shafts are now aligned.

Comments:

~~~~~

STEP 6      X Performance Steps: Loosen allen screw on lever arm of "Manual" operating shaft and Engage arm.

GRADE          X Standards:      *Examinee states that he must access the area under the valve and loosen the allen screw. He then would engage the lever arm for the manual operator.*

Cue: Examiner states that the lever arm is engaged.

Comments:

**PERFORMANCE INFORMATION**

JPM ID NUMBER: JPM-221 TITLE: Placing CAR RBCCW Valve In Manual Local Ops.

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STEP 7 X Performance Steps: Tighten the allen screw for the manual lever arm.

GRADE X Standards: *Examinee states that he would turn allen screw to tighten the lever arm for the manual handwheel.*

Cue: *Examiner states that the allen screw is tight.*

Comments:

~~~~~

STEP 8      X Performance Steps: Disengage the lever arm from the "air cylinder" operating shaft and tighten the allen screw to prevent the lever arm from becoming engaged again.

GRADE        X Standards:    *Examinee states that he would move the lever arm out of the way and that he may need to move the manual handwheel to relieve the tension on the arm to allow this. Also states that he would then tighten the allen screw (clockwise) to prevent the movement of the lever arm.*

Cue: *Examiner states that the lever arm is disengaged and allen screw is tight.*

Comments:

~~~~~

STEP 9 Performance Steps: Position valve as directed by the SM/US.

GRADE Standards: *Examinee may state that he would ensure Tech. Specs. were referred to and position the valve by direction of the SM/US.*

Cue: *Examiner states that the valve is positioned.*

Comments: **After this step is completed, the JPM is considered complete.**

STOP TIME:

VERIFICATION OF JPM COMPLETION

Job Performance Measure No. JPM-221

Rev. 0

Date Performed: _____

Operator: _____

Evaluator(s): _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**

Validated Time (minutes): _____

Actual Time to Complete (minutes): _____

Result of JPM: _____ (Denote by an S for satisfactory or a U for unsatisfactory)

Areas for Improvement:

EXAMINEE HANDOUT

JPM ID Number:

JPM-221

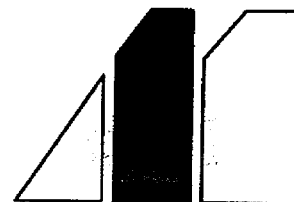
Initiating Cues:

- The US has directed you to place 2-RB-28.1B in manual local control and stand by for directions.
- Where necessary the examiner will act as the Unit Supervisor.
- All other actions will be handled by others.

Initial Conditions:

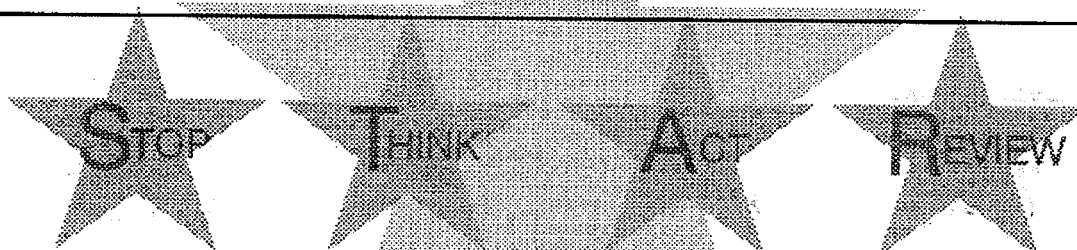
- The RBCCW supply to the "B" CAR Cooler needs to be isolated for a leak repair.
- All administrative paperwork associated with isolating the cooler will be done by others.
- Valve 2-RB-28.1B (CAR Cooler "B" Inlet Isolation) is presently open.

**MILLSTONE NUCLEAR POWER STATION
SYSTEM OPERATING PROCEDURE**



RBCCW System

**OP 2330A
Rev. 019-05**



Approval Date: 12-5-00

Effective Date: 12-6-00

Level of Use
General

**Millstone Unit 2
System Operating Procedure**

RBCCW System

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1. PURPOSE

1.1 Objective

This procedure provides instructions for the operation of the RBCCW System and its various components.

