# INITIAL SUBMITTAL OF ADMINISTRTATIVE JPMS

# FOR THE DUANE ARNOLD EXAMINATION

# THE WEEK OF APRIL 9, 2001

# *DUANE ARNOLD ENERGY CENTER*

## JOB PERFORMANCE MEASURE

**NUMBER: 2.4.43-01**

**TASK NUMBER: SRO 3.01**

**TITLE: Perform OP-28, EPIP OFFSITE AGENCIES NOTIFICATION WEEKLY TEST**

**Rev. 0**

| | | |
|---|---|---|
| DEVELOPED BY: | Instructor | 2/3/2001<br>Date |
| VALIDATED BY: | SME/Instructor | 2/3/01<br>Date |
| REVIEWED BY: | Plant Reviewer | 2/4/01<br>Date |
| APPROVED BY: | Training Supervisor-Operations | 2/5/01<br>Date |

# DUANE ARNOLD ENERGY CENTER

## JOB PERFORMANCE MEASURE

| | | |
|---|---|---|
| **JPM No.** 2.4.43-01 | **JPM Description:** Perform Op-28, EPIP Offsite Agencies Notification Weekly Test | |
| **Task No.** SRO 3.01 | **Task Description:** Implement Emergency Plan | |
| **K/A Reference:** 2.4.43 | 2.8/3.5 | |
| APPLICABLE METHOD OF TESTING: SRO/RO | | |
| Simulate Performance | Actual Performance X | |
| Simulator X | In-Plant | Control Room X |
| Time for Completion: 10 minutes | | |

# JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE

All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 7 through 10.

JPM No. 2.4.43-01 JPM Title Perform Op 28, EPIP Offsite Agencies Notification Weekly Test.

✓ 1. Task description and number, JPM description and number are identified

✓ 2. Task elements identified and K/A references are included

✓ 3. Performance location specified

a. in-plant

b. control room

c. simulator

✓ 4. Initial conditions and cues identified

a. setup, required materials, and procedure

b. malfunctions and instructor actions

c. initiating and terminating cues

✓ 5. Task standards identified and verified by SME review

✓ 6. Critical tasks/steps identified meet criteria and identified with a "C"

✓ 7. Verify JPM steps fit the most current procedures
Procedure Rev. 5 Date APR 14, 1999

✓ 8. Pilot test JPM

a. verify cues both verbal and visual are free of conflict

b. ensure performance time is accurate

9. If the JPM cannot be performed as written with proper responses, then revise the JPM

____ 10. When JPM is revalidated, SME/Instructor signs and dates JPM

SME/Instructor Date

SME/Instructor Date

SME/Instructor Date

**SIMULATOR SETUP:**

None

**EVENT TRIGGERS**

None

**MALFUNCTIONS:**

None

**OVERRIDES:**

None

**REMOTE FUNCTIONS:**

None

## INSTRUCTOR ACTIONS:

1. Inform the Shift Manager that ACTUAL performance of this JPM will occur prior to commencement.

2. Notify offsite agencies to expect multiple tests.

3. Read initial conditions and initiating cues to the operator.

## TASK STANDARDS:

NOTE: This test would normally be performed by the OSS or STA. Notifications would be made by Operations personnel during a Security Emergency.

1. Communication has been established with offsite agencies. (Linn County, Benton County and Iowa Emergency Management Agencies)
2. Linn County, Benton County and Iowa Emergency Management Agencies verified to be on the microwave telephone line.
3. Offsite agencies notified that this a test of the DAEC Notification System and that a FAX will be sent.
4. Microwave telephone receiver hung up.
5. FAX form inserted into the Control Room FAX machine.
6. #01 push button depressed.

## REQUIRED MATERIALS:

OP-28

## GENERAL REFERENCES:

OP 28

**Read to the operator the following information:**

**INITIAL CONDITIONS:**

1. You are the Shift Supervisor on the 0700 to 1900 shift.
2. It is currently 1000.
3. All necessary personnel have been notified to expect ACTUAL performance of this JPM.

**INITIATING CUES:**

1. The Shift Manager directs you to perform Op-28, EPIP Offsite Agencies Notification Weekly Test.

**This task is not time critical.**

**Inform the evaluator when you have completed the task.**

## PERFORMANCE INFORMATION

NOTE:

Critical steps are denoted with a "C". Failure to meet the standard for this step constitutes failure.

Time Start _____

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: **C** | Pick up Control Room Microwave telephone receiver, select line 2, dial 9999. |
| STANDARD: | Communication has been established with offsite agencies. (Linn County, Benton County and Iowa Emergency Management Agencies) |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: **C** | Verify offsite agencies answer. |
| STANDARD: | Linn County, Benton County and Iowa Emergency Management Agencies verified to be on the microwave telephone line. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: | After the offsite agencies have answered, dial #### to cancel the ringer. |
| STANDARD: | #### dialed. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: **C** | Inform offsite agencies that this is a test of the DAEC Notification System and that a test FAX will be sent. |
| STANDARD: | Offsite agencies notified that this a test of the DAEC Notification System and that a FAX will be sent. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: | Ask for a call back at 2222 if FAX is not received. |
| STANDARD: | A call back is asked for if the FAX is not received. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: **C** | Hang up the microwave telephone receiver. |
| STANDARD: | Microwave telephone receiver hung up. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: **C** | Insert FAX form (Attachment 1) into Control Room FAX face down. |
| STANDARD: | FAX form inserted into the Control Room FAX machine. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: **C** | After "Document Ready" message is displayed, push button #01 for normal hours or #02 for off-hours. |
| STANDARD: | #01 push button depressed. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: | After the FAX has been sent, the machine will print out "Activity Report". Include this with the procedure. |
| STANDARD: | Activity Report included with OP-28. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: | Verify that the Activity Report indicates the FAX forms were received. |
| STANDARD: | Receipt of the Fax forms has been verified. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: | If any offsite agencies cannot be contacted via the Control Room microwave telephone, contact those agencies using the telephone numbers of the Emergency Telephone Book (N/A if no problems). |
| STANDARD: | Offsite agencies have been contacted using the numbers in the Emergency Telephone Book (N/A if no problems). |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: | If any problems are encountered with the FAX, inform the Supervisor of Emergency Planning during normal working hours. (N/A if no problems) |
| STANDARD: | Supervisor of Emergency Planning notified of any problems noted during the test. |
| COMMENTS: | |

Time Stop _____

**TERMINATING CUES:** OP-28 completed.

## VERIFICATION OF COMPLETION

JPM No.: 2.4.43-01 JPM Description: Perform OP-28, EPIP Offsite Agencies Notification Weekly Test

Operator: _____ Evaluator: _____

Licensee: ☐ RO ☐ SRO ☐ SRO Cert
☐ STA ☐ NSPEO

Result: ☐ SATISFACTORY ☐ UNSATISFACTORY

**COMMENTS/FEEDBACK:** (Note any trainee discrepancies or misperformed steps.)

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_____ _____
Evaluator's Signature Date

# *DUANE ARNOLD ENERGY CENTER*

## JOB PERFORMANCE MEASURE

NUMBER: 2.1.7-03 (G2.1.7)

TASK NUMBER: SRO 1.02

TITLE: Actions to Return MOV to Operable Status

Rev. 1

| | | |
|---|---|---|
| DEVELOPED BY: | Instructor | 1/4/00<br>Date |
| VALIDATED BY: | SME/Instructor | 2/24/00<br>Date |
| REVIEWED BY: | Plant Reviewer | 2-24-00<br>Date |
| APPROVED BY: | Training Supervisor-Operations | 2/28/00<br>Date |

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

| | | |
|---|---|---|
| **JPM No.** 2.1.7-03 | **JPM Description:** Actions to return MOV to operable status | |
| **Task No.** 1.02 | **Task Description:** Determine operability for technical specification required components | |
| **K/A Reference:** 2.1.7 (4.4) PWG | | |
| APPLICABLE METHOD OF TESTING: SRO | | |
| Simulate Performance | Actual Performance X | |
| Simulator X | In-Plant | Control Room |
| Time for Completion: 10 minutes | | |

# JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

| NOTE |
|---|
| All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 7 through 10. |

JPM No. 2.1.7-03 JPM Title Actions to return MOV to operable status

✓ 1. Task description and number, JPM description and number are identified

✓ 2. Task elements identified and K/A references are included

✓ 3. Performance location specified

   a. in-plant

   b. control room

   c. simulator

✓ 4. Initial conditions and cues identified

   a. setup, required materials, and procedure

   b. malfunctions and instructor actions

   c. initiating and terminating cues

✓ 5. Task standards identified and verified by SME review

✓ 6. Critical tasks/steps identified meet criteria and identified with a "C"

✓ 7. Verify JPM steps fit the most current procedures
   Procedure Rev. _____ Date _____

✓ 8. Pilot test JPM

   a. verify cues both verbal and visual are free of conflict

   b. ensure performance time is accurate

9. If the JPM cannot be performed as written with proper responses, then revise the JPM

_____ 10. When JPM is revalidated, SME/Instructor signs and dates JPM

_____ _____
SME/Instructor Date

_____ _____
SME/Instructor Date

_____ _____
SME/Instructor Date

## SIMULATOR SETUP:

IC: None

## EVENT TRIGGERS:

None

## MALFUNCTIONS:

None

## OVERRIDES:

None

## REMOTE FUNCTIONS:

None

## INSTRUCTOR ACTIONS:

1. Obtain a copy of OI 151 Attachment 6, fill out and add the additional information from Step 2 in the margin, sign the Completed By and Reviewed By signature blocks.
2. Add the following statement handwritten in the margin beside MO-2115: MO-2115 was declutched and opened an additional 1/8 of a turn in order to receive the OPEN light.

## TASK STANDARDS:

1. Applicant does not sign the Ready For S/U block.
2. Seven Day LCO time clock started.
3. IPOI 7, Section 7.2 reviewed and corrective action commenced

## REQUIRED MATERIALS:

OI-151, Attachment 6 completed and signed off UP TO the Ready for S/U OSS signature block.

## GENERAL REFERENCES:

IPOI 7, 7.2, Manually Backseating A Motor Operated Valve

DAEC, Technical Specifications, 3.5, page 3.5-1

**Read to the operator the following information:**

INITIAL CONDITIONS:

1. You are on shift as the OSS and IPOI 1, Startup Checklist, is in progress.
2. All systems are operable and the plant is in Mode 3.

INITIATING CUES:

As the Shift Manager, I am directing you to complete the review of this Core Spray System Control Panel Lineup and sign the Ready for S/U block when your review is complete.

**This task is not time critical.**

**Inform the evaluator when you have completed the task.**

## PERFORMANCE INFORMATION

| NOTE: |
|---|
| Critical steps are denoted with a "C". Failure to meet the standard for this step constitutes failure. |

Time Start _____

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Core Spray System Control Panel Lineup, OI-151A6 (Attachment 6 of OI-151), is reviewed and the information in the margin beside MO-2115 is found. |
| STANDARD: | Applicant reviews the Core Spray Control Panel Lineup, ATT. 6 of OI 151, discovers the information in the margin beside MO-2115 and does not sign the Ready for S/U signature block. |
| COMMENTS:<br><br>CUE: When the Applicant communicates this to you, as the Shift Manager, direct him/her to carry out any additional requirements. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | IPOI 7, Section 2.0 (3) the valve must be declared INOP. This INOP status also includes one loop of Core Spray. |
| STANDARD: | Applicant declares MO-2115 INOP. |
| COMMENTS: | |

CUE: If the Applicant wants to initiate an Action Request (AR), inform him/her that the AR will be completed by the STA when all determinations have been made.

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Core Spray is required in Modes 1, 2, & 3. TS 3.5.1.B states that with one loop of CS inoperable, all low pressure ECCS must be operable. As an initial condition, all ECCS systems were operable. Restore to operable within 7 days. |
| STANDARD: | Applicant declares "A" Core Spray Subsystem inoperable and states there is a 7 day completion time (LCO). |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Return valve M0-2115 to an operable status IAW IPOI 7, Section 7.2, Manually Backseating a Motor Operated Valve, 7.1, Manually Seating a Motor Operated Valve, step (9). |
| STANDARD: | Applicant directs MO-2115 be cycled electrically and timed OR has an operability determination commenced. |
| COMMENTS:<br><br>Evaluator Cue: Inform applicant his/her stated actions are being performed. | |

Time Stop _____

**TERMINATING CUES:**

1. Seven Day LCO time clock started.

2. IPOI 7, Section 7.2 reviewed and corrective action commenced.

## VERIFICATION OF COMPLETION

JPM No.: 2.1.7-03 JPM Description: Actions to return MOV to operable status

Operator: _____ Evaluator: _____

Licensee: ☐ RO ☐ SRO ☐ SRO Cert
☐ STA ☐ NSPEO

Result: ☐ SATISFACTORY ☐ UNSATISFACTORY

**COMMENTS/FEEDBACK:** (Note any trainee discrepancies or misperformed steps.)

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Evaluator's Signature Date

# OI 151 ATTACHMENT 6
# CORE SPRAY SYSTEM
# CONTROL PANEL LINEUP

**NOTE**

This page is to be kept in the Control Room with the Startup Package

I have read and understand the instructions for performance of System Control Panel Lineups.

Scott [illegible]
Signature

Discrepancies:

| Clearance Number | Control Device | Control Panel | Wvd./Rstr. |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
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| | | Date | Time |
|---|---|---|---|
| Completed by: | Scott [illegible] | 2/24/00 | 0930 |
| Reviewed by: | Wayne Reuder<br>Senior Licensed Operator | 2/24/00 | 1040 |
| Ready for S/U: | Operations Shift Supervisor | | |

# OI 151 ATTACHMENT 6

## CORE SPRAY SYSTEM

## CONTROL PANEL LINEUP

| Device Number | Panel | Description | Discrep. | Wvd./ Rstr. | Init. | Req'd. Pos. |
|---|---|---|---|---|---|---|
| MO-2147 | 1C03 | INBD TORUS SUCTION MO-2147 HS-2147 | | | | OP/OP |
| MO-2100 | 1C03 | OUTBD TORUS SUCTION MO-2100 HS-2100 | | | | OP/OP |
| HS-2103 | 1C03 | A CORE SPRAY PUMP 1P-211A | | | | AUTO |
| MO-2104 | 1C03 | MIN FLOW BYPASS MO-2104 | | | | AUTO/ OPEN |
| MO-2112 | 1C03 | TEST BYPASS MO-2112 | | | | AUTO/ CLOSED |
| MO-2115 | 1C03 | OUTBD INJECT MO-2115 | | | | AUTO/ OPEN |
| MO-2117 | 1C03 | INBD INJECT MO-2117 | | | | AUTO/ CLOSED |
| ZS-2142 | 1C03 | MANUAL ISOLATION V-21-42 | | | | OP |
| MO-2146 | 1C03 | INBD TORUS SUCTION MO-2146 HS-2146 | | | | OP/OP |
| MO-2120 | 1C03 | OUTBD TORUS SUCTION MO-2120 HS-2120 | | | | OP/OP |
| HS-2123 | 1C03 | B CORE SPRAY PUMP 1P-211B | | | | AUTO |

* 102115 declutched and opened additional 8 turn order to receive the open indication

# OI 151 ATTACHMENT 6

## CORE SPRAY SYSTEM

## CONTROL PANEL LINEUP

| Device Number | Panel | Description | Discrep. | Wvd./ Rstr. | Init. | Req'd. Pos. |
|---|---|---|---|---|---|---|
| MO-2124 | 1C03 | MIN FLOW BYPASS MO-2124 HS-2124 | | | | AUTO/ OPEN |
| MO-2132 | 1C03 | TEST BYPASS MO-2132 HS-2132 | | | | AUTO/ CLOSED |
| MO-2135 | 1C03 | OUTBD INJECT MO-2135 HS-2135 | | | | AUTO/ OPEN |
| MO-2137 | 1C03 | INBD INJECT MO-2137 HS-2137 | | | | AUTO/ CLOSED |
| ZS-2143 | 1C03 | MANUAL ISOLATION V-21-43 | | | | OP |
| E21A-S11A | 1C43 | Essential Bus 1A3 Undervoltage Test (E21A-S11A) | | | | NORM |
| E21A-S12A | 1C43 | Essential Bus 1A3 Undervoltage Test (E21A-S12A) | | | | NORM |
| E21A-S14A | 1C43 | A SBDG Start Test (E21A-S14A) | | | | NORM |
| E21A-S16A (HS-2103A) | 1C43 | 1P-211A SUCTION PATH INTERLOCK (E21A-S16A) | | | | NORM |
| E21A-S11B | 1C44 | Essential Bus 1A4 Undervoltage Test (E21A-S11B) | | | | NORM |
| E21A-S12B | 1C44 | Essential Bus 1A4 Undervoltage Test (E21A-S11B) | | | | NORM |
| E21A-S14B | 1C44 | B SBDG Start Test (E21A-S14B) | | | | NORM |
| E21A-S16B (HS-2123C) | 1C44 | 1P-211B SUCTION PATH INTERLOCK (E21A-S16B) | | | | NORM |

# INTEGRATED PLANT OPERATING INSTRUCTION

# IPOI 7

# SPECIAL OPERATIONS

Effective Date: NOV 03 2000

## TECHNICAL REVIEW

Prepared by: D. Boston Date: 9-25-00

Validated by: Thomas R. Zimmerman Date: 10-3-00
Operations Staff

Verified by: Keith Hale Date: 10-3-00
System Engineer

Reviewed by: D. Boston for Date: 10-5-00
Operations Committee

## PROCEDURE APPROVAL

I am responsible for the technical content of this procedure.

Approved by Procedure Owner: Timothy E. Allen Date: 25 Sept 00
Operations

Approved by: Dean Curtis Date: 10-6-00
Plant Manager-Nuclear

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## 1.0 PURPOSE

To provide detailed instructions to plant operating personnel for special operations.

## 2.0 PRECAUTIONS AND LIMITATIONS

(1) Concerning Drywell Entries:

(a) If the Drywell-to Torus downcomers are not sealed, the Drywell shall be classified and controlled as a Housekeeping Zone III and a Material Accountability Log (MAL) shall be required per ACP 1408.11

(b) The "Buddy System" should be used for all Containment entries when the RPV is above atmospheric pressure.

(c) Personnel shall not be in the Drywell when RPV pressure is above 400 psig, except with Plant Manager concurrence.

(d) Drywell entry shall not be made when moving fuel, unless the "cattle chute" is installed per RFP 106.

(e) An Operator shall be present to operate the Drywell Airlock during Drywell entry when primary containment is required.

(f) During Drywell entry when all control rods in cells with fuel are not fully inserted, an Operator shall monitor Panel 1C05 to ensure steady-state conditions.

(g) If primary containment entry is required after closeout, personnel entering the area shall be escorted by Operations personnel.

(2) Concerning the manual seating and backseating of motor operated valves (MOVs):

(a) MOVs may only be backseated to isolate a packing leak and then only after operability requirements have been considered.

(b) This procedure does not apply to electrically backseating MOVs. Electrically backseating MOVs shall be performed per a detailed engineering evaluation or in accordance with an OC approved procedure.

(c) The manual backseating of MOVs should only occur after all attempts to adjust the packing have failed to isolate the packing leak.

(d) This procedure applies to manual seating of MOVs for the purposes of isolating valve leak-by and also for checking a MOV in the closed position.

(e) Whenever possible, MOVs should be electrically cycled in an attempt to reseat the valve and isolate the leak-by prior to any manual seating.

(f) Do not force the declutch lever into the disengaged position after manual operation of the MOV. The declutch lever returns automatically to the disengaged position when the motor is energized.

(g) Torque switch failure and subsequent valve/operator damage may occur as a result of declutching Limitorque SMB-00-MOVs without upgraded torque switches (those with green information labels) while in the torque closed position. If declutching the MOV in this position is required, contact Maintenance to inspect the torque switch for failure and/or fully cycle the MOV twice to verify proper torque switch operation before declaring the MOV operable.

(3) Any MOV should be considered inoperable if it is declutched for manual operation or position checking until the valve has been stroked electrically or an operability determination has been performed per section 7.0.

## 7.2 MANUALLY BACKSEATING A MOTOR OPERATED VALVE

**CAUTION**

Electrically backseating an MOV may result in valve or operator damage. Electrical backseating of an MOV shall not be performed unless engineering justification is provided (e.g., Plant Effect Evaluation, NG Memo) and the work is controlled by a Temporary Modification.

(1) Notify Program Engineering of the MOV which requires manual backseating and obtain the allowable backseating handwheel torque value (Ref. MOV 6.32 and NG-95-3027). _____

(2) Obtain the correct size handwheel spider wrench and a calibrated torque wrench capable of developing the allowable handwheel torque from the tool crib. _____

(3) Manually backseat the MOV by torquing the handwheel until the leak stops or until the allowable handwheel torque value is reached, whichever occurs first. _____

(4) Make a log entry which includes the MOV ID and the as-left handwheel torque value. Record the torque wrench ID and calibration due date in accordance with ODI-10, Operations Test Instrument Use History Log. _____

(5) If the valve packing leak continues after the allowable handwheel torque value is reached contact Program Engineering for further assistance. _____

(6) Ensure a Maintenance Action Request has been written to repair the valve leak-by. _____

(7) Verify compliance with Technical Specifications for potential system or containment penetration inoperability. _____

(8) If MOV operability is not desired continue to step (10). _____

(9) If MOV operability is desired, perform the following:

(a) Electrically stroke and time the MOV. Make a log entry which includes the MOV ID and stroke time(s). Record the stopwatch ID and stopwatch calibration due date in accordance with ODI-10. _____

(b) Manually backseat the MOV by retorquing the handwheel to the torque value that was previously reached. _____

(c) Verify the MOV stroke time is within the Technical Specification and ASME allowable stroke times. Contact the IST Engineer for assistance if the ASME allowable stroke times are exceeded. _____

(10) The OSS shall request Engineering to perform an evaluation of the MOV which was manually seated. This evaluation should be performed within 72 hours and address the following: _____

(a) Stresses on the valve and operator

(b) Local Leak Rate Testing (LLRT) concerns

(c) Capability of the operator to close the valve

(d) The need for increased surveillance

(e) The use of MOV diagnostic testing equipment to measure the loading

(f) Requirement to replace the valve packing

# *DUANE ARNOLD ENERGY CENTER*

## JOB PERFORMANCE MEASURE

**NUMBER: 2.1.33-04**

**TASK NUMBER: SRO 1.02**

**TITLE: Determine Rod Block Monitor Operability Requirements**

**Rev. 0**

| | | |
|---|---|---|
| DEVELOPED BY: | Instructor | 2/3/2001<br>Date |
| VALIDATED BY: | SME/Instructor | 2/3/01<br>Date |
| REVIEWED BY: | Plant Reviewer | 2/4/01<br>Date |
| APPROVED BY: | Training Supervisor-Operations | 2/13/01<br>Date |

# DUANE ARNOLD ENERGY CENTER

## JOB PERFORMANCE MEASURE

| | | |
|---|---|---|
| **JPM No.** 2.1.33-04 | **JPM Description:** Determine Rod Block Monitor Operability Requirements | |
| **Task No.** SRO 1.02 | **Task Description:** Determine Operability for Technical Specification Required Components | |
| **K/A Reference:** **2.1.33** | 3.4/4.0 | |
| APPLICABLE METHOD OF TESTING: SRO/RO | | |
| Simulate Performance | Actual Performance X | |
| Simulator X | In-Plant | Control Room |
| Time for Completion: 6 minutes | | |

# JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE

All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 7 through 10.

JPM No. 2.1.33-04 JPM Title Determine Rod Block Monitor Operability Requirements

✓ 1. Task description and number, JPM description and number are identified

✓ 2. Task elements identified and K/A references are included

✓ 3. Performance location specified

a. in-plant

b. control room

c. simulator

✓ 4. Initial conditions and cues identified

a. setup, required materials, and procedure

b. malfunctions and instructor actions

c. initiating and terminating cues

✓ 5. Task standards identified and verified by SME review

✓ 6. Critical tasks/steps identified meet criteria and identified with a "C"

____ 7. Verify JPM steps fit the most current procedures
Procedure Rev. 223 Date 08/01/98

✓ 8. Pilot test JPM

a. verify cues both verbal and visual are free of conflict

b. ensure performance time is accurate

9. If the JPM cannot be performed as written with proper responses, then revise the JPM

____ 10. When JPM is revalidated, SME/Instructor signs and dates JPM

SME/Instructor Date

SME/Instructor Date

SME/Instructor Date

## SIMULATOR SETUP:

- Set up to IC 20
- At the Vax terminal, insert MFLCPR value of 0.95.
- Go to RUN.
- Obtain an Official Case.
- Verify that a LCRP exists.
- Insert malfunction per table.
- If the PPC does not work, provide the student the attached Official 3D Case.

## EVENT TRIGGERS

None

## MALFUNCTIONS:

| Time | Malfunction No. | Malfunction Title | ET | Delay | F. Sev. | Ramp | I. Sev. |
|---|---|---|---|---|---|---|---|
| | Nm16a | RBM channel A fails INOP | N/A | N/A | 0 | N/A | N/A |

## OVERRIDES:

None

## REMOTE FUNCTIONS:

None

## INSTRUCTOR ACTIONS:

1. Read initial conditions and initiating cues to the operator.

## TASK STANDARDS:

1. Determine that "A" Rod Block Monitor is Inop. (only "A" is Inop, NOT both)
2. Determine that a Limiting Control Rod Pattern does exists.
3. Determines that Technical Specifications requires that the Rod Block Monitor must be returned to operable status within 24 hours.
4. Determines that one channel of Rod Block Monitor must be placed in the TRIPPED condition within 1 hour.

## REQUIRED MATERIALS:

Technical Specifications

## GENERAL REFERENCES:

1C05B, B-6

1C05B, C-6

Technical Specifications

**Read to the operator the following information:**

**INITIAL CONDITIONS:**

1. Annunciators 1C05B, B-6 RBM UPSCALE OR INOP and 1C05B, C-6 RBM DOWNSCALE have just alarmed.

2. The simulator reflects current plant conditions.

**INITIATING CUES:**

1. As the OSS you are to evaluate these plant conditions and determine the Technical Specification requirements for the Rod Block Monitoring System.

**This task is not time critical.**

**Inform the evaluator when you have completed the task.**

## PERFORMANCE INFORMATION

| NOTE: |
|---|
| Critical steps are denoted with a "C". Failure to meet the standard for this step constitutes failure. |

Time Start _____

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: **C** | At Panel 1C05, monitor RBM displays to determine the affected RBM channel. |
| STANDARD: | Determine that "A" Rod Block Monitor is Inop. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: **C** | Determine if the Rod Block Monitor System is required to be operable. |
| STANDARD: | Determine that a Limiting Control Rod Pattern does exists. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: **C** | Determine the Technical Specification requirements for on RBM channel inoperable |
| STANDARD: | Determines that Technical Specifications requires that the Rod Block Monitor must be returned to operable status within 24 hours. |
| COMMENTS: CUE: 24 hours has elapsed and "A" RBM has not been fixed. What are the requirements now? | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: **C** | Determine the Technical Specification requirements for not complying with TS 3.3.2.1.A. |
| STANDARD: | Determines that one channel of Rod Block Monitor must be placed in the TRIPPED condition within 1 hour. |
| COMMENTS: | |

Time Stop _____

**TERMINATING CUES:**

Operability requirements determined.

## VERIFICATION OF COMPLETION

JPM No.: 2.1.33-04 JPM Description: Determine Rod Block Monitor Operability Requirements

Operator: _____ Evaluator: _____

Licensee: ☐ RO ☐ SRO ☐ SRO Cert
☐ STA ☐ NSPEO

Result: ☐ SATISFACTORY ☐ UNSATISFACTORY

**COMMENTS/FEEDBACK:** (Note any trainee discrepancies or misperformed steps.)

_____

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_____

_____ _____
Evaluator's Signature Date

>>>> SIMULATOR <<<<
3D MONICORE
PERIODIC LOG

SEQUENCE NO 12
11-FEB-2001 11:41 CALCULATED
11-FEB-2001 11:41 PRINTED
CASE ID FMLS1010211114147
RESTART FMLS1010211114147
LPRM ABSOLUTE - FULL CORE

CORE PARAMETERS

| | | |
|---|---|---|
| POWER | MWT | 1653. |
| POWER | MWE | 561. |
| FLOW | MLB/HR | 44.775 |
| FPAPDR | | 1.053 |
| SUBC | BTU/LB | 21.82 |
| PR | PSIa | 1022.1 |
| CORE | MWD/sT | 16353.6 |
| CYCLE | MWD/sT | 4163.6 |
| MCPR | | 1.316 |

CALC RESULTS

| | |
|---|---|
| Keff | 1.0000 |
| XE WORTH % | -2.41 |
| XE/RATED | 1.00 |

LOAD LINE SUMMARY

| | |
|---|---|
| CORE POWER | 99.7% |
| CORE FLOW | 91.4% |
| LOAD LINE | 104.4% |

CORRECTION FACTOR: MFLCPR= 1.000 MFLPD= 1.000 MAPRAT= 1.000
OPTION: ARTS DUAL LOOP MANUAL FLOW MCPRLIM= 1.400

MOST LIMITING LOCATIONS (NON-SYMMETRIC)

| MFLCPR | LOC | MFLPD | LOC | MAPRAT | LOC | PCRAT | LOC |
|---|---|---|---|---|---|---|---|
| 0.950 | 37-28 | 0.883 | 7-28- 8 | 0.931 | 35-28- 8 | 0.907 | 7-18- 8 |
| 0.940 | 7-28 | 0.874 | 7-18- 8 | 0.923 | 35-18- 8 | 0.898 | 7-28- 8 |
| 0.930 | 7-18 | 0.865 | 37-28- 8 | 0.914 | 9-18- 8 | 0.889 | 9-30- 8 |
| 0.920 | 37-18 | 0.847 | 9-30- 8 | 0.905 | 9-28- 8 | 0.876 | 37-28- 8 |
| 0.886 | 9-30 | 0.838 | 35-16- 8 | 0.857 | 37-18- 8 | 0.848 | 9-16- 8 |
| 0.876 | 35-30 | 0.829 | 9-16- 8 | 0.848 | 7-28- 8 | 0.839 | 35-16- 8 |
| 0.866 | 9-16 | 0.821 | 35-30- 8 | 0.839 | 7-18- 8 | 0.830 | 37-16- 9 |
| 0.841 | 19-32 | 0.645 | 37-16- 9 | 0.830 | 37-28- 8 | 0.737 | 35-30- 8 |
| 0.831 | 25-32 | 0.636 | 7-30- 9 | 0.815 | 35-16- 8 | 0.726 | 37-30- 9 |
| 0.821 | 25-14 | 0.627 | 37-30- 9 | 0.806 | 35-30- 8 | 0.717 | 7-30- 9 |

SEQ. A-1 C=MFLCPR D=MFLPD M=MAPRAT P=PCRAT *=MULTIPLE

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 43 | | | | | | | | | | |
| L | | | | | | | | | | |
| 39 | | | | | | | | | | |
| 35 | | | | 36 | | 36 | | | | |
| L | | | | | | | | | | |
| 31 | | | | | | | | | | |
| 27 | | D | 36 | 00 | | 00 | | 36MC | | |
| L | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 19 | | P | 36 | 00 | | 00 | | 36 | | |
| L | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 11 | | | | 36 | | 36 | | | | |
| L | | | | | | | | | | |
| 07 | | | | | | | | | | |
| 03 | | L | | L | | L | | L | | L |
| | 02 | | 06 | | 10 | | 14 | | 18 | |
| | | | | | | | | | | |
| | 22 | | 26 | | 30 | | 34 | | 38 | |
| | | | | | | | | | | |
| | 42 | | | | | | | | | |

CORE AVE AXIAL

| NOTCH | REL PW | LOC |
|---|---|---|
| | 0.311 | 25 |
| 00 | 0.621 | 24 |
| 02 | 0.753 | 23 |
| 04 | 0.885 | 22 |
| 06 | 0.936 | 21 |
| 08 | 0.987 | 20 |
| 10 | 0.988 | 19 |
| 12 | 0.990 | 18 |
| 14 | 1.013 | 17 |
| 16 | 1.036 | 16 |
| 18 | 1.039 | 15 |
| 20 | 1.042 | 14 |
| 22 | 1.065 | 13 |
| 24 | 1.089 | 12 |
| 26 | 1.112 | 11 |
| 28 | 1.134 | 10 |
| 30 | 1.174 | 09 |
| 32 | 1.214 | 08 |
| 34 | 1.232 | 07 |
| 36 | 1.250 | 06 |
| 38 | 1.211 | 05 |
| 40 | 1.171 | 04 |
| 42 | 0.875 | 03 |
| 44 | 0.580 | 02 |
| 46 | 0.290 | 01 |

CORE AVERAGE RADIAL POWER DISTRIBUTION

| RING # | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| REL PW | 1.129 | 1.060 | 1.222 | 1.165 | 1.132 | 0.687 |

>>>> SIMULATOR <<<< INSTRUMENT READINGS/STATUS
CALIBRATED LPRM READINGS

SEQUENCE NO 12
11-FEB-2001 11:41 CALCULATED
11-FEB-2001 11:41 PRINTED
CASE ID FMLS1010211114147
LPRM ABSOLUTE - FULL CORE

| | | | | | |
|---|---|---|---|---|---|
| 41D | | 20.9 | 28.5 | | |
| C | | 24.9 | 33.9 | | |
| B | | 25.3 | 34.6 | | |
| A | | 28.3 | 38.7 | | |
| 33D | 28.5 | 33.3 | 35.3 | 32.8C | |
| C | 33.9 | 42.8 | 45.8 | 39.9 | |
| B | 34.6 | 45.3 | 48.9 | 41.8 | |
| A | 38.7D | 45.4 | 47.6 | 43.2M | |
| 25D | 31.2 | 34.8 | 34.3 | 35.3 | 0.0 |
| C | 39.9 | 42.6 | 41.5 | 45.8 | 33.9 |
| B | 41.8 | 45.0 | 43.4 | 48.9 | 34.6 |
| A | 43.2P | 41.1 | 36.9 | 47.6 | 38.7 |
| 17D | 29.2 | 35.1 | 34.8 | 33.3 | 20.9 |
| C | 36.9 | 43.0 | 42.6 | 42.8 | 24.9 |
| B | 38.2 | 45.8 | 45.0 | 45.3 | 25.3 |
| A | 40.9 | 43.2 | 41.1 | 45.4 | 28.3 |
| 09D | 20.9 | 29.2 | 31.3 | 28.5 | |
| C | 24.9 | 36.9 | 39.9 | 33.9 | |
| B | 25.3 | 38.2 | 41.8 | 34.6 | |
| A | 28.3 | 40.9 | 43.2 | 38.7 | |
| | 08 | 16 | 24 | 32 | 40 |

# OF TIPS REJECTED: 2

FAILED SENSORS:
LPRM ( SIGNAL FAILED)
LPRM ( 1 PANACEA REJECTED)
4025D
OTHER SENSORS ( 0 TOTAL)
SUB RODS
NONE

T = TIP RUN RECOMMENDED
C = MFLCPR LOCATION
M = MAPRAT LOCATION
D = MFLPD LOCATION
P = PCRAT LOCATION
* = MULTIPLE LIMIT

CORE SUMMARY

| | | | | | |
|---|---|---|---|---|---|
| CORE POWER | 99.7% | CALC SUB FLOW | 91.2% | DP MEAS PSI | 20.63 |
| CORE FLOW | 91.4% | OPER SUB FLOW | -2.0% | DP CALC PSI | 24.77 |
| LOAD LINE | 4% | FLOW BASIS | MEAS | FEEDWTR FLOW MLB/HR | 7.11 |

APRM CALIBRATION

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| READING | 100.8 | 100.0 | 100.5 | 100.4 | 99.4 | 100.3 |
| AGAF | 0.990 | 0.997 | 0.993 | 0.993 | 1.003 | 0.993 |
| APRM - %CTP | 1.1 | 0.3 | 0.8 | 0.7 | -0.2 | 0.7 |

TIP RUNS RECOMMENDED
STRINGS: NONE

**RBM**
**UPSCALE OR INOP**

TITLE: ROD BLOCK MONITOR UPSCALE/INOPERATIVE

**NOTE**

- This alarm may occur during the continuous insertion of a non-edge control rod from the full out or nearly full out position.
- A 6 second time delay exists prior to activation of this annunciator.

1.0 PROBABLE CAUSE(S) / INITIATING DEVICE(S) / SETPOINT(S)

| | | | |
|---|---|---|---|
| 1.1 | a. RBM Channel A upscale | Relay C51B-K4 Via K1 | 30% ≤ APRM ≤ 65%, UPSCALE trip is 115% RBM Signal.<br>65% ≤ APRM ≤ 85%, UPSCALE trip is 109% RBM Signal.<br>85% ≤ APRM, UPSCALE trip is 105% RBM Signal. |
| | b. RBM Channel A inoperative | Relay C51B-K6 Via K5 | > 50% LPRM inputs for the selected rod are bypassed, MODE SWITCH not in OPERATE, module unplugged, nulling sequence incomplete, RBM self check failure, multiple rods selected, loss of RBM power supply |

1.0 PROBABLE CAUSE(S) / INITIATING DEVICE(S) / SETPOINT(S)
(Continued)

| | | | |
|---|---|---|---|
| 1.2 a. | RBM Channel B upscale | Relay C51B-K4 Via K1 | 30% ≤ APRM ≤ 65%, UPSCALE trip is 115% RBM Signal.<br>65% ≤ APRM ≤ 85%, UPSCALE trip is 109% RBM Signal.<br>85% ≤ APRM, UPSCALE trip is 105% RBM Signal. |
| b. | RBM Channel B inoperative | Relay C51B-K6 Via K3 | > 50% LPRM inputs for the selected rod are bypassed, MODE SWITCH not in OPERATE, module unplugged, nulling sequence incomplete, RBM self check failure, multiple rods selected, loss of RBM power supply |

2.0 AUTOMATIC ACTIONS

2.1 If RBM is UPSCALE when Reactor power is > 30%, a rod withdraw block occurs.

2.2 If Reactor power is < 30%, RBM is automatically bypassed.

## 3.0 OPERATOR ACTIONS

**NOTE**

Because the function of the RBM is to initiate a rod block to prevent a violation of the MCPR limit during the WITHDRAWAL of a single control rod, rod INSERTION may be performed without first resetting the withdrawal block.

When performing single notch withdrawals such as those associated with the control rod exercise surveillance, the withdrawal block may be reset without first executing a 3D Monicore case.

3.1 At Panel 1C-05, monitor RBM displays to determine the affected RBM channel.

3.2 If UPSCALE light is ON and has not been anticipated as part of a sequence exchange:

a. Verify with the Reactor Engineer that the proper rod withdrawal sequence is being used.

b. Verify the proper rod is selected.

c. Run an OFFICIAL 3D CASE and follow with one of the below options:

1) If a thermal limit has value in excess of 1.000, inform the OSS and comply with the Technical Specification requirements for Power Distribution Limits and the Technical Requirements Manual requirements for LHGR.

2) If no thermal limits are in excess of 1.000, but are in excess of administrative limits, inform the OSS.

3) If thermal limits are not in excess of administrative limits, deselect and reselect the rod to clear the upscale alarm light.

a) After each subsequent upscale alarm on the same rod or on a rod in a symmetric location at the same notch position, the Reactor Engineer and OSS should confer on whether an OFFICIAL 3D CASE is necessary prior to clearing the upscale.

(continued)

3.0 OPERATOR ACTIONS (Continued)

3.3 If UPSCALE light is ON and has been anticipated as part of a sequence exchange (single rod steps where a rod is being moved from FULL IN to FULL OUT by notch withdrawl):

a. Verify with the Reactor Engineer that core thermal parameters are expected to remain within limits during continued movement of this rod.

b. With the concurrence of the OSS/OSM, deselect and reselect the rod to clear the upscale alarm and rod block.

c. Continue through the end of the current rod movement step (for further UPSCALE alarms, additional deslection/reselections may be done at the discretion of the OSS/OSM).

d. After the rod is FULL OUT, run an OFFICAL 3D CASE.

4.0 SUPPLEMENTAL ACTIONS

4.1 If the cause of the alarm was due to a failed sensor/logic channel, initiate a Work Request Card to have that sensor/logic channel checked/repaired and comply with Technical Specification requirements of Control Rod Block Instrumentation.

5.0 REFERENCES

5.1 APED-C11-024 <6>

5.2 APED-C51-027 <33,38,39,47>

5.3 DAEC Technical Specifications

5.4 DAEC Technical Requirements Manual

5.5 DCP 1306, DCP 1451, DCP 1493

5.6 MM 134

5.7 GEK-97234, 3D Monicore System

5.8 Tech. Spec. Amendment 193

5.9 NEDC-30813-P, ARTS Program for the DAEC

5.10 ECP 1577

5.11 AR 21365

**RBM**
**DOWNSCALE**

TITLE: ROD BLOCK MONITOR DOWNSCALE

**NOTE**

A 6 second time delay exists prior to activation of this annunciator.

1.0 PROBABLE CAUSE(S) / INITIATING DEVICE(S) / SETPOINT(S)

| | | | |
|---|---|---|---|
| 1.1 | RBM Channel A Downscale Rod Block Ckt. A tripped. | Relay C51B-K5 via K1 | 94/125 of scale (dec.) |
| 1.2 | RBM Channel B Downscale Rod Block Ckt. B. tripped. | Relay C51B-K5 via K2 | 94/125 of scale (dec.) |

2.0 AUTOMATIC ACTIONS

2.1 If Reactor power is 30%, a rod withdrawal block occurs.

2.2 If Reactor power is < 30%, no AUTOMATIC ACTIONS occur.

3.0 OPERATOR ACTIONS

3.1 At Panel 1C-05, monitor RBM displays to determine the affected RBM Channel.

3.2 If inoperative, monitor Panel 1C-37 to see if a malfunction is indicated.

**CAUTION**

Do not bypass a RBM Channel without permission from Shift Supervisor.

3.3 Consider bypassing the affected RBM Channel if allowable and comply with Technical Specification requirements for Control Rod Block Instrumentation.

## 4.0 SUPPLEMENTAL ACTIONS

4.1 If the cause of the alarm was due to a failed sensor/logic channel; initiate a MAR to have that sensor/logic channel checked/repaired and comply with Technical Specification requirements for Control Rod Block Instrumentation.

## 5.0 REFERENCES

5.1 APED-C11-024 <6>

5.2 APED-C51-027 <33,38,47>

5.3 DAEC Technical Specifications

5.4 DCP 1306, DCP 1451, DCP 1493

5.5 Tech. Spec. Amendment 193

## 3.3 INSTRUMENTATION

### 3.3.2.1 Control Rod Block Instrumentation

LCO 3.3.2.1 The control rod block instrumentation for each Function in Table 3.3.2.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2.1-1.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One Rod Block Monitor (RBM) channel inoperable. | A.1 Restore RBM channel to OPERABLE status. | 24 hours |
| B. Required Action and associated Completion Time of Condition A not met.<br><br>OR<br><br>Two RBM channels inoperable. | B.1 Place one RBM channel in trip. | 1 hour |
| C. Rod Worth Minimizer (RWM) inoperable during reactor startup. | C.1 Suspend control rod movement except by scram.<br><br>OR | Immediately<br><br>(continued) |

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. (continued) | C.2.1.1 Verify ≥ 12 rods withdrawn.<br><br>OR<br><br>C.2.1.2 Verify by administrative methods that startup with RWM inoperable has not been performed in the last calendar year.<br><br>AND<br><br>C.2.2 Verify movement of control rods is in compliance with Banked Position Withdrawal Sequence (BPWS) by a second licensed operator or other qualified member of the technical staff. | Immediately<br><br><br><br>Immediately<br><br><br><br><br><br><br>During control rod movement |
| D. RWM inoperable during reactor shutdown. | D.1 Verify movement of control rods is in compliance with BPWS by a second licensed operator or other qualified member of the technical staff. | During control rod movement |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. One or more Reactor Mode Switch – Shutdown Position channels inoperable. | E.1 Suspend control rod withdrawal. | Immediately |
| | AND | |
| | E.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.