1.2 Discussion

RBCCW headers are served by one common surge tank. Separation of headers is accomplished by a weir in the lower half of surge tank (approximately 45%).

RBCCW reanalysis has had the following effects on RBCCW Operation:

- A flow balance was performed to ensure the system can meet its design bases assumptions. This flow balance ensured that both minimum and maximum flowrates were met for components. Minimum flow to each component ensures that it can perform its design function and maximum flow ensures that other loads do not starve flow from the CAR coolers. A table of flowrate ranges for informational use only, is contained in Attachment 3.
- To balance the RBCCW System, numerous manual valves and AOVs were throttled as recommended by Engineering in references 6.39 and 6.40. The throttled positions of these valves are listed in OPS Forms 2611C-2 and 2611D-2. Except for components identified in the Precautions Section, changing throttle valve positions may render the RBCCW train inoperable. Closing valves for component isolation does not affect RBCCW operability.
- A flow balance verification will be performed each refueling outage and the need for a flow balance will be evaluated after system maintenance is performed.

RBCCW component relief valves have been gagged in accordance with Minor Mod DM2-00-0355-00 to prevent inadvertant lifting and subsequent failure to reseal, which could challenge the system's ability to meet its design requirements.

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To provide overpressure protection for the affected components, an overpressure relief path must be maintained. This protection is accomplished by ensuring that the valves in the credited relief path remain locked open or otherwise administratively controlled open. Prior to shutting any valve in these relief paths, the relief valve gags for the affected components must be removed or an operator stationed at the component during its inservice time capable of reopening the isolation prior to leaving.

3

2. PREREQUISITES

2.1 General

2.1.1 Power is available to the following load centers:

- Bus 24C, for "A" RBCCW pump
- Bus 24D, for "C" RBCCW pump
- Bus 24E, for "B" RBCCW pump
- MCC B51, for Containment isolations, 2-RB-37.2A and 2-RB-30.1A
- MCC B61, for Containment isolations, 2-RB-37.2B and 2-RB-30.1B
- 125 VDC, control power for breakers and valves

2.1.2 The following systems are in service or available to support RBCCW System operations:

- Service Water System
- Instrument Air System
- Primary Makeup Water System
- Primary Chemical Addition System

2.2 Documents

2.2.1 OP 2265, "Requirements for Draining and Filling Activities"

2.2.2 OP 2326A, "Service Water System"

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- 2.2.3 OP 2336A, "Station Sumps and Drains"
- 2.2.4 OP 2337, "Gaseous Radwaste System"
- 2.2.5 OPS Form 2611C-2, "RBCCW System Valve Alignment, Facility 1"
- 2.2.6 OPS Form 2611D-2, "RBCCW System Valve Alignment, Facility 2"
- 2.2.7 OPS Form 2604G-1, "Containment Sump and SDC HX RBCCW Outlet Valves Operability Tests, Facility 1"
- 2.2.8 OPS Form 2604H-1, "Containment Sump and SDC HX RBCCW Outlet Valves Operability Tests, Facility 2"
- 2.2.9 2-OPS-6.23, "Temporary Logs"

3. PRECAUTIONS

- 3.1 If RBCCW flow in either header is lost and cannot be quickly restored, components served by that header must be shutdown. This may necessitate a plant trip.
- 3.2 RBCCW pump(s) may be started twice consecutively, from ambient temperatures or once from rated temperature. Additional motor starts are governed by motor temperature. The motor is assumed to have returned to rated temperature after 60 minutes idle time or 20 minutes running time, at which time another start is permissible.
- 3.3 Hydrazine concentration in RBCCW System is maintained between 5 to 35 ppm (Chemistry program limits).
- 3.4 RBCCW temperature at the outlet of RBCCW heat exchangers should *not* exceed 85°F during normal at power operations [♣ Refs. 6.23, 6.24, 6.25, Ref. 6.17].