2. When an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

---

| SURVEILLANCE | FREQUENCY |
|---|---|
| SR 3.3.2.1.1 Perform CHANNEL FUNCTIONAL TEST. | 92 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.2.1.2 | ----------NOTE----------<br>Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.2.1.3 | ----------NOTE----------<br>Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.2.1.4 | ----------NOTE----------<br>Neutron detectors are excluded.<br>----------<br><br>Verify the RBM:<br><br>a. Low Power Range – Upscale Function is not bypassed when THERMAL POWER is ≥ 29% and < 64% RTP.<br><br>b. Intermediate Power Range – Upscale Function is not bypassed when THERMAL POWER is ≥ 64% and < 84% RTP.<br><br>c. High Power Range – Upscale Function is not bypassed when THERMAL POWER is ≥ 84% RTP. | 184 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.2.1.5 | ----------NOTE----------<br>Neutron detectors are excluded.<br>----------<br><br>Perform CHANNEL CALIBRATION. | 184 days |
| SR 3.3.2.1.6 | ----------NOTE----------<br>Not required to be performed until 1 hour after reactor mode switch is in the shutdown position.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST. | 24 months |
| SR 3.3.2.1.7 | Verify control rod sequences input to the RWM are in conformance with BPWS. | Prior to declaring RWM OPERABLE following loading of sequence into RWM |

Table 3.3.2.1-1 (page 1 of 1)
Control Rod Block Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENTS | ALLOWABLE VALUE |
|---|---|---|---|---|
| 1. Rod Block Monitor | | | | |
| a. Low Power Range - Upscale | (a) | 2 | SR 3.3.2.1.1<br>SR 3.3.2.1.4<br>SR 3.3.2.1.5 | ≤ 115.5/125 divisions of full scale |
| b. Intermediate Power Range - Upscale | (b) | 2 | SR 3.3.2.1.1<br>SR 3.3.2.1.4<br>SR 3.3.2.1.5 | ≤ 109.7/125 divisions of full scale |
| c. High Power Range - Upscale | (c),(d) | 2 | SR 3.3.2.1.1<br>SR 3.3.2.1.4<br>SR 3.3.2.1.5 | ≤ 105.9/125 divisions of full scale |
| d. Inop | (d),(e) | 2 | SR 3.3.2.1.1 | NA |
| e. Downscale | (d),(e) | 2 | SR 3.3.2.1.1<br>SR 3.3.2.1.5 | NA |
| f. Bypass Time Delay | (d),(e) | 2 | SR 3.3.2.1.1<br>SR 3.3.2.1.5 | ≤ 2.0 seconds |
| 2. Rod Worth Minimizer | 1(f),2(f) | 1 | SR 3.3.2.1.2<br>SR 3.3.2.1.3<br>SR 3.3.2.1.7 | NA |
| 3. Reactor Mode Switch - Shutdown Position | (g) | 2 | SR 3.3.2.1.6 | NA |

(a) THERMAL POWER ≥ 30% and < 65% RTP and MCPR < 1.70.

(b) THERMAL POWER ≥ 65% and < 85% RTP and MCPR < 1.70.

(c) THERMAL POWER ≥ 85% and < 90% RTP and MCPR < 1.70.

(d) THERMAL POWER ≥ 90% RTP and MCPR < 1.40.

(e) THERMAL POWER ≥ 30% and < 90% RTP and MCPR < 1.70.

(f) With THERMAL POWER ≤ 10% RTP.

(g) Reactor mode switch in the shutdown position.

# *DUANE ARNOLD ENERGY CENTER*

## JOB PERFORMANCE MEASURE

**NUMBER: 2.4.3-01**

**TASK NUMBER: 86.00**

**TITLE: Function as the Back Panel Communicator**

**Rev. 0**

| | | |
|---|---|---|
| DEVELOPED BY: | Instructor | 2/5/2001<br>Date |
| VALIDATED BY: | SME/Instructor | 2/11/2001<br>Date |
| REVIEWED BY: | Plant Reviewer | 2-11-2001<br>Date |
| APPROVED BY: | Training Supervisor-Operations | 2/13/01<br>Date |

# DUANE ARNOLD ENERGY CENTER

## JOB PERFORMANCE MEASURE

| | | |
|---|---|---|
| **JPM No.** 2.4.3-01 | **JPM Description:** Function as the Back Panel Communicator | |
| **Task No.** 86.00 | **Task Description:** Monitor the Area Radiation Monitoring System | |
| **K/A Reference:** 2.4.3 | 3.5/3.8 | |
| APPLICABLE METHOD OF TESTING: | | |
| Simulate Performance | Actual Performance X | |
| Simulator X | In-Plant | Control Room |
| Time for Completion: 20 minutes | | |

# JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

**NOTE**

All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 7 through 10.

JPM No. 2.4.3-01 JPM Title Function as the Back Panel Communicator

1. Task description and number, JPM description and number are identified
2. Task elements identified and K/A references are included
3. Performance location specified
   a. in-plant
   b. control room
   c. simulator
4. Initial conditions and cues identified
   a. setup, required materials, and procedure
   b. malfunctions and instructor actions
   c. initiating and terminating cues
5. Task standards identified and verified by SME review
6. Critical tasks/steps identified meet criteria and identified with a "C"
7. Verify JPM steps fit the most current procedures
   Procedure Rev. 0 Date 1/16/98
8. Pilot test JPM
   a. verify cues both verbal and visual are free of conflict
   b. ensure performance time is accurate
9. If the JPM cannot be performed as written with proper responses, then revise the JPM
10. When JPM is revalidated, SME/Instructor signs and dates JPM

SME/Instructor _____ Date _____

SME/Instructor _____ Date _____

SME/Instructor _____ Date _____

**SIMULATOR SETUP:**
Place the simulator in a stable post-LOCA condition.
Insert an override for the RWCU Pump Room ARM to read 1000 mrem/hr.

**EVENT TRIGGERS**

None

**MALFUNCTIONS:**

None

**OVERRIDES:**

RM01RE9156

**REMOTE FUNCTIONS:**

None

**INSTRUCTOR ACTIONS:**

1. Read initial conditions and initiating cues to the operator.

**TASK STANDARDS:**

1. Complete form CR-03 of EPIPs.
2. Detect and notify the OSS of elevated reading on the RWCU Pump Room ARM.

**REQUIRED MATERIALS:**

EPIP forms:

1. CR-02, "Back Panel Communicator Checklist"
2. CR-03, "Dose Projection & ARM Data Sheet"

**GENERAL REFERENCES:**

EPIP 2.5, Rev. 13, 9/30/98

**Read to the operator the following information:**

**INITIAL CONDITIONS:**

1. The plant status is as you see it.
2. You were in the plant when an emergency occurred and have just reported to the Control Room for accountability.
3. The TSC and OSC are in the process of being staffed.
4. The Back Panel Communicator has not yet reported to the Control Room.

**INITIATING CUES:**

The Shift Manager directs you to function as Back Panel Communicator and complete EPIP forms CR-02 and CR-03. Perform only the OPERATION Section of CR-02.

**This task is not time critical.**

**Inform the evaluator when you have completed the task.**

NOTE to Evaluator: Give the operator EPIP forms CR-02 and CR-03.

## PERFORMANCE INFORMATION

| NOTE: |
|---|
| Critical steps are denoted with a "C". Failure to meet the standard for this step constitutes failure. |

Time Start _____

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: | Activate the Back Panel Communicator position. |
| STANDARD: | Report to the TSC.<br>Swipe in the Emergency accountability card reader.<br>Locate the Back Panel Communicator Handbook and Checklist.<br>Report to the Control Room.<br>Inform the OSM of arrival. |
| COMMENTS: Note: These steps are N/A. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: | Initiate communications with the TSC using the Phone mounted on 1C22. |
| STANDARD: | Communications initiated. |
| COMMENTS: Cue Respond as Rad Support Staff in the TSC that communications are satisfactory. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Obtain an initial set of readings on Form CR-03, "Dose Projection and ARM Data Sheet" and report them to Rad Support Staff person in the TSC. |
| STANDARD: | Initial set of readings taken on CR-03 and communicated to the TSC:<br>ARM readings from 1C11<br>Drywell/Torus Monitor readings from 1C09<br>KAMAN effluent readings from PPC<br>Met data from SPMET or Met recorder at 1C22 |
| COMMENTS: Verify each reading on form CR-03 as the candidate records it; they are too numerous to detail here. Use a provided copy of CR-03.<br>The student may inform the Shift Manager immediately upon discovery of the alarming ARM or continue to obtain readings. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Recognize elevated reading on the RWCU Pump Room ARM and report the reading to the Shift Manager. |
| STANDARD: | Report made to the Shift Manager that the RWCU Pump Room ARM is reading 1000 mrem/hr. |
| COMMENTS: Acknowledge the elevated ARM reading and provide the terminating cue. | |

Time Stop _____

**TERMINATING CUES:** The Back Panel Communicator has just reported and will assume the position.

## VERIFICATION OF COMPLETION

JPM No.: 2.4.3-01 JPM Description: Function as the Back Panel Communicator

Operator: _____ Evaluator: _____

Licensee: ☐ RO ☐ SRO ☐ SRO Cert
☐ STA ☐ NSPEO

Result: ☐ SATISFACTORY ☐ UNSATISFACTORY

**COMMENTS/FEEDBACK:** (Note any trainee discrepancies or misperformed steps.)

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_____ _____
Evaluator's Signature Date

# BACK PANEL COMMUNICATOR CHECKLIST

## CONTROL ROOM ACTIVATION

____ Report to the TSC.

____ Swipe in the emergency accountability card reader, sign in on the Emergency Assignment Staffing Board, acquire the Back Panel Communicator badge.

## CONTROL ROOM STAFFING

____ Locate and utilize the Back Panel Communicator handbook and checklist.

____ Report to the Control Room

____ Inform the Operations Shift Manager of your arrival.

## OPERATION

____ Verify communications with Radiological Support Staff. The Back Panel Communicator must initiate communications with the TSC utilizing the back direct ring down phone mounted on the side of panel 1C22.

____ Obtain an initial set of readings identified on Form CR-03, "Dose Projection and ARM Data Sheet," upon arriving at the Control Room and report them to the Rad Support Staff person in the TSC

____ Continuously update the TSC with the most current ARM data obtained, at least every 15 minutes.

____ Continuously monitor data for trends or changes.

____ Alarming ARM data should be provided to the Operations Shift Manager for evaluation.

____ Notify the SRPC immediately of any changes in ARM data.

____ Notify the HP Supervisor immediately of any changes in ARM data.

____ Assist the TSC MIDAS Operator with any dose projection operations.

## RECOVERY

## DOSE PROJECTI ARM DATA SHEET



| MONITOR # | MONITOR LOCATION | UNITS | ALARM LEVEL | MAX NORM | MAX SAFE | TIME :00 | TIME :15 | TIME :30 | TIME :45 |
|---|---|---|---|---|---|---|---|---|---|
| RT-9180 | RB 747' WASTE COLL. | mR/hr | 250.0 | | | | | | |
| RT-9166 | RB 716' SW, RW PUMP ROOM | mR/hr | 50.0 | | | | | | |
| RT-9178 | RB 855' SPENT FUEL STORAGE AREA | mR/hr | 19.0 | 100 | 1000 | | | | |
| RT-9163 | REFUEL FLOOR NORTH | mR/hr | 10.0 | 10 | 100 | | | | |
| RT-9176 | RB 757' TIP | mR/hr | 100.0 | 60 | 600 | | | | |
| RT-9170 | CRD REPAIR ROOM | mR/hr | 22.0 | 15 | 150 | | | | |
| RT-9167 | RB 757' RR ACCESS | mR/hr | 12.0 | 10 | 100 | | | | |
| RT-9162 | CONTROL ROOM | mR/hr | 3.0 | | | | | | |
| RT-9173 | RB 786' RESIN HANDLING | mR/hr | 80.0 | 100 | 1000 | | | | |
| RT-9177 | RB 786' CU PH. SEPARATOR | mR/hr | 100.0 | 20 | 200 | | | | |
| RT-9155 | RB 812' JUNGLE ROOM, C/U DEMIN AREA | mR/hr | 2500.0 | 60 | 600 | | | | |
| RT-9156 | RB 786' RWCU PUMP ROOM | mR/hr | 1000.0 | 1000 | 10000 | | | | |
| RT-9157 | RB 786' RWCU HEAT EXCH. | mR/hr | 2000.0 | 1000 | 10000 | | | | |
| RT-9171 | RB 812' VENTILATION EQUIP. | mR/hr | 2.2 | 60 | 600 | | | | |
| RT-9153 | Rx B 855 NEW FUEL STORAGE AREA | mR/hr | 10.0 | 10 | 100 | | | | |
| RT-9168 | RB 757' CRD NORTH | mR/hr | 10.0 | 10 | 100 | | | | |
| RT-9175 | RB 833' COND. PH. SEPARATOR TANK | mR/hr | 150.0 | | | | | | |
| RT-9169 | RB 757' CRD SOUTH | mR/hr | 10.0 | 10 | 100 | | | | |
| RT-9164 | REFUEL FLOOR SOUTH | mR/hr | 20.0 | 10 | 100 | | | | |
| RT-9159 | TB 734' FEED PUMP AREA | mR/hr | 2.3 | | | | | | |
| RT-9158 | TB 734' COND. PUMP AREA | mR/hr | 5.0 | | | | | | |
| RT-9160 | TB 734' LUBE OIL AREA | mR/hr | 10.0 | | | | | | |
| RT-9174 | TB 734' SUMP AREA | mR/hr | 2.5 | | | | | | |
| RT-9172 | HOT LAB | mR/hr | 2.5 | | | | | | |
| RT-9179 | TB 780' TURBINE FRONT STANDARD | mR/hr | 25.0 | | | | | | |
| RT-9161 | MACHINE SHOP | mR/hr | 5.0 | | | | | | |
| RT-9151 | RW CONTROL ROOM | mR/hr | 2.7 | | | | | | |
| RT-9152 | RW 786' RW, SAMPLE TANK CORRIDOR | mR/hr | 20.0 | | | | | | |
| RT-9154 | RW 757' RW, DRUMMING AREA | mR/hr | 15.0 | | | | | | |
| RT-9165 | ACCESS CONTROL | mR/hr | 2.5 | | | | | | |

# *DUANE ARNOLD ENERGY CENTER*

## JOB PERFORMANCE MEASURE

**NUMBER: 2.3.1-04**

**TASK NUMBER: NONE**

**TITLE: Gain Access to a High Radiation Area**

**Rev. 0**

| | | |
|---|---|---|
| DEVELOPED BY: | Instructor | 2-5-01<br>Date |
| VALIDATED BY: | SME/Instructor | 2/5/2001<br>Date |
| REVIEWED BY: | Plant Reviewer | 2-11-01<br>Date |
| APPROVED BY: | Training Supervisor-Operations | 2/13/01<br>Date |

# DUANE ARNOLD ENERGY CENTER

## JOB PERFORMANCE MEASURE

| | | | |
|---|---|---|---|
| **JPM No.** 2.3.1-04 | **JPM Description:** Gain access to a high radiation area | | |
| **Task No.** None | **Task Description:** None | | |
| **K/A Reference:** 2.3.1 | 2.6/3.6 | | |
| APPLICABLE METHOD OF TESTING: RO/SRO | | | |
| Simulate Performance | X | Actual Performance | |
| Simulator | In-Plant | X | Control Room |
| Time for Completion: 30 minutes | | | |

# JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

**NOTE**

All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 7 through 10.

JPM No. 2.4.1-04 JPM Title Gain access to a high radiation area

✓ 1. Task description and number, JPM description and number are identified

✓ 2. Task elements identified and K/A references are included

✓ 3. Performance location specified

   a. in-plant

   b. control room

   c. simulator

✓ 4. Initial conditions and cues identified

   a. setup, required materials, and procedure

   b. malfunctions and instructor actions

   c. initiating and terminating cues

✓ 5. Task standards identified and verified by SME review

✓ 6. Critical tasks/steps identified meet criteria and identified with a "C"

✓ 7. Verify JPM steps fit the most current procedures
Procedure Rev. 9 Date 6/28/00

✓ 8. Pilot test JPM

   a. verify cues both verbal and visual are free of conflict

   b. ensure performance time is accurate

9. If the JPM cannot be performed as written with proper responses, then revise the JPM

____ 10. When JPM is revalidated, SME/Instructor signs and dates JPM

SME/Instructor Date

SME/Instructor Date

SME/Instructor Date

**SIMULATOR SETUP:**

NONE

**EVENT TRIGGERS:**

NONE

**MALFUNCTIONS:**

NONE

**OVERRIDES:**

NONE

**REMOTE FUNCTIONS:**

NONE

## INSTRUCTOR ACTIONS:

1. Verify that the CAVs area is currently posted as a High Rad Area.
2. Start this JPM in the Reactor Building.
3. Read initial conditions and initiating cues to the operator.

## TASK STANDARDS:

1. Operator does not attempt to enter the High Rad Area improperly.
2. The need to sign in on another RWP (which will allow entry) is identified.
3. Current survey map reviewed.
4. HP briefing requested.

## REQUIRED MATERIALS:

RWP 10, Job Step 2
RWP 10, Job Step 6
RWP 33, Job Step 1
Marked-up copy of P&ID Bech-M189<3>
Digital picture of the CAVs area
CAVs Area Survey Map

## GENERAL REFERENCES:

ACP 1411.22, Control of Access to Radiological Areas

**Read to the operator the following information:**

**NOTE:**
**Start this JPM in the Reactor Building.**

**INITIAL CONDITIONS:**

1. The plant is in normal full power operation.
2. Assume you are a (Senior) Reactor Operator in the Reactor Building doing maintenance planning.
3. You are to demonstrate the proper verification techniques while performing this JPM.

**INITIATING CUES:**

As Shift Supervisor, I direct you to go to the CAVs Area and verify the out-of-service CAV vessel 1T-415A isolation valves V-89-150, V-89-151, V-89-154, V-89-155 are closed, bypass valve V-89-153 and drain valve V-89-152 are open.

**This task is not time critical.**

**Inform the evaluator when you have completed the task.**

## PERFORMANCE INFORMATION

NOTE:

Critical steps are denoted with a "C". Failure to meet the standard for this step constitutes failure.

Time Start _____

CAUTION

DO NOT allow the examinee to cross the roped-off boundary of the High Rad Area. Use physical restraint if necessary. If an improper entry is attempted, the JPM will have been performed unsatisfactorily and should be ended by reading the Terminating Cue.

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Operator identifies the need to enter a High Rad area. |
| STANDARD: | Operator does not attempt to enter the High Rad Area improperly. |
| COMMENTS:<br>The examinee need not enter the Reactor Building 786' level area if he recognizes that the CAV vessel valves are in a High Rad Area and begins to work on gaining access.<br><br>(After the need to enter a High Rad Area is identified),<br>CUE:<br>The intent of this JPM is to demonstrate the actions necessary to enter a High Rad Area. An actual entry will not be performed but you are to continue to walkthrough your actions as if it were. I will role play plant support personnel as necessary. | |

Note:

Do not allow the on-shift HPs to become involved with this JPM other than to provide the book of survey maps.

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Operator returns to Access Control to review and identify an RWP which will allow entry. |
| STANDARD: | The need to sign in on another RWP (which will allow entry) is identified. |
| COMMENTS:<br>The correct RWP for operations duties in HRA/LHRA areas is RWP 10, Job Step 6.<br><br>Role Play the On-Shift Health Physics Technician (HP) as necessary. It is preferable for the candidate to identify the correct RWP but this information may be given by the HP/evaluator upon request. | |

| PERFORMANCE STEP:<br>Critical: C | Review a current survey for specific locations of high dose and low dose standby areas. |
|---|---|
| STANDARD: | Current survey map reviewed. |
| COMMENTS:<br><br>(If not stated in the review of the survey map)<br>CUE:<br>Identify the maximum dose rates in the CAVs area. ( ≈80 to 100 mR/hr.) | |

| PERFORMANCE STEP:<br>Critical: C | Request a pre-job briefing by the HP. |
|---|---|
| STANDARD: | HP briefing requested. |
| COMMENTS:<br>CUE/ Role Play as HP:<br>Ask what the specific task is.<br>Verify that a contaminated system will not be opened.<br>Recommend work gloves worn over rubber gloves when operating potential high temperature equipment in the CAVs system.<br>Provide a dose rate instrument.<br>Verify that the operator has a Electronic Dosimetry (ED).<br>Encourage worker to use low dose standby areas outside the CAVs area. | |

Note:

The operator should have already demonstrated the ability to sign in on a RWP, so signing in on the new RWP is not necessary.

Time Stop _____

**TERMINATING CUES:** The intent of this JPM was to demonstrate the actions necessary to enter a High Rad Area. This JPM is complete.

## VERIFICATION OF COMPLETION

JPM No.: 2.3.1-04 JPM Description: Gain access to a high radiation area

Operator: _____ Evaluator: _____

Licensee: ☐ RO ☐ SRO ☐ SRO Cert
☐ STA ☐ NSPEO

Result: ☐ SATISFACTORY ☐ UNSATISFACTORY

**COMMENTS/FEEDBACK:** (Note any trainee discrepancies or misperformed steps.)

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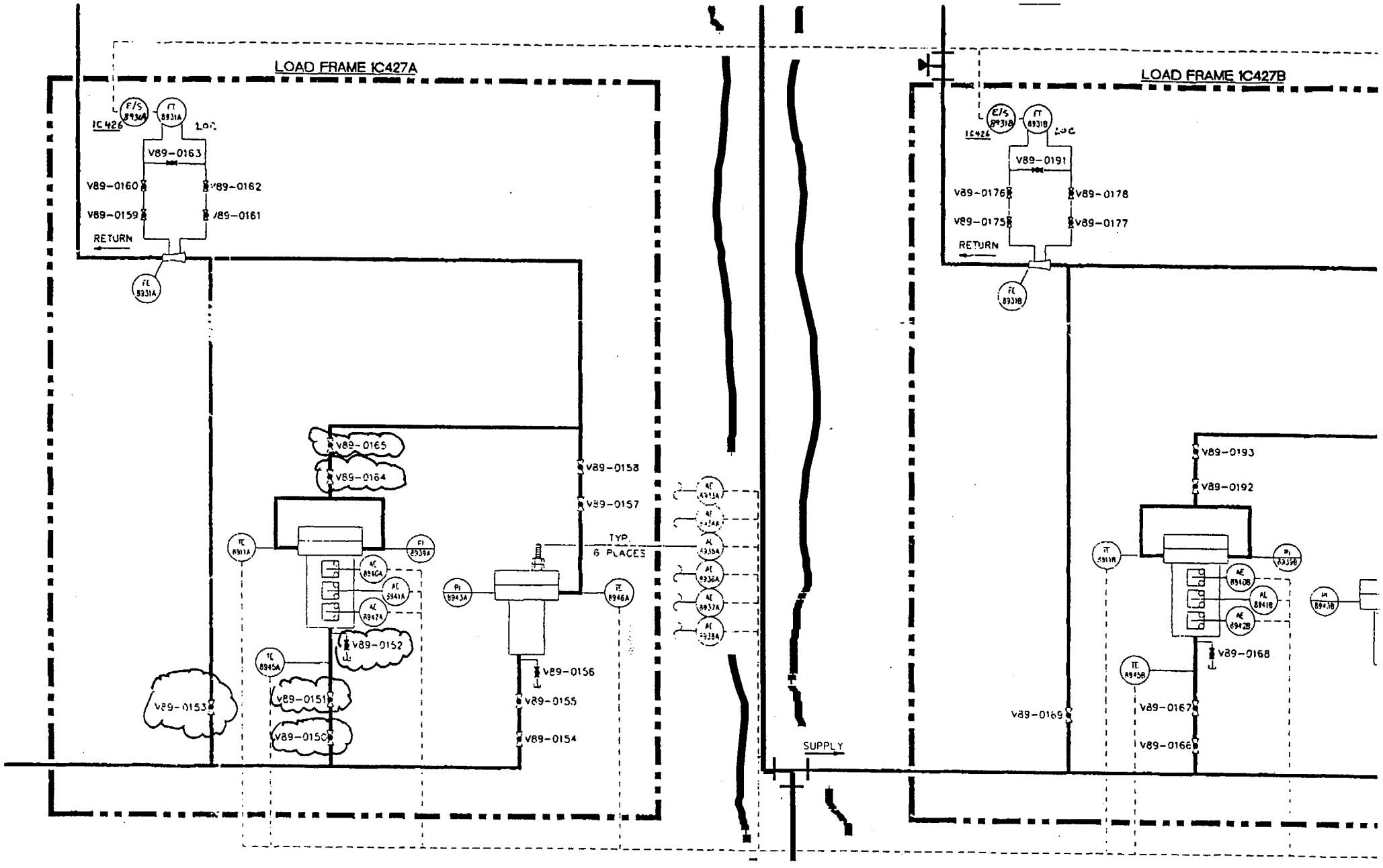
_____ _____
Evaluator's Signature Date


LOAD FRAME 1C427A
LOAD FRAME 1C427B
V89-0163
V89-0160
V89-0162
V89-0159
V89-0161
RETURN
V89-0191
V89-0176
V89-0178
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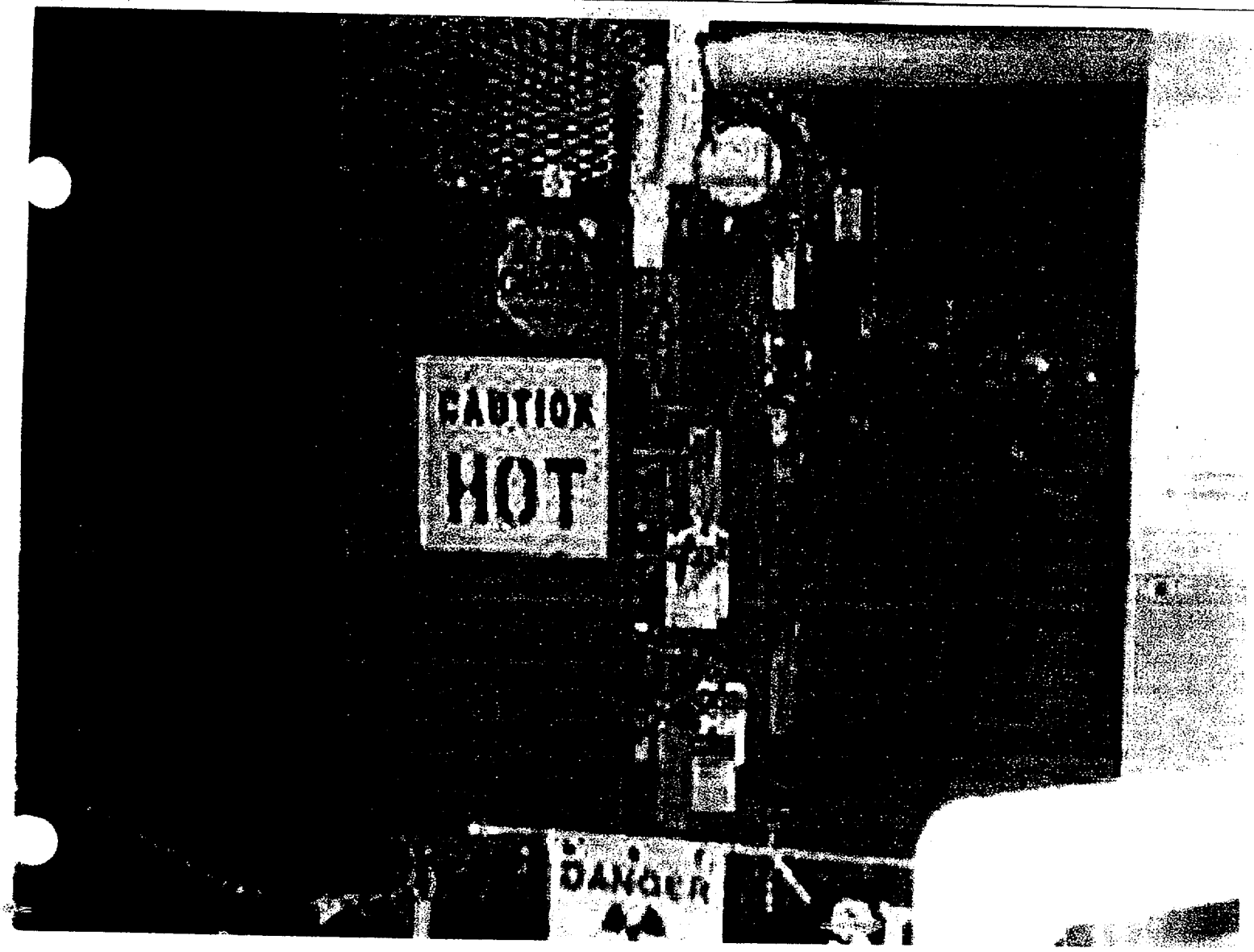
SUPPLY


CAUTION
HOT
DANGER

Duane Arnold
ıergy Center
HP Survey

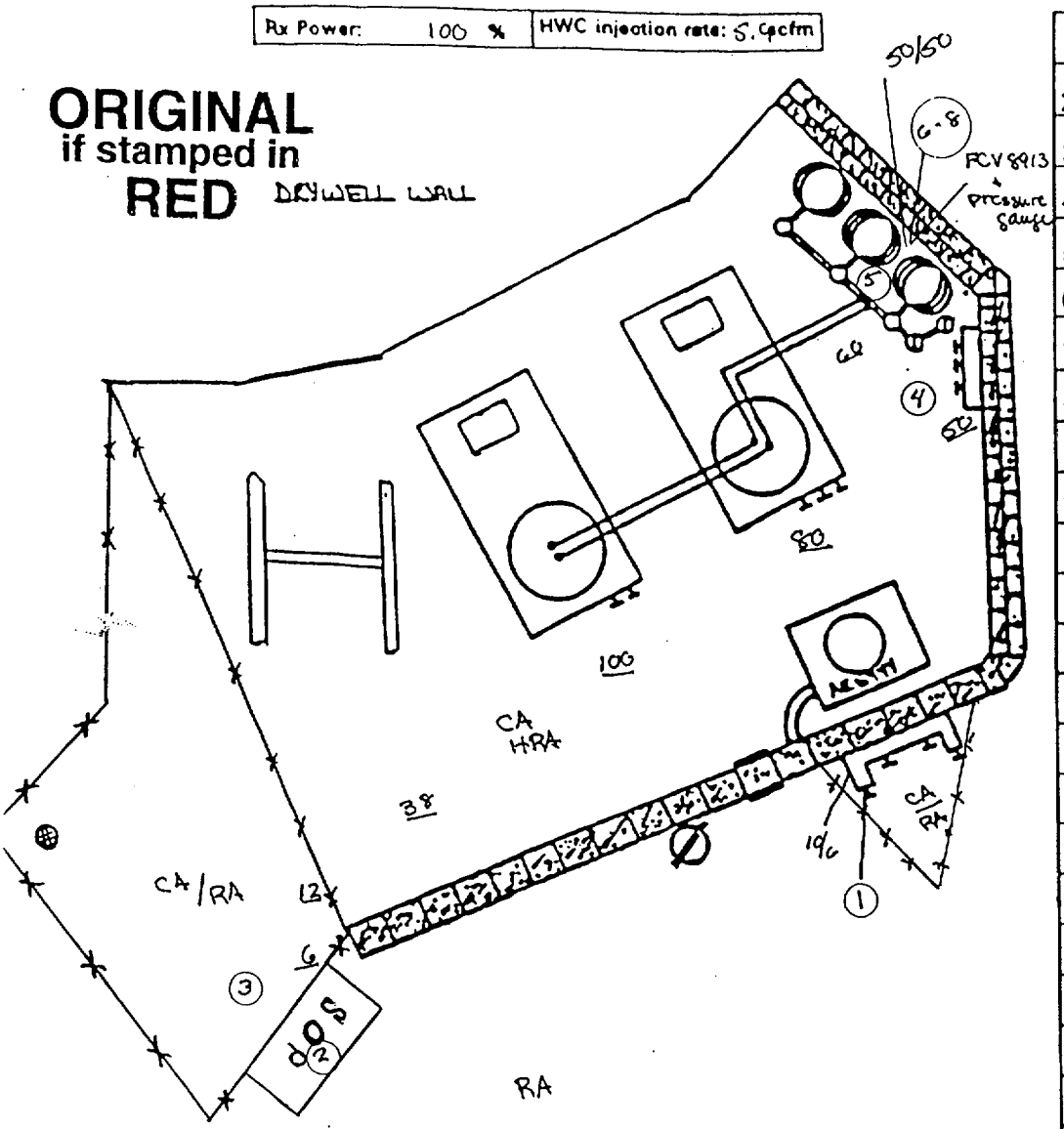
Survey # 00- 1806 / 1807

Key: Low Dose Area; (A) Alara Caution; (C) Caution Hot Spot; (D) Danger Hot Spot; (#) Smears; XXX Radiological Boundry; # / # Contact @ 30 cm; # Dose Rate mrem/Hr DDE; Dose Rate mrem/Hr DDE

| Map# | Location/Description | Date: 6 July 2000 | Freq. | Radiological Ranges | RWP - JS |
|---|---|---|---|---|---|
| RB223 | RB 786', C.A.V. AREA | | | Dose 6 - 100 | 52-2 |
| | JC- FCV 8913 plugged - troubleshoot | | 1xy | Cont. <1K - 28K | 23-6 |

| Rx Power: | 100 % | HWC injection rate: 5.6gpm |
|---|---|---|

**ORIGINAL**
**if stamped in**
**RED**




| # | Location | dpm 100cm^2 |
|---|---|---|
| 1 | valves | <1K |
| 2 | SOP | <1K |
| 3 | floor | 1K |
| 4 | floor | 4K |
| 5 | piping | 6K |
| 6 | pressure gauge | 12K |
| 7 | FCV 8913 o/s | 4K |
| 8 | FCV8913 fitting | 28K |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | | |
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# Duane Arnold Energy Center HP Survey

Survey # 00-1806/1807

| Surveyor | Date | Time | % Rx Pwr |
|---|---|---|---|
| Becky J Ross | 6 July 00 | 1015 | 100 |

| Air Sample # | Results |
|---|---|
| 00-693 | <2.35E-10 ~~<2.46E-12~~ uCi/cc |
| | uCi/cc |

| Instrument | Serial # | Cal. Due | Daily Ck |
|---|---|---|---|
| Hvd 177 | 28464 | 28 Feb 01 | ✓ |
| RO2 | 1443 | 30 Nov 00 | ✓ |
| Gil Air | 15302 | 31 Oct 00 | ✓ |
| | | | |
| | | | |
| | | | |

Comments:

One I&C tech dressed in lab coat and gloves manipulated valves on the $H_2O_2$ sensor panel. This tech was on RWP 52-2. Another ~~HP~~ I&C tech dressed in a single set opened 1/4-1/2" fittings in the CAV area to help determine where the line blockage exsisted. This tech was on 23-6. Intermitent HP coverage took place due to the opening of the system by the I&C tech. A rag was used by the I&C tech to collect any water (demin) that came out of the broken fitting. It was determined that the blockage was in FCV 8913. FCV 8913 was removed from the area and taken to the HL Decon Rm. FCV 8913 was 2K-28K dpm/100cm² and 12/1 mrem/hr. HL Tech notified of FCV 8913 work in the HL Decon Rm

ORIGINAL if stamped in RED

Becky J Ross

HP-41

# *DUANE ARNOLD ENERGY CENTER*

## JOB PERFORMANCE MEASURE

**NUMBER: 272000-02**

**TASK NUMBER: 1.07**

**TITLE: Perform Main Steam Line Radiation Monitor Channel Functional Test.**

**Rev. 0**

| | | |
|---|---|---|
| DEVELOPED BY: | Michael Fisher<br>Instructor | 2/5/2001<br>Date |
| VALIDATED BY: | [signature]<br>SME/Instructor | 2/11/2001<br>Date |
| REVIEWED BY: | [signature]<br>Plant Reviewer | 2-11-2001<br>Date |
| APPROVED BY: | [signature] for<br>Training Supervisor-Operations | 2/13/01<br>Date |

# DUANE ARNOLD ENERGY CENTER

## JOB PERFORMANCE MEASURE

| | | | |
|---|---|---|---|
| **JPM No.** 272000-02 | **JPM Description:** Perform Main Steam Line Radiation Monitor Channel Functional Test | | |
| **Task No.** 1.07 | **Task Description:** Perform Surveillance Testing | | |
| **K/A Reference: 272000** | A1.02 (2.9/2.9) 2.2.12 3.0/3.4 | | |
| APPLICABLE METHOD OF TESTING: RO/SRO | | | |
| Simulate Performance | | Actual Performance X | |
| Simulator X | In-Plant | Control Room | |
| Time for Completion: 15 minutes | | | |

# JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE

All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 7 through 10.

JPM No. 272000-02 JPM Title Perform Main Steam Line Radiation Monitor Channel Functional Test

✓ 1. Task description and number, JPM description and number are identified

✓ 2. Task elements identified and K/A references are included

✓ 3. Performance location specified

a. in-plant

b. control room

c. simulator

✓ 4. Initial conditions and cues identified

a. setup, required materials, and procedure

b. malfunctions and instructor actions

c. initiating and terminating cues

✓ 5. Task standards identified and verified by SME review

✓ 6. Critical tasks/steps identified meet criteria and identified with a "C"

✓ 7. Verify JPM steps fit the most current procedures
Procedure Rev. 2 Date 3-10-1999

✓ 8. Pilot test JPM

a. verify cues both verbal and visual are free of conflict

b. ensure performance time is accurate

9. If the JPM cannot be performed as written with proper responses, then revise the JPM

_____ 10. When JPM is revalidated, SME/Instructor signs and dates JPM

SME/Instructor Date

SME/Instructor Date

SME/Instructor Date

**SIMULATOR SETUP:**

**EVENT TRIGGERS**

None

**MALFUNCTIONS:**

None

**OVERRIDES:**

None

**REMOTE FUNCTIONS:**

None

**INSTRUCTOR ACTIONS:**

1. Read initial conditions and initiating cues to the operator.

**TASK STANDARDS:**

1. "A" Main Steam Line Rad Monitor Functional Test complete

**REQUIRED MATERIALS:**

STP 3.3.6.1-35

**GENERAL REFERENCES:**

STP 3.3.6.1-35

**Read to the operator the following information:**

**INITIAL CONDITIONS:**

1. Maintenance has been performed on RM-4448A.
2. STP 3.3.6.1-35, Main Steam Line Radiation Monitor Channel Functional Test is to be performed as post maintenance testing for RM-4448A.
3. I will be acting as a second operator assisting you and will only confirm or verify the actions that you direct me to confirm or verify.

**INITIATING CUES:**

As the OSS, I direct you to perform STP 3.3.6.1-35 for RM-4448A.

**This task is not time critical.**

**Inform the evaluator when you have completed the task.**

## PERFORMANCE INFORMATION

| NOTE: |
|---|
| Critical steps are denoted with a "C". Failure to meet the standard for this step constitutes failure. |

Time Start _____

NOTE: **All steps performed must be initialed for successful completion of the JPM.**

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: | Inform the OSS to record the AOT start time and record start time on STP. |
| STANDARD: | OSS informed to record AOT start time and STP start time recorded. |
| COMMENTS: This step would be N/A due to RM-4448A being Inoperable. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Record meter indication. |
| STANDARD: | Meter indication recorded. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C02, place MSL RR-4448 RED PEN CHANNEL SELECT RSS-4448A to MON A. |
| STANDARD: | MSL RR-4448 RED PEN CHANNEL SELECT RSS-4448A placed to MON A. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Record MAIN STEAM LINE RAD MONITOR RR-4448 red pen reading. |
| STANDARD: | MAIN STEAM LINE RAD MONITOR RR-4448 red pen reading recorded. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Place the mode switch to ZERO. |
| STANDARD: | Mode switch placed to ZERO. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C05, confirm the following annunciators activated:<br>1. MAIN STEAM LINE HI HI RAD/INOP TRIP (1C05B, C-2)<br>2. MAIN STEAM LINE RAD MONITOR DOWNSCALE (1C05B, E-2) |
| STANDARD: | Annunciators are confirmed to be activated. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Confirm computer point D524, MSL HI HI RAD/INOP TRIP CH A1 TRIP typed out. |
| STANDARD: | Computer point D524, MSL HI HI RAD/INOP TRIP CH A1 TRIP confirmed to be typed out. |
| COMMENTS: If alarm printer is not functioning correctly, inform the operator that alarm point D524 is printed out. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C15, visually confirm relay A71B-K44A PCIS TRIP CHANNEL A1 MAIN STEAM LINE HI RAD de-energized. |
| STANDARD: | A71B-K44A PCIS TRIP CHANNEL A1 MAIN STEAM LINE HI RAD relay visually confirmed to be de-energized. |
| COMMENTS: CUE: When the student identifies relay A71B-K44A, provide the cue that the relay is de-energized. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Confirm the following lights on:<br>1. INOP<br>2. DOWNSCALE |
| STANDARD: | INOP and DOWNSCALE lights are confirmed on. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Slide the drawer out for access to the internals. |
| STANDARD: | Drawer slid out. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Place the mode switch to TRIP TEST. |
| STANDARD: | Mode switch taken to TRIP TEST. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Adjust TRIP ADJUST (R50) for a reading of 10 on the meter. |
| STANDARD: | TRIP ADJUST (R50) adjusted for a reading of 10 on the meter. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C05, verify MAIN STEAM LINE RAD MONITOR DOWNSCALE annunciator (1C05B, E-2) reset. |
| STANDARD: | MAIN STEAM LINE RAD MONITOR DOWNSCALE annunciator (1C05B, E-2) verified to be reset. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Operate the TRIP RESET switch. |
| STANDARD: | TRIP RESET switch operated. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Confirm the following indicating lights off:<br>1. DOWNSCALE<br>2. UPSCALE HI<br>3. UPSCALE HI HI |
| STANDARD: | DOWNSCALE, UPSCALE HI, UPSCALE HI HI lights are confirmed off. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Depress and hold the INOP INH push-button. (until Step 7.1.22) |
| STANDARD: | INOP INH push-button depressed and held. |
| COMMENTS: This is Step 7.1.16. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C05, verify MAIN STEAM LINE HI HI RAD/INOP TRIP annunciator (1C05B, C-2) reset. |
| STANDARD: | MAIN STEAM LINE HI HI RAD/INOP TRIP annunciator (1C05B, C-2) verified reset. |
| COMMENTS: This will have to be done by the evaluator acting as a second operator. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Confirm computer point D524, MSL HI HI RAD/INOP TRIP CH A1 RSET typed out. |
| STANDARD: | Computer point D524, MSL HI HI RAD/INOP TRIP CH A1 RSET confirmed typed out. |
| COMMENTS: This will have to be done by the evaluator acting as a second operator. If alarm printer is not functioning correctly, inform the operator that alarm point D524 is printed out. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Slowly adjust TRIP ADJUST (R50) clockwise until the UPSCALE HI-HI indicating light is on. |
| STANDARD: | TRIP ADJUST (R50) slowly adjusted clockwise until the UPSCALE HI-HI indicating light is on. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C05, confirm the following annunciators activated:<br>1. MAIN STEAM LINE HI HI RAD/INOP TRIP (1C05B, C-2)<br>2. MAIN STEAM LINE HI RAD (1C05B, D-2) |
| STANDARD: | Annunciators are confirmed to be activated. |
| COMMENTS: This will have to be done by the evaluator acting as a second operator. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Confirm the UPSCALE HI indicating light on. |
| STANDARD: | UPSCALE HI indicating light confirmed on. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Release the INOP INH pushbutton. |
| STANDARD: | INOP INH pushbutton released. |
| COMMENTS: This is Step 7.1.22. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Adjust TRIP ADJUST (R50) counterclockwise for a reading of 10 on the meter. |
| STANDARD: | TRIP ADJUST (R50) adjusted counterclockwise for a reading of 10 on the meter. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Slide the drawer into the panel and secure. |
| STANDARD: | Drawer slid into the panel and secured. |
| COMMENTS: Note: The simulator panel is incapable of being "secured". If asked, provide the cue that the panel drawer is secure. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Place the mode switch in OPERATE. |
| STANDARD: | Mode switch placed in OPERATE. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Operate the TRIP RESET switch. |
| STANDARD: | TRIP RESET switch operated. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Verify all indicating lights off. |
| STANDARD: | All indicating lights verified off. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C05, verify the following annunciators reset:<br>1. MAIN STEAM LINE HI HI RAD/INOP TRIP (1C05B, C-2)<br>2. MAIN STEAM LINE HI RAD (1C05B, D-2) |
| STANDARD: | Annunciators verified reset. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C15, visually confirm relay A71B-K44A PCIS TRIP CHANNEL A1 MAIN STEAM LINE HI RAD energized. |
| STANDARD: | A71B-K44A PCIS TRIP CHANNEL A1 MAIN STEAM LINE HI RAD relay confirmed energized. |
| COMMENTS: Cue: When the student identifies relay A71B-K44A, provide the cue that the relay is energized. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Confirm RM-4448A meter indicates an acceptable value compared to Step 7.1.2 considering current plant conditions. |
| STANDARD: | RM-4448A meter confirmed to indicate an acceptable value. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C02, confirm MAIN STEAM LINE RAD MONITOR RR-4448 red pen indicates an acceptable value compared to Step 7.1.4 considering current plant conditions. |
| STANDARD: | MAIN STEAM LINE RAD MONITOR RR-4448 red pen confirmed to indicate an acceptable value. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Inform the OSS to record the AOT stop time and record stop time. |
| STANDARD: | OSS informed to record the AOT stop time and stop time recorded. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Complete the Acceptance Criteria Section of the STP. |
| STANDARD: | Acceptance Criteria Section completed with no problems noted. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Sign and date the STP as completed. |
| STANDARD: | STP signed and dated as completed. |
| COMMENTS: | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Forward the STP to the OSS. |
| STANDARD: | STP forwarded to OSS for operability determination for RM-4448A. |
| COMMENTS: | |

Time Stop _____

**TERMINATING CUES:** When the OSS has been given the completed STP.

## VERIFICATION OF COMPLETION

JPM No.: 272000-02 JPM Description: Perform Main Steam Line Radiation Monitor Channel Functional Test

Operator: _____ Evaluator: _____

Licensee: ☐ RO ☐ SRO ☐ SRO Cert
☐ STA ☐ NSPEO

Result: ☐ SATISFACTORY ☐ UNSATISFACTORY

**COMMENTS/FEEDBACK:** (Note any trainee discrepancies or misperformed steps.)

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_____ _____

Evaluator's Signature Date

# *DUANE ARNOLD ENERGY CENTER*

## JOB PERFORMANCE MEASURE

**NUMBER: 2.1.7-04**

**TASK NUMBER: 1.01**

**TITLE: Perform Control Room Shiftly Checklist - Faulted**

**Rev. 0**

| | | |
|---|---|---|
| DEVELOPED BY: | Instructor | 2-5-01<br>Date |
| VALIDATED BY: | SME/Instructor | 2/6/2001<br>Date |
| REVIEWED BY: | Plant Reviewer | 2-6-01<br>Date |
| APPROVED BY: | Training Supervisor-Operations | 2/13/01<br>Date |

# DUANE ARNOLD ENERGY CENTER

## JOB PERFORMANCE MEASURE

| | | |
|---|---|---|
| **JPM No.** 2.1.7-04 | **JPM Description:** While performing STP 3.0.0-02, the Operator will find equipment out of its required position. In addition to identifying the equipment, he will be required to determine what effect the out of position equipment has on the system operation. | |
| **Task No.** 1.01 | **Task Description:** Perform Control Panel Line-ups | |
| **K/A Reference:** Generic 2.1.7 | 3.7/3.6 | |
| APPLICABLE METHOD OF TESTING: RO/SRO | | |
| Simulate Performance | Actual Performance X | |
| Simulator X | In-Plant | Control Room |
| Time for Completion: 40 min. | | |

# JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE

All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 7 through 10.