- 3.5 Prolonged system (i.e., operation greater than 1-2 days) operation with flow rates less than 4,000 gpm or pump discharge pressure greater than 140 psig should be avoided by placing components in service as necessary, to increase flow and decrease pressure.

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- 3.6 Supplying RBCCW flow to the SDC Hx during Modes 1, 2, or 3* (with pressurizer pressure greater than or equal to 1750 psia) will render the RBCCW header inoperable.
- 3.7 Operation of ESF Room cooler does not render the train inoperable however sustained operation should be avoided.
- 3.8 Procedurally allowed changes to the following loads during normal operations does not render the train inoperable:
- Blowdown Quench Tank
 - SFP Cooling
 - Sample Coolers (X-192, X-64, X-65)
 - Letdown
 - Degasifier
- 3.9 Low header flows (less than 5,550 gpm), result in higher pump vibrations. To maximize life of pump bearings, RBCCW header flows should be maintained greater than or equal to 6,000 gpm whenever possible [Ref. 6.18].
- 3.10 Chemistry must be notified of initiating any RBCCW drain to liquid radwaste which exceeds normal system operating leakage and venting to ensure appropriate Aerated Waste hydrazine monitoring is performed.
- 3.11 RBCCW header flow should be maintained at less than 8000 gpm to minimize the possibility of pump runout.
- 3.12 Operation of the RBCCW pumps at greater than 7,300 gpm, a banging noise may be observed. This noise is the RBCCW pump discharge check valve disk impacting the backstop. This condition has been evaluated and is acceptable [Ref. 6.20]. Time with flow greater than 7,300 gpm should be minimized.
- 3.13 Care should be used when manually operating the CAR cooler valves. Valves operate easily and once the valve hits it's backstop, no additional closing force is required to close the valve. Forcing operator onto its stop may cause damage to operator.

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- 3.14 RBCCW flow through each CAR cooler should *not* exceed 2,250 gpm during normal or shutdown operation. Flow rates up to 2,400 gpm are allowed for short durations while manipulating valves during plant shutdown conditions.
- 3.15 RBCCW component relief valves have been gagged in accordance with Minor Mod DM2-00-0355-00. Selected system valves have been locked open to provide a vent path to provide overpressure protection while the components relief valve is gagged. If a component is isolated with the vents and drains closed, the applicable component relief valve must be ungagged or have an operator in attendance.

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4.6 Manual Operation of RBCCW CAR Cooler Valves



CAUTION

1. Care should be used when manually operating the following CAR cooler valves. Valves operate easily and once the valve hits its backstop, no additional closing force is required to close the valve. Forcing operator onto its stop may cause damage to operator.
 - "A" CAR cooler inlet, 2-RB-28.1A
 - "B" CAR cooler inlet, 2-RB-28.1B
 - "C" CAR cooler inlet, 2-RB-28.1C
 - "D" CAR cooler inlet, 2-RB-28.1D
 - "A" CAR normal outlet, 2-RB-28.2A
 - "B" CAR normal outlet, 2-RB-28.2B
 - "C" CAR normal outlet, 2-RB-28.2C
 - "D" CAR normal outlet, 2-RB-28.2D
 - "A" CAR emergency outlet, 2-RB-28.3A
 - "B" CAR emergency outlet, 2-RB-28.3B
 - "C" CAR emergency outlet, 2-RB-28.3C
 - "D" CAR emergency outlet, 2-RB-28.3D
 - "A" CAR cooler RBCCW outlet isolation, 2-RB-29A
 - "B" CAR cooler RBCCW outlet isolation, 2-RB-29B
 - "C" CAR cooler RBCCW outlet isolation, 2-RB-29C
 - "D" CAR cooler RBCCW outlet isolation, 2-RB-29D
 - "A" header surge tank outlet isolation, 2-RB-1A
 - "B" header surge tank outlet isolation, 2-RB-1B
 - "A" SFPC HX RBCCW inlet, 2-RB-7A
 - "B" SFPC HX RBCCW inlet, 2-RB-7B
 - "A" SFPC heat exchanger RBCCW outlet, 2-RB-8A
 - "B" SFPC heat exchanger RBCCW outlet, 2-RB-8B
2. RBCCW flow through each CAR cooler should *not* exceed 2,250 gpm during normal or shutdown operation. Flow rates up to 2,400 gpm are allowed for short durations while manipulating valves during plant shutdown conditions.