JPM No. 2.1.7-04 JPM Title Perform control room shiftly checklist - faulted

_____ 1. Task description and number, JPM description and number are identified

_____ 2. Task elements identified and K/A references are included

_____ 3. Performance location specified

a. in-plant

b. control room

c. simulator

_____ 4. Initial conditions and cues identified

a. setup, required materials, and procedure

b. malfunctions and instructor actions

c. initiating and terminating cues

_____ 5. Task standards identified and verified by SME review

_____ 6. Critical tasks/steps identified meet criteria and identified with a "C"

_____ 7. Verify JPM steps fit the most current procedures
Procedure Rev. _____ Date _____

_____ 8. Pilot test JPM

a. verify cues both verbal and visual are free of conflict

b. ensure performance time is accurate

9. If the JPM cannot be performed as written with proper responses, then revise the JPM

_____ 10. When JPM is revalidated, SME/Instructor signs and dates JPM

_____ _____
SME/Instructor Date

_____ _____
SME/Instructor Date

_____ _____
SME/Instructor Date

**SIMULATOR SETUP:**

**EVENT TRIGGERS**

None

**MALFUNCTIONS:**

None

**OVERRIDES:**

| Time | Override No. | Override Title | ET | Delay | F. Sev. | Ramp | I. Sev. |
|---|---|---|---|---|---|---|---|
| T=0 | LO MS PCIS-BLPWR | CIMS B logic power available | N/A | N/A | OFF | N/A | N/A |

**REMOTE FUNCTIONS:**

None

**INSTRUCTOR ACTIONS:**

1. Set up the conditions as stated on the previous page.

2. Ensure that the HPCI and RCIC tape controllers are set, per STP 3.0.0-02.

3. Transfer HPCI pump suction from the CST to the Torus per OI-152.

4. Place HS-4640, Recirc OUTBD SAMPLE valve **CLOSED** position.

5. Place HS-6920B, "B" Chiller Chill Water Non-Essential Cooling Loop Control in the **OPEN** position.

6. Place HS-8100A and HS-8100B, Drywell Sample Isolation Valves in the **OVERRIDE** position.

7. Insert Override **LO MS PCIS-BLPWR**.

8. Read initial conditions and initiating cues to the operator.

**TASK STANDARDS:**

1. Determine that the HPCI pump suction is aligned to the Torus, and answer the short question pertaining to the consequences of this mis-positioned component.

2. Determine that CV-4640, Recirc Loop Outboard Sample Isolation Valve is closed, and answer the short question pertaining to the consequences of this mis-positioned component.

3. Determine that the Chill Water Non-Essential Cooling Loop Control "B" HS-6920B is positioned to OPEN with the "B" Chiller in service, and answer the short question pertaining to the consequences of this mis-positioned component.

4. Determine that HS-8100A and HS-8100B Drywell Sample Isolation Valve handswitches are positioned to the OVERRIDE position, and answer the short question pertaining to the consequences of these mispositioned components.

5. Determine that CIMS "B" Logic Power Available WHITE light is de-energized, and answer the short question pertaining to the consequences of this de-energized component.

6. This JPM has a total of 10 opportunities for the candidate to be evaluated on, he must achieve ≥80% of the opportunities to receive a passing score.

**REQUIRED MATERIALS:**

STP 3.0.0-02

**GENERAL REFERENCES:**

STP 3.0.0-02 Latest Revision

**Read to the operator the following information:**

**INITIAL CONDITIONS:**

1. The plant is operating at 100%; you are the on watch RO for Shift 1.
2. An EDG STP is scheduled to start in 45 minutes.
3. Another operator has completed some of STP 3.0.0-02, Control Room Panel Shiftly Checklist, and has been pulled off that job to respond to a quarterly fire drill.

**INITIATING CUES:**

The OSS directs that you perform the uncompleted portions of STP 3.0.0-02.

**This task is not time critical.**

**Inform the evaluator when you have completed the task.**

## PERFORMANCE INFORMATION

NOTE:

Critical steps are denoted with a "C". Failure to meet the standard for this step constitutes failure.

NOTE:
The incomplete portions of this STP may be completed in any order.

Time Start _____

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | On 1C03, determine that the HPCI pump suction is aligned to the Torus. |
| STANDARD: | Determines that the HPCI pump suction is aligned to the Torus. |

COMMENTS:
When the Operator notes that the HPCI pump suction is aligned to the Torus, ask him the following question.

Without using any references, what is the concern with the current lineup with respect to HPCI operability?

**Answer**: Words to the effect that with HPCI pump suction aligned to the Torus, the HPCI Keep Fill System must be in service to consider HPCI operable.

After the Answer is given, cue the Operator, that for the purposes of this JPM, now that you have identified this problem, we will continue with the STP.

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | On 1C04, determine that CV-4640, Recirc Loop Outboard Sample Isolation Valve is CLOSED. |
| STANDARD: | Determines that CV-4640 is CLOSED |

COMMENTS:
When the Operator notes that CV-4640 is closed, ask him the following question:

Without using any reference material, what is the effect of having this valve closed?

**Answer:** Words to the effect that, there is no sample flow to the CAVs system and the backup reactor water sampling capability would not be available.

After the Answer is given, cue the Operator, that for the purposes of this JPM, now that you have identified this problem, we will continue with the STP.

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C26, determine that HS-6920B, "B" Chiller Non-Essential Cooling Loop "B" is in the OPEN position with the "B Chiller in service. |
| STANDARD: | Determines that HS-6920B is in the OPEN position with "B" Chiller in service. |

COMMENTS:
When the Operator notes that HS-6920B is in the OPEN position with "B" Chiller in service, ask him the following question:

Without using any reference material, what are the consequences of this switch being in the wrong position?

**Answer:** Words to the effect that if a load shed of the Essential Buses were to occur, the chiller would shift from 200 to 75 horsepower, and with HS-6920B in the OPEN position the Chiller would be overloaded with the Non-Essential loop.

After the Answer is given, cue the Operator, that for the purposes of this JPM, now that you have identified this problem, we will continue with the STP.

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C29, determine that handswitches HS-8100A and B Drywell Sample Isolation Valves, are positioned to OVERRIDE. |
| STANDARD: | Determines that HS-8100A and B are in the OVERRIDE position. |

COMMENTS:
When the Operator notes that HS-8100A and B are in the OVERRIDE position, ask him the following question.

Without using any reference material, what is the effect of having these handswitches in the OVERRIDE position?

**Answer:** Words to the effect that these solenoid valves will not close if a Group 3 Isolation signal is received and/or these Primary Containment Isolation Valves are inoperable.

After the Answer is given, cue the Operator, that for the purposes of this JPM, now that you have identified this problem, we will continue with the STP.

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | At 1C04, determines that the CIMS "B" logic Power Available WHITE light is de-energized. |
| STANDARD: | Determines that the CIMS "B" logic Power Available WHITE light is de-energized. |

COMMENTS:
When the Operator notes that the CIMS "B" logic Power Available WHITE light is de-energized, ask him the following question:

Without using any reference material, is the CIMS "B" logic operational at this time? Why or why not?

> **Answer:** Yes, CIMS logic is power seeking, and will swap to the "A" power supply if "B" power supply is lost.

After the 5 question have been answered, inform the Operator that the JPM is finished.

Time Stop _____

**TERMINATING CUES:** 5 errors found and 5 questions answered.

## VERIFICATION OF COMPLETION

JPM No. 2.1.7-04 JPM Description Perform control room shiftly checklist - faulted

Operator: _____ Evaluator: _____

Licensee: ☐ RO ☐ SRO ☐ SRO Cert
☐ STA ☐ NSPEO

Result: ☐ SATISFACTORY ☐ UNSATISFACTORY

**COMMENTS/FEEDBACK:** (Note any trainee discrepancies or misperformed steps.)

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_____ _____
Evaluator's Signature Date

| DAEC<br>DUANE ARNOLD ENERGY CENTER | SURVEILLANCE TEST PROCEDURE<br>TITLE: CONTROL ROOM PANEL SHIFTLY CHECKLIST | STP 3.0.0-02<br>Page 1 of 38<br>Rev. 8 |
|---|---|---|

Effective Date: JUL 20 2000

Verified By: _____ Date: 6/28/2000
Testing and Surveillance

Validated By: _____ Date: 6-28-00
Operations

Verified By: _____ Date: 7-10-2000
System Engineering

Approved By: _____ Date: 7/12/00
Procedures

Reviewed By: _____ Date: 7/13/2000
Operations Committee

Approved By: _____ Date: 7/14/2000
Plant Manager, Nuclear

Reference Only

## 1.0 PURPOSE

1.1 The purpose of this STP is to verify Safety Related and other important components located on Control Room panels are in the desired position or condition. This is accomplished by verifying the proper indicating lights are energized, handswitches are in the proper position, controllers are adjusted properly and various annunciators are functioning properly. **{C001}**

1.2 This procedure, when performed in its entirety, FULLY SATISFIES the following DAEC Technical Specification surveillance requirements:

1.2.1 Verifies the continuity of the explosive charges associated with the Standby Liquid Control squib valves.

1.2.2 Post Accident Monitoring, Channel Check of PCIV indication.

1.2.3 Primary Containment Isolation Valves, verification of each 18-inch primary containment purge valve being closed.

1.2.4 Primary Containment Isolation Valves, verification of continuity of the traversing incore probe (TIP) shear isolation valve explosive charge.

1.2.5 Verifies each subsystem power operated and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position, for each of the following subsystems:

a. ECCS - Operating

b. ECCS - Shutdown

c. RCIC System

d. RHR Suppression Pool Cooling

e. CAD System

f. RHRSW System

g. RWS System

1.2.6 Verify each SDV vent and drain valve is open.

1.3 This procedure, when performed in its entirety, FULLY SATISFIES the DAEC Technical Requirements Manual surveillance requirement for verification of one Battery Exhaust Fan operating.

Reference Only

## 2.0 BRIEFING INFORMATION

2.1 PERFORMANCE INFORMATION

2.1.1 The checks performed during this STP may be performed in any convenient order. The data sheets allow for the logging of two shiftly checks each day on a single STP. A third column may be used as component status changes or as desired. The 0700-1900 crew completes Shift 1 checks and the 1900-0700 crew completes Shift 2 checks.

2.1.2 The steps given in Section 7.0 are instructions for completing the checklists contained in Attachment 1 and therefore do not require initialing. However, the person(s) performing the checks shall sign as Performer at the end of this STP.

2.1.3 Appendix A contains a list of abbreviations to be used to complete the checklist (Attachment 1). These abbreviations are to be recorded in the appropriate Shift column to record the as found status of the component.

2.1.4 Personnel recommended to perform this procedure:

3 Operations

2.1.5 Special Test Equipment required:

None

2.2 GENERAL CAUTIONS

2.2.1 For Override handswitches and keylock switches, the actual position of the switch must be confirmed. DO NOT assume that the switch is in the Normal position just because the amber indicating light is deenergized.

2.3 SPECIAL PRECAUTIONS

2.3.1 None

## 3.0 REFERENCES

3.1 Commitment Items:

3.1.1 **C001** - Commitment Control #930459 (NG-93-3592, Control Room Panel Shiftly Checklist Human Factors Improvements)

## 4.0 GENERAL INSTRUCTIONS

4.1 Data marked with a "TS" or "TM" in the Acceptance Criteria column are required by Technical Specifications or the Technical Requirements Manual. If the data does not meet its acceptance criteria, or cannot be recorded, an NRC reportable condition may exist. The data shall be reported to the Operations Shift Supervisor (OSS) immediately.

4.2 An Action Request (AR) shall be completed for any problems encountered with a "TS" or "TM" during this STP.

Reference Only

4.3 The OSS shall be notified immediately and the appropriate Limiting Condition for Operation section of Technical Specifications or the Technical Requirements Manual referred to whenever problems are encountered during the performance of this STP.

4.4 If any equipment or components are observed to be in a state of disrepair during the performance of this STP, appropriate corrective maintenance shall be initiated.

## 5.0 APPENDICES

5.1 Appendix A - List Of Abbreviations

Reference Only

| ABBREV. | INDICATION | COMPONENT STATUS |
|---|---|---|
| A or AUTO | Handswitch or keylock switch | AUTO or AUTOMATIC position |
| B | Both green and red indicating lights on | THROTTLED valves |
| BAL | | BAL or BALANCE position |
| CL | | CLOSED position |
| DE | Both green and red indicating lights off.<br>White light off | DEENERGIZED valves, Racked out brkrs.<br>Running RWS Pump Permissive |
| G | Green indicating light on, red indicating light off<br><br><br>Green flag showing | CLOSED valves<br>SECURED Pumps, Fans and other equip.<br>OPEN (deenergized) breakers<br>Breaker handswitch flag |
| N or NORM | | NORM or NORMAL position |
| MAN | | MAN or MANUAL position |
| OFF | | OFF position<br>Status Lights OFF |
| ON | Miscellaneous indicating lights on | Miscellaneous status |
| OP | | OPEN position |
| OVR | | OVERRIDE position |
| PTL | | PULL-TO-LOCK position |
| TC | HS-1937A Position | TORUS CLG, Torus Cooling Mode |
| TST or TEST | | TEST position |
| R | Red indicating light on, green indicating light off<br><br><br>Red flag showing | OPEN valves<br>OPERATING Pumps, fans and other equip.<br>SHUT (energized) breakers<br>Breaker handswitch flag |
| RST | | RESET position |
| S | Recirc Speed Control | S - Percent Speed Demand |
| SAT | Satisfactorily completed | Annunciator checks, lamp tests, computer display checks, Battery Fan checks |
| SB | | STANDBY position |
| SDC | HS-1937A Position | SHUTDN CLG, Shutdown Cooling Mode |
| START | | START position |
| STOP | | STOP position |
| UNSAT | Unsatisfactorily completed | |
| W | White indicating light on | BKR closing springs CHARGED<br>Squib Valve Continuity<br>Power Available<br>Pump Permissive |

NOTES:
1. For controller tape settings or other components requiring a numerical value in the Desired column, record the actual setting in the appropriate Shift column.
2. For any positions or conditions not covered by the above abbreviations, record the actual position/condition in the appropriate Shift column and use the margin at the bottom of the sheet if more space is needed.

Reference Only

## 6.0 PREREQUISITES

6.1 None

Reference Only

## 7.0 PROCEDURE

7.1 CONTROL ROOM PANEL SHIFTLY CHECKLIST

7.1.1 Compare the as found position/condition recorded in the Shift column against the desired position/condition listed in the Desired column.

a. For any as found positions/conditions that do not agree with the desired position/condition, record the reason in the Remarks column. Some examples of reasons may be tagout number, STP in progress, certain evolution in progress, etc.

b. For any as found positions/conditions that do not agree with the desired position/condition and do not have a known or valid reason for not agreeing, inform the OSS immediately and take actions to correct the condition.

7.1.2 For the Safety Parameter Display System, check that the displays can be called up on the terminal.

7.1.3 For the Containment Information Monitoring System (CIMS), perform the following:

a. Check each CIMS system white power available light is on.

b. Confirm no Isolation signals are present.

c. Perform a light check on the CIMS system and confirm each light energizes.

d. Confirm each CIMS Alarm Printer has paper, printed out the light test result and has not printed out any unexpected valve positions or conditions.

e. During the second half of the shift, confirm each CIMS Alarm Printer has not printed out any unexpected valve positions or conditions.

7.1.4 Perform an annunciator check on each of the Control Room Panels and confirm horns/sirens sound and annunciator windows illuminate/flash properly.

Reference Only

7.1.5 Perform checks on all Control Room, SANSOE Tour Area and NSAO Tour Area recorders. Checks shall include ensuring recorders are inking, paper advancing and, in general, functioning properly. Enter date and time on recorder charts.

| | | | |
|---|---|---|---|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| Performed by: | Date: | Time: | |

Reference Only

## 8.0 ACCEPTANCE CRITERIA

8.1 If this STP is performed for any reason other than for satisfying the PURPOSE as stated in Section 1.0, indicate below (otherwise mark this step "N/A"):

_____

_____

_____

_____

8.2 If a DCF, Procedure Work Request (PWR) or Action Request (AR) was written due to problems encountered with the performance of this procedure, list the applicable number(s) below and attach a copy of each to this procedure. ("N/A" blocks as appropriate.)

DCF No. _____ PWR No. _____ AR No. _____

DCF No. _____ PWR No. _____ AR No. _____

8.3 All Technical-Specification-required items, as indicated by "TS", have been performed satisfactorily:

8.3.1 Attachment 1 Shift 1 ( ) YES ( ) NO ➡ OSS notified _____

8.3.2 Attachment 1 Shift 2 ( ) YES ( ) NO ➡ OSS notified _____

8.4 All other items checked in this test have been performed satisfactorily:

8.4.1 Attachment 1 Shift 1 ( ) YES ( ) NO ➡ OSS notified _____

8.4.2 Attachment 1 Shift 2 ( ) YES ( ) NO ➡ OSS notified _____

8.5 Indicate any relevant test comments below, otherwise mark this step "N/A":

_____

_____

_____

_____

Reference Only

8.6 All checks reviewed for completeness by a second licensed operator:

8.6.1 Shift 1 Panel Checks _____

8.6.2 Shift 2 Panel Checks _____

8.7 All checks reviewed for completeness by an OSS:

8.7.1 Shift 1 Panel Checks _____

8.7.2 Shift 2 Panel Checks _____

_____ _____
Operations Date

_____ _____
Surveillance Coordinator Date

## 9.0 ATTACHMENTS

9.1 Attachment 1 - SHIFTLY PANEL CHECKS

Reference Only

## NITROGEN CONTROL
## 1C-35

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Suct Inboard Isol | CV-4378A | Ind Light | R | R | | | (TS) |
| Torus Discharge Isol | CV-4371C | Ind Light | R | R | | | (TS) |
| Suct Outboard Isol | CV-4378B | Ind Light | R | R | | | (TS) |
| Containment $N_2$ Supply | CV-4371A | Ind Light | R | R | | | (TS) |
| CV 4371A Group 3 Override | S583B | HS | N | N | | | |
| A CAD Inboard DW Upper | SV-4332A | Ind Light | G | G | | | (TS) |
| A CAD Inboard Torus North | SV-4334A | Ind Light | G | G | | | (TS) |
| A CAD Supply PCV Inlet | MO-4323A | Ind Light | G | G | | | (TS) |
| A CAD Supply PCV Outlet | MO-4320A | Ind Light | G | G | | | (TS) |
| A CAD Outboard DW Upper | SV-4332B | Ind Light | G | G | | | (TS) |
| A CAD Outboard Torus North | SV-4334B | Ind Light | G | G | | | (TS) |
| B CAD Inboard DW Lower | SV-4331A | Ind Light | G | G | | | (TS) |
| B CAD Inboard Torus West | SV-4333A | Ind Light | G | G | | | (TS) |
| B CAD Supply PCV Inlet | MO-4323B | Ind Light | G | G | | | (TS) |
| B CAD Supply PCV Outlet | MO-4320B | Ind Light | G | G | | | (TS) |
| B CAD Outboard DW Lower | SV-4331B | Ind Light | G | G | | | (TS) |
| B CAD Outboard Torus West | SV-4333B | Ind Light | G | G | | | (TS) |

Reference Only

**HPCI**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| HPCI Inbd Steam Line Isol | MO-2238 | Ind Light | R | | | | (TS) |
| HPCI Outbd Steam Line Isol | MO-2239 | Ind Light | R | | | | (TS) |
| Turbine Steam Supply | MO-2202 | Ind Light | G | | | | (TS) |
| Turbine Stop Vlv | HV-2201 | Ind Light | G | | | | (TS) |
| Turbine Cont Vlv | HV-2200 | Ind Light | G | | | | (TS) |
| HPCI Steam Line Drain Isol | CV-2211 | Ind Light | R | | | | |
| | | HS | A | | | | |
| HPCI Steam Line Drain Isol | CV-2212 | Ind Light | R | | | | |
| | | HS | A | | | | |
| Inbd Torus Suction Isol | MO-2321 | Ind Light | G | | | | (TS) |
| Outbd Torus Suction Isol | MO-2322 | Ind Light | G | | | | (TS) |
| CST Suction | MO-2300 | Ind Light | R | | | | (TS) |
| Condensate Pump | 1P-219 | Ind Light | G | | | | |
| Closed Radwaste Disch Isol | CV-2234 | Ind Light | R | | | | |
| | | HS | A | | | | |
| Closed Radwaste Disch Isol | CV-2235 | Ind Light | G | | | | |
| | | HS | A | | | | |
| Lube Oil & Condenser Clg Supply | MO-2247 | Ind Light | G | | | | |
| Exhaust Drain Pot Drain | SV-2219 | HS | A | | | | |
| Vacuum Pump | 1P-233 | Ind Light | G | | | | |
| | | HS | A | | | | |
| Min Flow Bypass | MO-2318 | Ind Light | G | | | | (TS) |
| Emergency Torus Fill Permissive | HS-2318A | HS | N | | | | |
| HPCI/RCIC Turb Exhaust Vacuum Bkr | MO-2290B | Ind Light | R | | | | (TS) |
| HPCI/RCIC Turb Exhaust Vacuum Bkr | MO-2290A | Ind Light | R | | | | (TS) |
| Aux Oil Pump | 1P-218 | Ind Light | G | | | | |
| | | HS | A | | | | |

Reference Only

**HPCI**
**1C-03**
**(Continued)**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Flow Control | FIC-2309 | Select Sw | A | | | | |
| | | Tape | ≥ 3100 | | | | |
| | | Output Meter | ≥ 100% | | | | |
| Pump Discharge | MO-2311 | Ind Light | R | | | | (TS) |
| HPCI Inject | MO-2312 | Ind Light | G | | | | (TS) |
| Test Bypass | CV-2315 | Ind Light | G | | | | (TS) |
| Redundant Shutoff | MO-2316 | Ind Light | G | | | | (TS) |
| Turbine Speed Test Select | HS-2257 | HS | N | | | | |
| AC Power to Turb Spd Test Ckt | HS-2258 | HS | Off | | | | |

**B CORE SPRAY**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Inbd Torus Suction | MO-2146 | Ind Light | R | R | | | (TS) |
| Outbd Torus Suct | MO-2120 | Ind Light | R | R | | | (TS) |
| B Core Spray Pump | 1P-211B | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| Min Flow Bypass | MO-2124 | Ind Light | R | R | | | (TS) |
| Test Bypass | MO-2132 | Ind Light | G | G | | | (TS) |
| Outbd Inject | MO-2135 | Ind Light | R | R | | | (TS) |
| Inbd Inject | MO-2137 | Ind Light | G | G | | | (TS) |
| Manual Isolation | V-21-43 (ZS-2143) | Ind Light | R | R | | | |

Reference Only

**PASS**
**1C-03**
**(Side A)**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Outbd RHR Sample Iso Override | HS-2052A | HS | N | N | | | |
| Inbd RHR Sample Isol Override | HS-2051A | HS | N | N | | | |
| Inbd Liq Sample Return To Torus | SV-8772A | Ind Light | G | G | | | (TS) |
| Inbd Loop A Jet Pump Sample Isol | SV-4594A | Ind Light | G | G | | | (TS) |
| Outbd Loop A Jet Pump Sample Isol | SV-4595A | Ind Light | G | G | | | (TS) |

**PASS**
**1C-03**
**(Side B)**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Outbd RHR Sample Iso Override | HS-1973A | HS | N | N | | | |
| Inbd RHR Sample Isol Override | HS-1972A | HS | N | N | | | |
| Outbd Liq Sample Return To Torus Isol | SV-8772B | Ind Light | G | G | | | (TS) |
| Inbd Loop B Jet Pump Sample Isol | SV-4594B | Ind Light | G | G | | | (TS) |
| Outbd Loop B Jet Pump Sample Isol | SV-4595B | Ind Light | G | G | | | (TS) |

Reference Only

**B RHR (cont'd)**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| RHR Manual Xtie Valve | V-19-48 | Ind Light | R | R | | | |
| Outbd Inject | MO-1904 | Ind Light | R | R | | | (TS) |
| Inbd Inject Isol | MO-1905 | Ind Light | G | G | | | (TS) |
| Manual Isolation | V-19-147 (ZS-1907) | Ind Light | R | R | | | |
| Manual Isolation Shutdown Clg Isol | V-19-148 (ZS-1993) | Ind Light | R | R | | | |
| Inbd Shutdown Clg Isol | MO-1908 | Ind Light | G | G | | | (TS) |
| Outbd Shutdown Clg Isol | MO-1909 | Ind Light | G | G | | | (TS) |

**A RHR**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Torus Suction | MO-2069 | Ind Light | R | R | | | (TS) |
| A Pump Torus Suction | MO-2012 | Ind Light | R | R | | | (TS) |
| A Pump Shutdown Clg Suction | MO-2011 | Ind Light | G | G | | | (TS) |
| C Pump Shutdown Clg Suction | MO-2016 | Ind Light | G | G | | | (TS) |
| C Pump Torus Suction | MO-2015 | Ind Light | R | R | | | (TS) |
| C RHR Pump | 1P-229C | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| Min Flow Bypass | MO-2009 | Ind Light | G | G | | | (TS) |
| A RHR Pump | 1P-229A | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| A HX Inlet | MO-2029 | Ind Light | R | R | | | (TS) |
| A Heat Exch Outlet | MO-2031 | Ind Light | R | R | | | (TS) |
| A Heat Exch Bypass | MO-2030 | Ind Light | R | R | | | (TS) |
| Inbd RHR Sample Isol | SV-2051 | Ind Light | G | G | | | |
| Outbd RHR Sample Isol | SV-2052 | Ind Light | G | G | | | |
| A RHR HX Shell Outbd Vent | MO-2044A | Ind Light | G | G | | | (TS) |
| A RHR HX Shell Inbd Vent | MO-2044B | Ind Light | G | G | | | (TS) |
| Outbd Torus Clg/Spray | MO-2005 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |

Reference Only

**B RHR**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Torus Suction | MO-1989 | Ind Light | R | R | | | (TS) |
| B Pump Torus Suction | MO-1913 | Ind Light | R | R | | | (TS) |
| B Pump Shutdown Clg Suction | MO-1912 | Ind Light | G | G | | | (TS) |
| D Pump Shutdown Clg Suction | MO-1920 | Ind Light | G | G | | | (TS) |
| D Pump Torus Suction | MO-1921 | Ind Light | R | R | | | (TS) |
| D RHR Pump | 1P-229D | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| Min Flow Bypass | MO-1935 | Ind Light | G | G | | | (TS) |
| B RHR Pump | 1P-229B | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| B HX Inlet | MO-1939 | Ind Light | R | R | | | (TS) |
| B Heat Exch Outlet | MO-1941 | Ind Light | R | R | | | (TS) |
| B Heat Exch Bypass | MO-1940 | Ind Light | R | R | | | (TS) |
| Inbd RHR Sample Isol | SV-1972 | Ind Light | G | G | | | |
| Outbd RHR Sample Isol | SV-1973 | Ind Light | G | G | | | |
| B RHR Hx Shell Outbd Vent | MO-1949A | Ind Light | G | G | | | (TS) |
| B RHR Hx Shell Inbd Vent | MO-1949B | Ind Light | G | G | | | (TS) |
| Outbd Torus Clg/Spray | MO-1932 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Torus Cooling/Test | MO-1934 | Ind Light | G | G | | | (TS) |
| Torus Spray | MO-1933 | Ind Light | G | G | | | (TS) |
| Outbd Drywell Spray | MO-1903 | Ind Light | G | G | | | (TS) |
| Inbd Drywell Spray | MO-1902 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Inbd RHR Drain To RW Isol | MO-1937 | Ind Light | G | G | | | (TS) |
| Shutdown Cooling 135# Interlock Enable | HS-1937A | HS | TC Note 1 | TC | | | |
| Outbd RHR Drain To RW Thrtl Isol | MO-1936 | Ind Light | G | G | | | (TS) |

Note 1: If RHR is in shutdown cooling mode, HS-1937A shall be in SHUTDN CLG (SDC) position. In all other RHR modes, HS-1937A shall be in TORUS CLG (TC) position.

Reference Only

**A RHR (cont'd)**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Torus Cooling/Test | MO-2007 | Ind Light | G | G | | | (TS) |
| Torus Spray | MO-2006 | Ind Light | G | G | | | (TS) |
| Outbd Drywell Spray | MO-2001 | Ind Light | G | G | | | (TS) |
| Inbd Drywell Spray | MO-2000 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| RHR Crosstie | MO-2010 | Ind Light | R | R | | | (TS) |
| Outbd Inject | MO-2004 | Ind Light | R | R | | | (TS) |
| Inbd Inject Isol | MO-2003 | Ind Light | G | G | | | (TS) |
| Manual Isolation | V-20-81 (ZS-2008) | Ind Light | R | R | | | |

**A RHRSW**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| A RHRSW Pump | 1P-22A | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| C RHRSW Pump | 1P-22C | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| RHRSW to RHR ΔP MO-2046 Control | PDIC-2046 | Select Sw | A | A | | | (TS) |
| | | Tape | ≥ 20 | 20 | | | (TS) |
| MO-2046 Pump Run Intlk Override | HS-2046 | HS | N | N | | | |
| A & C RHRSW Pumps LOCA Trip Override | HS-2059 | HS | A | A | | | |

**RHRSW (Common)**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| RHRSW to RHR Crosstie | MO-1942 | Ind Light | G | G | | | (TS) |
| RHRSW Pumps A & C Crosstie | MO-1943A | Ind Light | G | G | | | (TS) |
| RHRSW Pumps B & D Crosstie | MO-1943B | Ind Light | G | G | | | (TS) |

Reference Only

**B RHRSW**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| B RHRSW Pump | 1P-22B | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| D RHRSW Pump | 1P-22D | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| RHRSW to RHR ΔP MO-1947 Control | PDIC-1947 | Select Sw | A | A | | | (TS) |
| | | Tape | ≥ 20 | 20 | | | (TS) |
| MO-1947 Pump Run Intlk Override | HS-1947B | HS | N | N | | | |
| B & D RHRSW Pumps LOCA Trip Override | HS-1959 | HS | A | A | | | |

**A CORE SPRAY**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Inbd Torus Suction | MO-2147 | Ind Light | R | R | | | (TS) |
| Outbd Torus Suction | MO-2100 | Ind Light | R | R | | | (TS) |
| A Core Spray Pump | 1P-211A | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| Min Flow Bypass | MO-2104 | Ind Light | R | R | | | (TS) |
| Test Bypass | MO-2112 | Ind Light | G | G | | | (TS) |
| Outbd Inject | MO-2115 | Ind Light | R | R | | | (TS) |
| Inbd Inject | MO-2117 | Ind Light | G | G | | | (TS) |
| Manual Isolation | V-21-42 (ZS-2142) | Ind Light | R | R | | | |

Reference Only

**ADS**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| A Logic ADS Timer Reset | HS-4461 | HS | RST | RST | | | |
| B Logic ADS Timer Reset | HS-4462 | HS | RST | RST | | | |
| ADS PSV-4400 | PSV-4400 | Ind Light | G | G | | | |
| ADS PSV-4402 | PSV-4402 | Ind Light | G | G | | | |
| ADS PSV-4405 | PSV-4405 | Ind Light | G | G | | | |
| ADS PSV-4406 | PSV-4406 | Ind Light | G | G | | | |
| LLS PSV-4401 | PSV-4401 | Ind Light | G | G | | | |
| LLS PSV-4407 | PSV-4407 | Ind Light | G | G | | | |

**PCIS**
**1C-03**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Containment Vent Path Select (1C-05) | A71B-S34 | HS | N | N | | | |
| Inbd Torus Vent Isol | CV-4300 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Outbd Torus Vent Isol | CV-4301 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Inbd Torus Vent Bypass Isol | CV-4309 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Inbd Drywell Vent Isol | CV-4302 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Outbd Drywell Vent Isol | CV-4303 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Inbd DW Vent Bypass Isol | CV-4310 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Outbd Cont Purge Supply Isol | CV-4306 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Inbd DW Purge Inlet Isol | CV-4307 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Inbd Torus Purge Inlet Isol | CV-4308 | Ind Light | G | G | | | (TS) |
| | | HS | CL | CL | | | |
| Cont $N_2$ Make-up Supply Isol | CV-4311 | Ind Light | R | R | | | (TS) |
| | | HS | A-OP | A-OP | | | |
| DW Make-up Inlet Isol | CV-4312 | Ind Light | G or R | G | | | (TS) |
| | | HS | A-OP | A-OP | | | |
| Torus $N_2$ Make-up Inlet Isol | CV-4313 | Ind Light | G or R | G | | | (TS) |
| | | HS | A-OP | A-OP | | | |

Reference Only

## PCIS (cont'd)
## 1C-03

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Inbd Torus Vent | MO-4309A | Ind Light | R | R | | | |
| Inbd Drywell Vent | MO-4310A | Ind Light | R | R | | | |
| Hard Pipe Vent | CV-4357 | Ind Light | G | G | | | |
| SBGT Inlet Relief Discharge (PCIS Mimic) | 1V-AD-0110 | Ind Light | G | G | | | |

## RB TO TORUS VACUUM BKRS
## 1C-03

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| External Vacuum Bkr Isol | CV-4304 | Ind Light (above HS) | G | G | | | (TS) |
| Vacuum Bkr (PCIS Mimic) | ZS-4329 | Ind Light | G | G | | | |
| External Vacuum Bkr Isol | CV-4305 | Ind Light (above HS) | G | G | | | (TS) |
| Vacuum Bkr (PCIS Mimic) | ZS-4330 | Ind Light | G | G | | | |

## INBOARD MSIVs & MSL DRN
## 1C-03

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Inbd Main Steam Line Drain | MO-4423 | Ind Light | G | G | | | (TS) |
| A Inbd MSIV Control | CV-4412 | Ind Light | R | R | | | (TS) |
| B Inbd MSIV Control | CV-4415 | Ind Light | R | R | | | (TS) |
| C Inbd MSIV Control | CV-4418 | Ind Light | R | R | | | (TS) |
| D Inbd MSIV Control | CV-4420 | Ind Light | R | R | | | (TS) |

## OUTBOARD MSIVs & MSL DRN
## 1C-04

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Outbd Main Steam Line Drain | MO-4424 | Ind Light | G | G | | | (TS) |
| A Outbd MSIV Control | CV-4413 | Ind Light | R | R | | | (TS) |
| B Outbd MSIV Control | CV-4416 | Ind Light | R | R | | | (TS) |
| C Outbd MSIV Control | CV-4419 | Ind Light | R | R | | | (TS) |
| D Outbd MSIV Control | CV-4421 | Ind Light | R | R | | | (TS) |

Reference Only

**RCIC**
**1C-04**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| RCIC Inbd Steam Line Isol | MO-2400 | Ind Light | R | R | | | (TS) |
| RCIC Outbd Steam Line Isol | MO-2401 | Ind Light | R | R | | | (TS) |
| Turbine Steam Supply | MO-2404 | Ind Light | G | G | | | (TS) |
| Turbine Stop Valve | MO-2405 | Ind Light | R | R | | | (TS) |
| Turbine Stop Valve Motor Control | MO-2405 | Ind Light | R | R | | | (TS) |
| Turbine Control Valve | HV-2406 | Ind Light | R | R | | | (TS) |
| RCIC Steam Line Drain Isol | CV-2410 | Ind Light | R | R | | | |
| | | HS | A | A | | | |
| RCIC Steam Line Drain Isol | CV-2411 | Ind Light | R | R | | | |
| | | HS | A | A | | | |
| Inbd Torus Suction | MO-2516 | Ind Light | G | G | | | (TS) |
| Outbd Torus Suction | MO-2517 | Ind Light | G | G | | | (TS) |
| CST Suction | MO-2500 | Ind Light | R | R | | | (TS) |
| Condensate Pump | 1P-228 | Ind light | G | G | | | |
| Closed Radwaste Disch Isol | CV-2435 | Ind Light | G | G | | | |
| | | HS | A | A | | | |
| Closed Radwaste Disch Isol | CV-2436 | Ind Light | R | R | | | |
| | | HS | A | A | | | |
| Lube Oil Cooler Supply | MO-2426 | Ind Light | G | G | | | |
| Vacuum Pump | 1P-227 | Ind Light | G | G | | | |
| | | HS | A | A | | | |
| Min Flow Bypass | MO-2510 | Ind Light | G | G | | | (TS) |
| Turbine Speed Test Select | HS-2462C | HS | N | N | | | |
| AC Power to Turbine Speed Test Ckt | HS-2462B | HS | Off | OFF | | | |
| Flow Control | FIC-2509 | Select Sw | A | A | | | |
| | | Tape | ≥ 415 | 415 | | | |
| | | Output Meter | ≥ 100% | ≥100 | | | |
| Pump Discharge | MO-2511 | Ind Light | R | R | | | (TS) |
| RCIC Inject | MO-2512 | Ind Light | G | G | | | (TS) |
| Test Bypass | MO-2515 | Ind Light | G | G | | | (TS) |

Reference Only

## DRYWELL SUMPS
## 1C-04

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Inbd DW Equip Drain Isol | CV-3728 | Ind Light | R | R | | | (TS) |
| | | HS | OP | OP | | | |
| Outbd DW Equip Drain Isol | CV-3729 | Ind Light | R | R | | | (TS) |
| | | HS | OP | OP | | | |
| Inbd DW Floor Drain Isol | CV-3704 | Ind Light | R | R | | | (TS) |
| | | HS | OP | OP | | | |
| Outbd DW Floor Drain Isol | CV-3705 | Ind Light | R | R | | | (TS) |
| | | HS | OP | OP | | | |

## RWCU
## 1C-04

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Inbd Cleanup Suct Isol | MO-2700 | Ind Light | R | R | | | (TS) |
| Outbd Cleanup Suct Isol | MO-2701 | Ind Light | R | R | | | (TS) |
| Cleanup Outbd Return Isol | MO-2740 | Ind Light | R | R | | | (TS) |
| Cleanup Drain to Main Condenser | MO-2731 | Ind Light | G | G | | | |
| Cleanup Drain to Radwaste | MO-2732 | Ind Light | G | G | | | |

## RX HEAD VENT AND RECIRC
## 1C-04

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Outbd RX Head Vent | CV-4429 | Ind Light | G | | | | |
| Inbd RX Head Vent | CV-4428 | Ind Light | G | | | | |
| A Pump Mini Purge Isol | CV-1804A | Ind Light | R | | | | (TS) |
| B Pump Mini Purge Isol | CV-1804B | Ind Light | R | | | | (TS) |
| Outbd Loop Sample Isol | CV-4640 | Ind Light | R | | | | (TS) |
| | | HS | A-OP | | | | |
| Inbd Loop Sample Isol | CV-4639 | Ind Light | R | | | | (TS) |
| | | HS | A-OP | | | | |
| CV-4640 Gp 1 Isol Override | HS-4640A | HS | N | | | | |
| CV-4639 Gp 1 Isol Override | HS-4639A | HS | N | | | | |
| A MG SET SPEED CONTROL | SIC-9245A | AUTO/MAN Ind Light | G | | | | |
| | | Display Ind Light | S | | | | |
| B MG SET SPEED CONTROL | SIC-9245B | AUTO/MAN Ind Light | G | | | | |
| | | Display Ind Light | S | | | | |

Reference Only

## SCRAM DISCHARGE VOLUME
## 1C-05

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| SDV Vent | CV-1859B | Ind Light | R | | | | (TS) |
| SDV Vent | CV-1859A | Ind Light | R | | | | (TS) |
| SDV Drain | CV-1867B | Ind Light | R | | | | (TS) |
| SDV Drain | CV-1867A | Ind Light | R | | | | (TS) |
| Vent & Drain Valve Control | HS-1870 | HS | N | | | | |
| High Water Level Bypass | C71A-S4 | HS | N | | | | |

## SBLC
## 1C-05

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Manual Isolation | V-26-32 (ZS-2615) | Ind Light | R | | | | |
| Squib Valve Ready | XS2618A | Continuity Light | W | | | | (TS) |
| Squib Valve Ready | XS2618B | Continuity Light | W | | | | (TS) |
| A SBLC Pump | 1P-230A | Ind Light | G | | | | |
| B SBLC Pump | 1P-230B | Ind Light | G | | | | |
| Pump & Squib Valve Control | HS-2613 | HS | Stop | | | | |

## RBCCW
## 1C-06

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| RBCCW Drywell Inlet | MO-4841B | Ind Light | R | R | | | (TS) |
| RBCCW Drywell Outlet | MO-4841A | Ind Light | R | R | | | (TS) |

## WELL WATER TO CHILLER
## 1C-06

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Well Water From B Chiller | MO-2078 | Ind Light | R | R | | | |
| Well Water To B Chiller | MO-2039B | Ind Light | R | R | | | |
| B ESW/RHRSW Discharge To Clg Towers | MO-1998B | Ind Light | R | R | | | (TS) |
| Well Water From A Chiller | MO-2077 | Ind Light | R | R | | | |
| Well Water To A Chiller | MO-2039A | Ind Light | R | R | | | |
| A ESW/RHRSW Discharge To Clg Towers | MO-1998A | Ind Light | R | R | | | (TS) |

Reference Only

**RWS**
**1C-06**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| A RWS Pump Note 2 | 1P-117A | Ind Light | R or G | | | | |
| | | HS | A | | | | |
| C RWS Pump Note 2 | 1P-117C | Ind Light | R or G | | | | |
| | | HS | A | | | | |
| Load Shed Auto Start RWS Pump Select | HSS-2911A Note 3 | HS | Pump A or C | | | | |
| Start Permissive | 1P-117A | Start Permissive Light | W or DE | | | | |
| Start Permissive | 1P-117C | Start Permissive Light | W or DE | | | | |
| B RWS Pump Note 2 | 1P-117B | Ind Light | R or G | | | | |
| | | HS | A | | | | |
| D RWS Pump Note 2 | 1P-117D | Ind Light | R or G | | | | |
| | | HS | A | | | | |
| Load Shed Auto Start RWS Pump Select | HSS-2911B Note 3 | HS | Pump B or D | | | | |
| Start Permissive | 1P-117B | Start Permissive Light | W or DE | | | | |
| Start Permissive | 1P-117D | Start Permissive Light | W or DE | | | | |
| A RWS to RW Dilution | CV-4910A | Ind Light | R | | | | (TS) |
| B RWS to RW Dilution | CV-4910B | Ind Light | R | | | | (TS) |
| A RWS Make-up | CV-4915 | Ind Light | G, R or B | | | | (TS) |
| | | HS | A | | | | (TS) |
| B RWS Make-up | CV-4914 | Ind Light | G, R or B | | | | (TS) |
| | | HS | A | | | | (TS) |
| Radwaste Dilution Flow | CV-4909 | Ind Light | G or R | | | | (TS) |

Note 2: At least one RWS pump should be running when plant is operating. All RWS pumps may be secured as required when plant is shut down.

Note 3: Should be selected to an operable non-running pump, if available.