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NOTE

1. Two allen wrenches are located locally at *each* valve.
2. The manual actuator is *reverse* operating on the RBCCW CAR cooler valves.

4.6.1 To place *any* CAR cooler valve to manual, PERFORM the following:

- a. CLOSE instrument air isolation to air operator.
- b. Refer To Table 1 "RBCCW CAR Cooler Valve Fuseblocks" and DETERMINE applicable fuseblock.

Table 1
RBCCW CAR Cooler Valve Fuseblocks

Valve	Fuseblock (C-01R)
"A" CAR cooler inlet, 2-RB-28.1A	CFM
"B" CAR cooler inlet, 2-RB-28.1B	DFM
"C" CAR cooler inlet, 2-RB-28.1C	CFN
"D" CAR cooler inlet, 2-RB-28.1D	DFN
"A" CAR normal outlet, 2-RB-28.2A	CFXG
"B" CAR normal outlet, 2-RB-28.2B	DFXH
"C" CAR normal outlet, 2-RB-28.2C	CFXH
"D" CAR normal outlet, 2-RB-28.2D	DFXG
"A" CAR emergency outlet, 2-RB-28.3A	CFD
"B" CAR emergency outlet, 2-RB-28.3B	DFA
"C" CAR emergency outlet, 2-RB-28.3C	CFJ
"D" CAR emergency outlet, 2-RB-28.3D	DFB

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NOTE

The following step removes electrical power to operating air solenoid, causing valve to fail open.

- _____ c. REMOVE fuseblock for valve being placed in manual (C-01R).
- _____ d. LOOSEN allen head screw on lever arm of *air cylinder* operating shaft.
- _____ e. To align manual operator shaft to valve stem for lever arm insertion, OPERATE manual handwheel.
- _____ f. LOOSEN allen head screw on lever arm of *manual* operating shaft and ENGAGE lever arm.
- _____ g. TIGHTEN allen head screw on lever arm of *manual* operating shaft.

NOTE

Slight movement of manual handwheel may be required to relieve tension.

- _____ h. DISENGAGE lever arm from *air cylinder* operating shaft and ROTATE allen head screw *clockwise* enough to prevent inadvertent engagement of air cylinder.
- _____ i. To position valve, PERFORM the following:
 - _____ 1) IF in MODES 1, 2, or 3 (with pressurizer pressure greater than or equal to 1,750 psia), AND valve to be positioned is a CAR cooler inlet valve or a CAR cooler emergency outlet valve, Refer To TS 3.6.2.1, "Containment Spray and Cooling Systems," and LOG into applicable TSAS.
 - _____ 2) OPERATE handwheel to position valve as directed by SM or US.

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4.6.2 To restore *any* CAR cooler valve to automatic, **PERFORM** the following:

NOTE

Open position is fail position.

- a. Using manual handwheel, OPEN valve.

NOTE

Slight movement of manual handwheel may be required for proper alignment.

- b. **LOOSEN** allen head screw on lever arm of *air cylinder* operating shaft and **ENGAGE** lever arm.
- c. **TIGHTEN** allen head screw on lever arm of *air cylinder* operating shaft.
- d. **LOOSEN** allen head screw on lever arm of *manual* operating shaft and **DISENGAGE** lever arm.
- e. **ROTATE** allen head screw on lever arm of *manual* operating shaft *clockwise* enough to prevent inadvertent engagement of handwheel.
- f. **INSTALL** applicable fuseblock, listed in step 4.6.1 b., for valve being placed in automatic operation.
- g. **OPEN** instrument air isolation to air operator.
- h. **IF** in MODES 1, 2, or 3 (with pressurizer pressure greater than or equal to 1,750 psia), **AND** valve positioned is a CAR cooler inlet valve or a CAR cooler emergency outlet valve, Refer To TS 3.6.2.1, "Containment Spray and Cooling Systems," and LOG out of applicable TSAS.

– End of Section 4.6 –

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