Reference Only

## ESW
## 1C-06

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| A ESW Pump | 1P-99A | Ind Light | G | G | | | |
| B ESW Pump | 1P-99B | Ind Light | G | G | | | |

## ELECTRICAL DISTRIBUTION
## 1C-08

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| A Diesel Generator 1G-31 Stop Relay Reset | 1G-31 | Ind Light | W | W | | | |
| A Diesel Generator 1G-31 Control | HS-3231A | HS | A | A | | | |
| A Diesel Oil Transfer Pump 1P-44A | HS-3201 | HS | A | A | | | |
| B Diesel Generator 1G-21 Stop Relay Reset | 1G-21 | Ind Light | W | W | | | |
| B Diesel Generator 1G-21 Control | HS-3231B | HS | A | A | | | |
| B Diesel Oil Transfer Pump 1P-44B | HS-3202 | HS | A | A | | | |
| A Diesel Generator 1G-31 Bkr | 1A311 | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |
| B Diesel Generator 1G-21 Bkr | 1A411 | Ind Light | G | G | | | |
| | | Bkr Charged Light | W | W | | | |
| | | Flag | G | G | | | |

## 4160 BUS TRANSFER
## 1C-08

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Bus 1A1 Transfer | | HS | A | A | | | |
| Bus 1A3 Transfer | | HS | A | A | | | |
| Bus 1A4 Transfer | | HS | A | A | | | |
| Bus 1A2 Transfer | | HS | A | A | | | |

Reference Only

## CONTROL BLDG HVAC
## 1C-26

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Battery Exhaust Fan Note 4 | 1V-EF-30A | Ind Light | R | | | | |
| | | HS | On-A | | | | |
| Battery Exhaust Fan Note 4 | 1V-EF-30C | Ind Light | G or R | | | | |
| | | HS | Off-A or On-A | | | | |
| Battery Exhaust Fan Note 4 | 1V-EF-30B | Ind Light | G or R | | | | |
| | | HS | Off-A or On-A | | | | |
| Battery Exhaust Fans Note 4 | 1V-EF-30A, B, or C | At least one fan operating | SAT | | | | (TM) |
| Intake Isolation Damper | 1V-AD-30A | Ind Light | R | | | | |
| Intake Isolation Damper | 1V-AD-30B | Ind Light | R | | | | |
| A Control Room Supply Fan | 1V-AC-30A | Ind Light | G or R | | | | |
| B Control Room Supply Fan | 1V-AC-30B | Ind Light | G or R | | | | |
| A Control Room Return Fan | 1V-RF-30A | Ind Light | G or R | | | | |
| B Control Room Return Fan | 1V-RF-30B | Ind Light | G or R | | | | |
| Recirc & Exhaust Isol Damper | 1V-AD-31A | Ind Light | G, R or B | | | | |
| Exhaust Isolation Damper | 1V-AD-31B | Ind Light | R | | | | |

Note 4: Per OI 730, after an isolation only 1V-EF-30B or C shall be running. If flow from the battery rooms is not limited to 100 CFM following an isolation the control room SFU may not be able to maintain the control room at a positive pressure. Therefore, to maintain positive pressure during a Control Building Isolation, only one Battery Exhaust Fan 1V-EF-30B or 1V-EF-30C shall be running.

## A SFU
## 1C-26

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| A SFU Mode Select | HS-7316A | HS | A | | | | |
| A SFU Lockout Relay | L/R-7315A | HS | RST | | | | |
| A SFU Flow Control AV-7318A | FIC-7320A | Select Sw | A | | | | |
| | | Tape | ≥ 1000 | | | | |
| | | Output Meter | ≥ 98% | | | | |
| A SFU Fan | 1V-SF-30A | Ind Light | G | | | | |
| Discharge Valve | AV-7318A | Ind Light | G | | | | |
| Filter Exhaust Fan | 1V-EF-36A | Ind Light | G | | | | |
| Electric Heater | EC-7304A | Ind Light | G | | | | |
| Intake Vlv | AV-7301A | Ind Light | G | | | | |
| A SFU Total Run Time | SFU Run Time Log | Total Run Time | <720 hours | | | | Only required if A SFU is in operation, otherwise N/A |

Reference Only

**B SFU**
**1C-26**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| B SFU Mode Sel | HS-7316B | HS | A | | | | |
| B SFU Lockout Relay | L/R 7315B | HS | RST | | | | |
| B SFU Flow Control AV-7318B | FIC-7320B | Select Sw | A | | | | |
| | | Tape | ≥ 1000 | | | | |
| | | Output Meter | ≥ 98% | | | | |
| B SFU Fan | 1V-SF-30B | Ind Light | G | | | | |
| Discharge Valve | AV-7318B | Ind Light | G | | | | |
| Filter Exhaust Fan | 1V-EF-36B | Ind Light | G | | | | |
| Electric Heater | EC-7304B | Ind Light | G | | | | |
| Intake Vlv | AV-7301B | Ind Light | G | | | | |
| B SFU Total Run Time | SFU Run Time Log | Total Run Time | <720 hours | | | | Only required if B SFU is in operation, otherwise N/A |

**CONTROL BLDG COOLING**
**1C-26**

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Non-Essential Cooling Loop Control 'A' | HS-6920A | HS | CL or A | | | | |
| A Control Bldg Chiller Note 5 | 1V-CH-1A | Ind Light | G or R | | | | |
| | | HS | PTL or A | | | | |
| Chilled Water Pump | 1V-CP-30A | Ind Light | G or R | | | | |
| B Control Bldg Chiller Note 5 | 1V-CH-1B | Ind Light | G or R | | | | |
| | | HS | PTL or A | | | | |
| Chilled Water Pump | 1V-CP-30B | Ind Light | G or R | | | | |
| Non-Essential Cooling Loop Control 'B' | HS-6920B | HS | CL or A | | | | |

Note 5: One Control Bldg Chiller and its associated Chilled Water Pump should always be running. AUTO HS position is not labeled.

Reference Only

## SECONDARY CONTAINMENT ISOLATION DAMPERS
## 1C-23

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| RW Bldg To Torus Area Isol Damper | 1V-AD-42A | Ind Light | R | R | | | |
| RW Bldg To Torus Area Isol Damper | 1V-AD-42B | Ind Light | R | R | | | |
| RW Bldg To Mach Shop Isol Damper | 1V-AD-52A | Ind Light | R | R | | | |
| RW Bldg To Mach Shop Isol Damper | 1V-AD-52B | Ind Light | R | R | | | |
| Mach Shop To Torus Area Isol Damper | 1V-AD-51A | Ind Light | R | R | | | |
| Mach Shop To Torus Area Isol Damper | 1V-AD-51B | Ind Light | R | R | | | |
| Supply Air To Rx Bldg Isol Damper | 1V-AD-17A3 | Ind Light | R | R | | | |
| Supply Air To Rx Bldg Isol Damper | 1V-AD-17B3 | Ind Light | R | R | | | |
| Supply Air To Rx Bldg Isol Damper | 1V-AD-17A2 | Ind Light | R | R | | | |
| Supply Air To Rx Bldg Isol Damper | 1V-AD-17B2 | Ind Light | R | R | | | |
| Supply Air To Rx Bldg Isol Damper | 1V-AD-17A1 | Ind Light | R | R | | | |
| Supply Air To Rx Bldg Isol Damper | 1V-AD-17B1 | Ind Light | R | R | | | |
| 1V-EF-13A/B Disch To OG Stack Isol Damper | 1V-AD-15A | Ind Light | R | R | | | |
| 1V-EF-13A/B Disch To OG Stack Isol Damper | 1V-AD-15B | Ind Light | R | R | | | |
| Retention Bldg To Rx Bldg Isol Damper | 1V-AD-19A | Ind Light | R | R | | | |
| Retention Bldg To Rx Bldg Isol Damper | 1V-AD-19B | Ind Light | R | R | | | |
| Outside Air To RW Bldg Isol Damper | 1V-AD-44A | Ind Light | R | R | | | |
| Outside Air To RW Bldg Isol Damper | 1V-AD-44B | Ind Light | R | R | | | |
| Rx Bldg Exh Fan Inlet Isol Damper | 1V-AD-13A | Ind Light | R | R | | | |
| Rx Bldg Exh Fan Inlet Isol Damper | 1V-AD-13B | Ind Light | R | R | | | |

Reference Only

## SECONDARY CONTAINMENT ISOLATION DAMPERS
## 1C-23
## (Continued)

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Rx Bldg to SBGT Inlet Vlv | AV-7602A | Ind Light | G | G | | | |
| Rx Bldg to SBGT Inlet Vlv | AV-7602B | Ind Light | G | G | | | |
| Refuel Pool to Vent Shaft Inlet Vlv | AV-7604V | Ind Light | G | G | | | |
| Refuel Pool to SBGT Inlet Vlv | AV-7604U | Ind Light | G | G | | | |
| OG Retention Bldg to SBGT Isol Vlv | AV-7605A | Ind Light | R | R | | | |
| OG Retention Bldg to SBGT Isol Vlv | AV-7605B | Ind Light | R | R | | | |
| Refuel Pool Exh Fan Inlet Isol Damper | 1V-AD-14A | Ind Light | R | R | | | |
| Refuel Pool Exh Fan Inlet Isol Damper | 1V-AD-14B | Ind Light | R | R | | | |

Reference Only

## SAFETY SYSTEMS HVAC
## 1C-23

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| A RHR/CS Rm Clg Unit | 1V-AC-12 | Ind Light | G or R | G | | | |
| | | HS | A or Start | A | | | |
| HPCI Room Clg Unit | 1V-AC-14A | Ind Light | G or R | G | | | |
| | | HS | A or Start | A | | | |
| RCIC Room Clg Unit | 1V-AC-15A | Ind Light | G or R | G | | | |
| | | HS | A or Start | A | | | |
| A Diesel Gen 1G-31 Rm Outside Air Intake Damper | ZS-7000A1 | Ind Light | G | G | | | |
| A Diesel Gen 1G-31 Rm Exhaust Air Louvers | ZS-7002A1/A3 | Ind Light | G | G | | | |
| A Diesel Gen 1G-31 Rm Supply Fan | 1V-SF-20 | Ind Light | G | G | | | |
| B RHR/CS Rm Clg Unit | 1V-AC-11 | Ind Light | G or R | G | | | |
| | | HS | A or Start | A | | | |
| HPCI Room Clg Unit | 1V-AC-14B | Ind Light | G or R | G | | | |
| | | HS | A or Start | A | | | |
| RCIC Room Clg Unit | 1V-AC-15B | Ind Light | G or R | G | | | |
| | | HS | A or Start | A | | | |
| B Diesel Gen 1G-21 Rm Outside Air Intake Damper | ZS-7000B1 | Ind Light | G | G | | | |
| B Diesel Gen 1G-21 Rm Exhaust Air Louvers | ZS-7002B1/B3 | Ind Light | G | G | | | |
| B Diesel Gen 1G-21 Rm Supply Fan | 1V-SF-21 | Ind Light | G | G | | | |

## DRYWELL COOLING
## 1C-25

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Loop A Supply | CV-5718A | Ind Light | R | R | | | (TS) |
| Loop A Return | CV-5704A | Ind Light | R | R | | | (TS) |
| Loop A Mode Select | HS-5718A | HS | Start | START | | | |
| Group 7 Channel A DW Cooling And Fan Speed Override | HS-4321A | HS | N | N | | | |
| Loop B Supply | CV-5718B | Ind Light | R | R | | | (TS) |
| Loop B Return | CV-5704B | Ind Light | R | R | | | (TS) |
| Loop B Mode Select | HS-5718B | HS | Start | START | | | |
| Group 7 Channel B DW Cooling And Fan Speed Override | HS-4321B | HS | N | N | | | |

Reference Only

## A STANDBY GAS TREATMENT
## 1C-24

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| A SBGT Mode Select | HS-5814A | HS | A | A | | | |
| Inboard Isolation Lockout Relay | L/R-5830A | Lockout Relay | RST | RST | | | |
| Cooldown/Outside Air Vlv | AV-5801A | Ind Light | G | G | | | |
| Intake Valve | AV-5825A | Ind Light | R | R | | | |
| Constant Heater | EC-5805A | Ind Light | G | G | | | |
| | HS-5805A | HS | On | ON | | | |
| Fan Inlet Valve | AV-5815A | Ind Light | R | R | | | |
| Exhaust Fan | 1V-EF-15A | Ind Light | G | G | | | |
| Discharge Valve | AV-5817A | Ind Light | R | R | | | |
| Variable Heater ΔT Controller | DTIC-5805A | Ind Light | G | G | | | |
| | | Select Sw | A | A | | | |
| | | Tape | 16° | 16 | | | |
| | | Output Meter | ≥ 100% | >100 | | | |
| Inlet Air Flow Controller | FIC-5828A | Select Sw | A | A | | | |
| | | Tape | 3800 ± 20 | 3800 | | | |
| | | Output Meter | ≥ 100% | >100 | | | |
| OG Stack Exh fan | 1V-EF-18A | Ind Light | G or R | R | | | |
| A SBGT Total Run Time | SBGT Run Time Log | Total Run Time | <720 hours | N/A | | | Only required if A SBGT is in operation, otherwise N/A |

## B STANDBY GAS TREATMENT
## 1C-24

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| B SBGT Mode Select | HS-5814B | HS | A | A | | | |
| Outboard Isolation Lockout Relay | L/R-5830B | Lockout Relay | RST | RST | | | |
| Cooldown/Outside Air Vlv | AV-5801B | Ind Light | G | G | | | |
| Intake Valve | AV-5825B | Ind Light | R | R | | | |
| Constant Heater | EC-5805B | Ind Light | G | G | | | |
| | HS-5805B | HS | On | ON | | | |
| Fan Inlet Valve | AV-5815B | Ind Light | R | R | | | |
| Exhaust Fan | 1V-EF-15B | Ind Light | G | G | | | |
| Discharge Valve | AV-5817B | Ind Light | R | R | | | |
| Variable Heater ΔT Controller | DTIC-5805B | Ind Light | G | G | | | |
| | | Select Sw | A | A | | | |
| | | Tape | 16° | 16 | | | |
| | | Output Meter | ≥ 100% | >100 | | | |
| Inlet Air Flow Controller | FIC-5828B | Select Sw | A | A | | | |
| | | Tape | 3800 ± 20 | 3800 | | | |
| | | Output Meter | ≥ 100% | >100 | | | |
| OG Stack Exh Fan | 1V-EF-18B | Ind Light | G or R | G | | | |
| B SBGT Total Run Time | SBGT Run Time Log | Total Run Time | <720 hours | N/A | | | Only required if B SBGT is in operation, otherwise N/A |

Reference Only

## PASS VALVES
## 1C-24

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| PASS Sample Station Exh Isol Valve | AV-8773A | Ind Light | R | R | | | |
| PASS Sample Station Exh Isolation Override | HS-8773A | HS | N | N | | | |
| PASS Sample Station Exh Isol Valve | AV-8773B | Ind Light | R | R | | | |
| PASS Sample Station Exh Isolation Override | HS-8773B | HS | N | N | | | |

## CONTAINMENT MONITORING
## 1C-29

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Inbd Loop A Jet Pump Sample Isol | SV-4594A | Ind Light | G | | | | (TS) |
| | | HS | RST | | | | |
| Outbd Loop A Jet Pump Sample Isol | SV-4595A | Ind Light | G | | | | (TS) |
| | | HS | RST | | | | |
| Inbd Liq Sample Return To Torus Isol | SV-8772A | Ind Light | G | | | | (TS) |
| | | HS | RST | | | | |
| DW Torus Rad Monitor 1C219A (One Sample Point Selected) | Torus | Ind Light | On/Off | | | | |
| | Drywell #1 | Ind Light | On/Off | | | | |
| | Drywell #2 | Ind Light | On/Off | | | | |
| Sample Flow Trouble | | Ind Light | Off | | | | |
| Outboard Sample Isolation Valves | HS-8101A | HS | A | | | | |
| Inboard Sample Isolation Valves | HS-8100A | HS | A | | | | |
| Inbd Loop B Jet Pump Sample Isol | SV-4594B | Ind Light | G | | | | (TS) |
| | | HS | RST | | | | |
| Outbd Loop B Jet Pump Sample Isol | SV-4595B | Ind Light | G | | | | (TS) |
| | | HS | RST | | | | |
| Outbd Liq Sample Return To Torus Isol | SV-8772B | Ind Light | G | | | | (TS) |
| | | HS | RST | | | | |
| DW Torus Rad Monitor 1C219B (One Sample Point Selected) | Torus | Ind Light | On/Off | | | | |
| | Drywell #1 | Ind Light | On/Off | | | | |
| | Drywell #2 | Ind Light | On/Off | | | | |
| Sample Flow Trouble | | Ind Light | Off | | | | |
| Inboard Sample Isolation Valves | HS-8100B | HS | A | | | | |
| Outboard Sample Isolation Valves | HS-8101B | HS | A | | | | |

Reference Only

## OFFGAS
## 1C-34

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Offgas System Bypass Switch | HS-1378A | HS | N | N | | | |

## SBLC SQUIB VALVES
## 1C-05(back of panel, right side of center section)

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Squib Continuity Meter | KY-2611 | Meter | ≥ 2 ma | >2mA | | | (TS) |
| Squib Continuity Meter | KY-2612 | Meter | ≥ 2 ma | >2mA | | | (TS) |

## OVERRIDES
## 1C-04

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| RHR Logic Bypass Switch | HS-4690B | HS | N | N | | | |
| RHR Logic Bypass Switch | HS-4690A | HS | N | N | | | |

## TIP SQUIB VALVES
## 1C-13

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Channel A Valve Control | Squib Monitor | Amber Light | OFF | OFF | | | (TS) |
| | Ball Valve | Ind Light | G | G | | | (TS) |
| Channel B Valve Control | Squib Monitor | Amber Light | OFF | OFF | | | (TS) |
| | Ball Valve | Ind Light | G | G | | | (TS) |
| Channel C Valve Control | Squib Monitor | Amber Light | OFF | OFF | | | (TS) |
| | Ball Valve | Ind Light | G | G | | | (TS) |

## STEAM LEAK DETECTION OVERRIDES
## 1C-21

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| A RCIC Temp Isol Override/Test | B21B-S5A | HS | N | N | | | |
| A HPCI Temp Isol Override/Test | B21B-S6A | HS | N | N | | | |
| B RCIC Temp Isol Override/Test | B21B-S5B | HS | N | N | | | |
| B HPCI Temp Isol Override/Test | B21B-S6B | HS | N | N | | | |

Reference Only

## OVERRIDES
## 1C-18

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| RWCU Hi Diff Flow Isol Override | HS-2749B | HS | N | N | | | |
| RWCU Ambient Temps Isol Override | HS-2764 | HS | N | N | | | |
| RFP Hi RPV Water Level Override | HS-1632 | HS | N | N | | | |

## OVERRIDES
## 1C-15

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Group 1 Channel A1 All Signals Override | HS-4427A | HS | N | N | | | |
| RPS Channel A1 Override | C71A-S15A | HS | N | N | | | |
| Group 3 Channel A Hi DW And RX Lo Level Override | HS-4315A | HS | N | N | | | |
| Group 3 Channel A All Signals Override | HS-4356A | HS | N | N | | | |
| RPS Alternate Power Transfer C71B-S1A | A-MG | In Light | W | W | | | |
| | ALT XFMR | In Light | W | W | | | |
| Group 1 Channel A1 Reactor Lo-Lo-Lo Level Override | HS-4535 | HS | N | N | | | |
| Group 1 Channel A2 Reactor Lo-Lo-Lo Level Override | HS-4536 | HS | N | N | | | |
| RPS Channel A2 Override | C71A-S15C | HS | N | N | | | |
| Group 1 Channel A2 All Signals Override | HS-4427C | HS | N | N | | | |
| Bypass Switch, Channel A2 | HS-4463B | HS | N | N | | | |
| Bypass Switch, Channel A1 | HS-4463A | HS | N | N | | | |
| Bypass Switch, Channel A1 | HS-4566A | HS | N | N | | | |
| Bypass Switch, Channel A2 | HS-4566B | HS | N | N | | | |

Reference Only

## OVERRIDES
## 1C-17

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Group 1 Channel B1 All Signals Override | HS-4427B | HS | N | N | | | |
| RPS Channel B1 Override | C71A-S15B | HS | N | N | | | |
| Group 3 Channel B Hi DW And RX Lo Level Override | HS-4315B | HS | N | N | | | |
| Group 3 Channel B All Signals Override | HS-4356B | HS | N | N | | | |
| RPS Alternate Power Transfer C71B-S1B | B-MG | In Light | W | W | | | |
| | ALT XFMR | In Light | W | W | | | |
| Group 1 Channel B1 Reactor Lo-Lo-Lo Level Override | HS-4537 | HS | N | N | | | |
| Group 1 Channel B2 Reactor Lo-Lo-Lo Level Override | HS-4538 | HS | N | N | | | |
| RPS Channel B2 Override | C71A-S15D | HS | N | N | | | |
| Group 1 Channel B2 All Signals Override | HS-4427D | HS | N | N | | | |
| Bypass Switch, Channel B2 | HS-4463D | HS | N | N | | | |
| Bypass Switch, Channel B1 | HS-4463C | HS | N | N | | | |
| Bypass Switch, Channel B1 | HS-4566C | HS | N | N | | | |
| Bypass Switch, Channel B2 | HS-4566D | HS | N | N | | | |

## OVERRIDES
## 1C-19

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| RWCU Hi Diff Flow Isol Override | HS-2749A | HS | N | N | | | |
| RWCU Ambient Temps Isol Override | HS-2765 | HS | N | N | | | |

Reference Only

## OVERRIDES
## 1C-30

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Lo Stm Press Isol Override | E51A-SA | HS | N | N | | | |
| MO2401 Auto Open Signal and RPV Hi Level Override | HS-2437 | HS | N | N | | | |

## OVERRIDES
## 1C-39

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| HPCI Torus Hi Level Suction Transfer | HS-2319 | HS | N | N | | | |
| HPCI Logic B Lo Stm Line Press, Hi Wtr Lvl & MO2239 Auto Open Override | HS-2229B | HS | N | N | | | |
| CST Lo Level Bypass Switch | HS-5249A | HS | N | N | | | |

## OVERRIDES
## 1C-33

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| RCIC Lo Stm Press Isol Override | E51A-SB | HS | N | N | | | |
| Group 5 Outboard Isolation Override | HS-2710B | HS | N | N | | | |
| Group 2 MO1937 Isolation Override | HS-1937B | HS | N | N | | | |
| MO2400 Auto Open Signal Override | HS-2400A | HS | N | N | | | |

Reference Only

## OVERRIDES
## 1C-32

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Group 5 Inboard Isolation Override | HS-2710A | HS | N | N | | | |
| Group 2 MO1936 Isolation Override | HS-1936A | HS | N | N | | | |
| CV4300 Hard Pipe Vent Alt Pwr/PCIS Override | HS-4300A | HS | N | N | | | |
| HPCI Logic A Lo Stm Line Press & MO2238 Auto Open Override | HS-2229A | HS | N | N | | | |

## SAFETY PARAMETER
## 1C-407A

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| SPDS Video Display Check - all displays Viewed | Top Level | Computer Displays | SAT | SAT | | | |
| | Second Level | Computer Displays | SAT | SAT | | | |
| | Third Level | Computer Displays | SAT | SAT | | | |

## PCIS STATUS BOARD
## 1C-04

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| CIMS A Logic Power Available | | Ind Light | W | | | | |
| CIMS B Logic Power Available | | Ind Light | W | | | | |
| CIMS Panel | | Check | No Isol | | | | |
| CIMS Lamp Test | | Test | SAT | | | | |
| A Logic PCIS Status Board Alarming Typer | 1st | Check | SAT | | | | |
| | 2nd | Check | SAT | | | | |
| B Logic PCIS Status Board Alarming Typer | 1st | Check | SAT | | | | |
| | 2nd | Check | SAT | | | | |

Reference Only

## ANNUNCIATORS

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Annunciators | 1C40A | Check | SAT | SAT | | | |
| | 1C40 | Check | SAT | SAT | | | |
| | 1C-14 | Check | SAT | SAT | | | |
| | 1C-35A | Check | SAT | SAT | | | |
| | 1C-35B | Check | SAT | SAT | | | |
| | Seismic Alm | Check | SAT | SAT | | | |
| | 1C-03 | Check | SAT | SAT | | | |
| | 1C-04 | Check | SAT | SAT | | | |
| | 1C-05 | Check | SAT | SAT | | | |
| | 1C-06 | Check | SAT | SAT | | | |
| | 1C-07 | Check | SAT | SAT | | | |
| | 1C-08 | Check | SAT | SAT | | | |
| | 1C-09B | Check | SAT | SAT | | | |
| | 1C-09A | Check | SAT | SAT | | | |
| | 1C-26A | Check | SAT | SAT | | | |
| | 1C-26B | Check | SAT | SAT | | | |
| | 1C-22 | Check | SAT | SAT | | | |
| | 1C-23A | Check | SAT | SAT | | | |
| | 1C-23B | Check | SAT | SAT | | | |
| | 1C-23C | Check | SAT | SAT | | | |
| | 1C-25A | Check | SAT | SAT | | | |
| | 1C-25B | Check | SAT | SAT | | | |
| | 1C-24A | Check | SAT | SAT | | | |
| | 1C-24B | Check | SAT | SAT | | | |
| | 1C-34 | Check | SAT | SAT | | | |

## RECORDERS

| DESCRIPTION | EQUIP ID | FEATURE | DESIRED | SHIFT 1 | SHIFT 2 | | REMARKS |
|---|---|---|---|---|---|---|---|
| Recorders | Control Room | Check | SAT | SAT | | | |
| | SANSAO Tour Area | Check | SAT | SAT | | | |
| | NSAO Tour Area | Check | SAT | SAT | | | |

Reference Only

# *DUANE ARNOLD ENERGY CENTER*

## JOB PERFORMANCE MEASURE

**NUMBER: 2.1.33-03 (294001-10)**

**TASK NUMBER: 97.11 STA 3.01**

**TITLE: Limiting Control Rod Pattern Determination Using STP 3.0.0-01**

**Rev. 1**

DEVELOPED BY: _____ Instructor  10/12/2000 Date

VALIDATED BY: _____ SME/Instructor  10/13/00 Date

REVIEWED BY: _____ Plant Reviewer  10-16-00 Date

APPROVED BY: _____ Training Supervisor-Operations  10/16/00 Date

# DUANE ARNOLD ENERGY CENTER

## JOB PERFORMANCE MEASURE

| | | |
|---|---|---|
| **JPM No.** 2.1.33-03 | **JPM Description:** Limiting control rod pattern determination using STP 3.0.0-01 (faulted) | |
| **Task No.** 97.11 | **Task Description:** Perform daily and shift instrument checks | |
| **K/A Reference:** 2.1.33 | 2.1.33 3.4/4.0 | |
| APPLICABLE METHOD OF TESTING: RO/SRO | | |
| Simulate Performance | Actual Performance X | |
| Simulator X | In-Plant | Control Room |
| Time for Completion: 10 minutes | | |

# JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

**NOTE**

All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 7 through 10.

JPM No. 2.1.33-03 JPM Title Limiting control rod pattern determination using STP 3.0.0-01 (faulted)

MRP 1. Task description and number, JPM description and number are identified

MRP 2. Task elements identified and K/A references are included

MRP 3. Performance location specified

a. in-plant

b. control room

c. simulator

MRP 4. Initial conditions and cues identified

a. setup, required materials, and procedure

b. malfunctions and instructor actions

c. initiating and terminating cues

MRP 5. Task standards identified and verified by SME review

MRP 6. Critical tasks/steps identified meet criteria and identified with a

MRP 7. Verify JPM steps fit the most current procedures
Procedure Rev. 24 Date 8/31/00

MRP 8. Pilot test JPM

a. verify cues both verbal and visual are free of conflict

b. ensure performance time is accurate

9. If the JPM cannot be performed as written with proper responses, then revise the JPM

_____ 10. When JPM is revalidated, SME/Instructor signs and dates JPM

SME/Instructor Date

SME/Instructor Date

SME/Instructor Date

**SIMULATOR SETUP:** Any full power IC.

**EVENT TRIGGERS**

None

**MALFUNCTIONS:**

| Time | Malfunction No. | Malfunction Title | ET | Delay | F. Sev. | Ramp | I. Sev. |
|---|---|---|---|---|---|---|---|
| 0 | FW14A | "A" FW FLOW XMTR FAILURE | NA | 0 | 0 | NA | NA |

**OVERRIDES:**

| Time | Override Tag | Override Description | ET | Delay | Value | Ramp |
|---|---|---|---|---|---|---|
| 0 | DI FW HSS-4450 | 1/3 ELEM SW | NA | NA | 1-Elem | |
| 0 | AO FW FI-1581 | "A" FW FLOW IND. | NA | NA | AS IS | |
| 0 | AO FW FT-4450B | TOTAL FW FLOW RECORDER | NA | NA | AS IS | |

**REMOTE FUNCTIONS:**

None

## INSTRUCTOR ACTIONS:

1. Insert overrides listed on table above.
2. Insert malfunction listed on table.
3. Read initial conditions and initiating cues to the operator.
4. Provide a copy of Official Case to the student if necessary.

## TASK STANDARDS:

1. Operator obtains an "Official 3D Case" from the process computer.
2. Determines that the "Official 3D Case" is invalid by noting that Core Thermal Power (MWT) is lower than expected and informs the OSS.

## REQUIRED MATERIALS:

Copy of "Official 3D Case"
Copy of STP 3.0.0-01, Instrument Checks"

## GENERAL REFERENCES:

STP 3.0.0-01, Instrument Checks"

**Read to the operator the following information:**

INITIAL CONDITIONS:

1. The plant is operating at 100% power.

INITIATING CUES:

1. The OSS directs you to perform the "Limiting Control Rod Pattern Determination, RBM operability and MFLCPR Surveillance" section of STP 3.0.0-01 and report the results.

**This task is not time critical.**

**Inform the evaluator when you have completed the task.**

## PERFORMANCE INFORMATION

| NOTE: |
|---|
| Critical steps are denoted with a "C". Failure to meet the standard for this step constitutes failure. |

Time Start _____

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: | Obtains a copy of Instrument Checks (STP 3.0.0-01) |
| STANDARD: | Obtains a copy of Instrument Checks (STP 3.0.0-01) |
| COMMENTS:<br><br>Cue: When the operator goes to the "hanging files" to get a copy of STP 3.0.0-01, provide a copy of the STP for the operator. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Operator obtains an "Official 3D Case." |
| STANDARD: | Operator obtains an "Official 3D Case" from the process computer. |
| COMMENTS:<br><br>Cue: If the simulator PPC is not working, provide the operator with the "Official 3D Case" attached to the JPM. | |

| | |
|---|---|
| PERFORMANCE STEP:<br>Critical: C | Determines that the "Official 3D Case" is invalid. |
| STANDARD: | Determines that the "Official 3D Case" is invalid by noting that core thermal power (MWT) is lower than expected and informs the OSS. |
| COMMENTS:<br><br>Cue: If the operator does not recognize that the process computer data is invalid and completes the determination, role play as the OSS and acknowledge the report that the reactor is not on a limiting control rod pattern. | |

Time Stop _____

**TERMINATING CUES:** When the operator informs you as the OSS that the thermal limits cannot be determined from the process computer, acknowledge the report and inform him that the STA will run a P1 check and the reactor engineer will be contacted. If the operator reports that the reactor is not on a limiting control rod pattern and reports that the task is completed, acknowledge the report.

## VERIFICATION OF COMPLETION

JPM No.: 2.1.33-03 JPM Description: Limiting control rod pattern determination using STP 3.0.0-01 (faulted)

Operator: _____ Evaluator: _____

Licensee: ☐ RO ☐ SRO ☐ SRO Cert
☐ STA ☐ NSPEO

Result: ☐ SATISFACTORY ☐ UNSATISFACTORY

**COMMENTS/FEEDBACK:** (Note any trainee discrepancies or misperformed steps.)

_____

_____

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_____

_____ _____
Evaluator's Signature Date

>>>> SIMULATOR <<<<
3D MONICORE
PERIODIC LOG

SEQUENCE NO 14
13-OCT-2000 13:41 CALCULATED
13-OCT-2000 13:41 PRINTED
CASE ID FMLD1001013134122
RESTART FMLD1001013134122
LPRM ABSOLUTE - FULL CORE

CORE PARAMETERS

| | | |
|---|---|---|
| POWER | MWT | 924. |
| POWER | MWE | 561. |
| FLOW | MLB/HR | 44.691 |
| FPAPDR | | 0.909 |
| SUBC | BTU/LB | 11.52 |
| PR | PSIa | 1022.1 |
| CORE | MWD/sT | 16353.7 |
| CYCLE | MWD/sT | 4163.7 |
| MCPR | | 2.239 |

CALC RESULTS

| | |
|---|---|
| Keff | 1.0000 |
| XE WORTH % | -2.41 |
| XE/RATED | 1.00 |

LOAD LINE SUMMARY

| | |
|---|---|
| CORE POWER | 55.7% |
| CORE FLOW | 91.2% |
| LOAD LINE | 56.5% |

CORRECTION FACTOR: MFLCPR= 1.168 MFLPD= 1.000 MAPRAT= 0.779
OPTION: ARTS DUAL LOOP MANUAL FLOW MCPRLIM= 1.400

MOST LIMITING LOCATIONS (NON-SYMMETRIC)

| MFLCPR | LOC | MFLPD | LOC | MAPRAT | LOC | PCRAT | LOC |
|---|---|---|---|---|---|---|---|
| 0.558 | 19-32 | 0.318 | 13-26- 5 | 0.449 | 13-20- 5 | 0.384 | 31-26- 5 |
| 0.549 | 19-14 | 0.309 | 31-26- 5 | 0.440 | 13-26- 5 | 0.375 | 13-26- 5 |
| 0.540 | 25-32 | 0.300 | 31-20- 5 | 0.431 | 31-26- 5 | 0.366 | 25-14- 5 |
| 0.531 | 25-14 | 0.284 | 25-14- 5 | 0.422 | 31-20- 5 | 0.353 | 31-20- 5 |
| 0.521 | 25-22 | 0.276 | 19-14- 5 | 0.405 | 25-14- 5 | 0.340 | 25-32- 5 |
| 0.512 | 25-24 | 0.267 | 25-32- 5 | 0.396 | 19-14- 5 | 0.331 | 19-14- 5 |
| 0.502 | 23-20 | 0.243 | 29-32- 5 | 0.387 | 19-32- 5 | 0.315 | 29-14- 5 |
| 0.493 | 23-26 | 0.234 | 29-14- 5 | 0.372 | 29-14- 5 | 0.303 | 29-32- 5 |
| 0.484 | 21-26 | 0.225 | 15-32- 5 | 0.363 | 15-32- 5 | 0.294 | 15-14- 5 |
| 0.475 | 21-20 | 0.216 | 15-14- 5 | 0.354 | 15-14- 5 | 0.285 | 15-32- 5 |

SEQ. A-1 C=MFLCPR D=MFLPD M=MAPRAT P=PCRAT *=MULTIPLE

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | | | | | | | | | | | |
| L | | | | | | | | | | | |
| 39 | | | | | | | | | | | |
| 35 | | | | | 36 | | 36 | | | | |
| L | | | | | | | | | | | |
| 31 | | | | | C | | | | | | |
| 27 | | | 36 D | | 00 | | 00 | | P 36 | | |
| L | | | | | | | | | | | |
| 23 | | | | | | | | | | | |
| 19 | | | 36 M | | 00 | | 00 | | 36 | | |
| L | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 11 | | | | | 36 | | 36 | | | | |
| L | | | | | | | | | | | |
| 07 | | | | | | | | | | | |
| 03 | | L | | L | | L | | L | | L | |
| 02 | 06 | 10 | 14 | 18 | 22 | 26 | 30 | 34 | 38 | 42 | |

CORE AVE AXIAL

| NOTCH | REL PW | LOC |
|---|---|---|
| | 0.274 | 25 |
| 00 | 0.548 | 24 |
| 02 | 0.690 | 23 |
| 04 | 0.833 | 22 |
| 06 | 0.901 | 21 |
| 08 | 0.970 | 20 |
| 10 | 0.987 | 19 |
| 12 | 1.005 | 18 |
| 14 | 1.020 | 17 |
| 16 | 1.034 | 16 |
| 18 | 1.031 | 15 |
| 20 | 1.028 | 14 |
| 22 | 1.042 | 13 |
| 24 | 1.055 | 12 |
| 26 | 1.077 | 11 |
| 28 | 1.099 | 10 |
| 30 | 1.145 | 09 |
| 32 | 1.191 | 08 |
| 34 | 1.222 | 07 |
| 36 | 1.252 | 06 |
| 38 | 1.237 | 05 |
| 40 | 1.222 | 04 |
| 42 | 0.992 | 03 |
| 44 | 0.763 | 02 |
| 46 | 0.381 | 01 |

CORE AVERAGE RADIAL POWER DISTRIBUTION

| RING # | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| REL PW | 1.143 | 1.081 | 1.262 | 1.185 | 1.089 | 0.686 |

>>>> SIMULATOR <<<< INSTRUMENT READINGS/STATUS
CALIBRATED LPRM READINGS

SEQUENCE NO 14
13-OCT-2000 13:41 CALCULATED
13-OCT-2000 13:41 PRINTED
CASE ID FMLD1001013134122
LPRM ABSOLUTE - FULL CORE

| | | | | | |
|---|---|---|---|---|---|
| 41D | | 20.9 | 28.5 | | |
| C | | 24.8 | 33.9 | | |
| B | | 25.3 | 34.6 | | |
| A | | 28.3 | 38.7 | | |
| 33D | 28.5 | 33.2C | 35.3 | 32.8 | |
| C | 33.9 | 42.8 | 45.7 | 39.8 | |
| B | 34.6 | 45.3 | 48.8 | 41.7 | |
| A | 38.7D | 45.4 | 47.6P | 43.2 | |
| 25D | 31.2 | 34.8 | 34.3 | 35.3 | 0.0 |
| C | 39.8 | 42.5 | 41.5 | 45.7 | 33.9 |
| B | 41.7 | 45.0 | 43.4 | 48.8 | 34.6 |
| A | 43.2M | 41.1 | 36.9 | 47.6 | 38.7 |
| 17D | 29.2 | 35.0 | 34.8 | 33.2 | 20.9 |
| C | 36.9 | 43.0 | 42.5 | 42.8 | 24.8 |
| B | 38.2 | 45.7 | 45.0 | 45.3 | 25.3 |
| A | 40.9 | 43.2 | 41.1 | 45.4 | 28.3 |
| 09D | 20.9 | 29.2 | 31.2 | 28.5 | |
| C | 24.8 | 36.9 | 39.8 | 33.9 | |
| B | 25.3 | 38.2 | 41.7 | 34.6 | |
| A | 28.3 | 40.9 | 43.2 | 38.7 | |
| | 08 | 16 | 24 | 32 | 40 |

# OF TIPS REJECTED: 2

FAILED SENSORS:
LPRM ( SIGNAL FAILED)
LPRM ( 1 PANACEA REJECTED)
4025D
OTHER SENSORS ( 0 TOTAL)
SUB RODS
NONE

T = TIP RUN RECOMMENDED
C = MFLCPR LOCATION
M = MAPRAT LOCATION
D = MFLPD LOCATION
P = PCRAT LOCATION
* = MULTIPLE LIMIT

CORE SUMMARY

| | | | | | |
|---|---|---|---|---|---|
| CORE POWER | 55.7% | CALC SUB FLOW | 91.0% | DP MEAS PSI | 20.55 |
| CORE FLOW | 91.2% | OPER SUB FLOW | -2.0% | DP CALC PSI | 21.96 |
| LOAD LINE | 56.5% | FLOW BASIS | MEAS | FEEDWTR FLOW MLB/HR | 3.97 |

APRM CALIBRATION

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| READING | 100.8 | 100.3 | 100.3 | 100.6 | 100.5 | 99.9 |
| AGAF | 0.553 | 0.557 | 0.556 | 0.555 | 0.556 | 0.557 |
| APRM - %CTP | 45.0 | 44.5 | 44.6 | 44.9 | 44.7 | 44.1 |

TIP RUNS RECOMMENDED
STRINGS: NONE

| PANEL NUMBER | FUNCTION | INSTRUMENT NUMBER | TECH SPEC | ACCEPTANCE CRITERIA | SHIFT 3 |
|---|---|---|---|---|---|
| N/A | Surveillance Frequency | N/A | SR 3.0.2 | Daily Instrument Checks shall be started after 1900 hours and shall be completed before 0100 hours. | Start Time _____<br>Completion Time _____<br>Operator's Initials _____ |
| N/A | Surveillance Frequency | N/A | | Daily Instrument Checks second reviews shall be completed before 0100 hours. | Time _____<br>Reviewer's Initials _____ |
| N/A | ♦Power Level | Computer Pt. C133 or Average of APRM Readings | N/A | Power Level should remain constant while Daily readings are being taken. If power changes or has to be changed, note this in Step 8.5. | ♦ |
| N/A | ♦ Feedwater Correction Factor | N/A | N/A | See Check Sheets (Attachment 6)<br>Note 1 | ♦ |
| Computer Console | ♦Limiting Control Rod Pattern Determination RBM Operability<br>(Note 2) | Most Limiting MCPR from Periodic Log (Note 3) | SR 3.2.2.1 | Within limits specified in the COLR. | ♦ |
| | | CORE POWER from Periodic Log | LCO 3.3.2.1 | | ♦ |
| | | Is Reactor operating on a limiting control rod pattern? (Yes/No) | | Determine if reactor is operating on a LCRP from the MCPR noted above. See Note 4 below | ♦ |
| | | RBM Operability | LCO 3.3.2.1 | See Note 5 below | ♦ |

Note 1: Should be performed daily when in Mode 1, but not required to be performed within the normal Tech Spec window. Attachment 6 should also be performed when directed by IPOI 3 or the OSS.

Note 2: N/A these checks if reactor power is < 25%. If the process computer is not available, contact the Reactor Engineer to obtain Thermal Limits.

Note 3: If the plant is in Single Loop Operation, obtain the Most Limiting MCPR from STP 3.4.1-02, Single Loop Operation Procedure.

Note 4: Per Tech Spec LCO 3.3.2.1 Bases, a LCRP exists for either of the following conditions:

30% ≤ Core Thermal Power < 90% and MCPR < 1.70 **OR** Core Thermal Power ≥ 90% and MCPR < 1.40

Note 5: When operating on a Limiting Control Rod Pattern, this blank shall be initialed to acknowledge the fact that RBM operability requirements of TECH SPEC 3.3.2.1 shall be met prior to control rod withdrawal (Otherwise N/A).

Reference Only

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Rod Block Monitor (continued)

The RBM Function satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

Two channels of the RBM are required to be OPERABLE, with their setpoints within the appropriate Allowable Value for the associated power range, to ensure that no single instrument failure can preclude a rod block from this Function. The actual setpoints are calibrated consistent with the DAEC Instrument Setpoint Methodology. The RBM Downscale Function is not required to have a specified Allowable Value setpoint, since this Function does not affect the Rod Withdrawal Error analysis (Ref. 3).

Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Values between successive CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor power), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., pressure switch) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. Analytical Limits, where established, are the limiting values of the process parameters used in safety analysis to define the margin to unacceptable consequences. Margin is provided between the Allowable Value and the Analytical Limits to allow for process, calibration (i.e., M&TE) and some instrument uncertainties. Additional margin is provided between the Allowable Value and the trip setpoint to allow for the remaining instrument uncertainties (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.

The RBM is assumed to mitigate the consequences of a RWE event when operating ≥ 30% RTP. Below this power level, the consequences of an RWE event will not exceed the MCPR SL and, therefore, the RBM is not required to be OPERABLE

(continued)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Rod Block Monitor (continued)

(Ref. 3). When operating < 90% RTP, analyses (Ref. 3) have shown that with an initial MCPR ≥ 1.70, no RWE event will result in exceeding the MCPR SL. Also, the analyses demonstrate that when operating at ≥ 90% RTP with MCPR ≥ 1.40, no RWE event will result in exceeding the MCPR SL (Ref. 3). Therefore, under these conditions, the RBM is also not required to be OPERABLE.

2. Rod Worth Minimizer

The RWM enforces a rod pattern which is consistent with the Banked Position Withdrawal Sequence (BPWS) to ensure that the initial conditions of the CRDA analysis are not violated. The analytical methods and assumptions used in evaluating the CRDA are summarized in References 4, 5, 6, and 7. The BPWS requires that control rods be moved in groups, with all control rods assigned to a specific group required to be within specified banked positions. Requirements that the control rod sequence is in compliance with the BPWS are specified in LCO 3.1.6, "Rod Pattern Control."

The RWM Function satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

Since the RWM is a hardwired system designed to act as a backup to operator control of the rod sequences, only one channel of the RWM is available and required to be OPERABLE (Ref. 7). Special circumstances provided for in the Required Action of LCO 3.1.3, "Control Rod OPERABILITY," and LCO 3.1.6 may necessitate bypassing the RWM to allow continued operation with inoperable control rods, or to allow correction of a control rod pattern not in compliance with the BPWS. The RWM may be bypassed as required by these conditions, but then it must be considered inoperable and the Required Actions of this LCO followed.

Compliance with the BPWS, and therefore OPERABILITY of the RWM, is required in MODES 1 and 2 when THERMAL POWER is ≤ 10% RTP, even though the RWM will enforce compliance with the BPWS when the reactor is at any power level. When THERMAL POWER is > 10% RTP, there is no possible control rod configuration that results in a control rod worth that could

(continued)