# INITIAL SUBMITTAL OF THE WALKTHROUGH JPMS

# FOR THE QUAD CITIES EXAMINATION - DEC 2002

Facility: Quad Cities | Date of Examination: 12-02-02
Exam Level (circle one): RO/SRO (I) | Operating Test Number: 1

B.1. Control Room Systems

| System / JPM Title | Type Code* | Safety Function |
|---|---|---|
| a. Reactor Building Ventilation / Bypass Reactor Building Ventilation Isolations. 288000 A2.01 3.3/3.4 | D, S, L | 9 |
| b. RCIC / RCIC Manual Initiation (Hardcard) with a turbine trip and recovery.(Important PRA task) 217000 A2.02 3.8/3.7 | N, A, S, L | 4 |
| c. A.C. Electrical Distribution / Supply Bus 14-1 from Bus 24-1. (Important PRA task SOER 83-6) 262001 A4.01 3.4/3.7 | N, S, L | 6 |
| d. Reactor Protection System / Perform a manual scram functional test with rod drifts requiring a reactor scram. 212000 A4.01 4.6/4.6 | M, A, S | 7 |
| e. Core Spray / Monthly Core Spray surveillance with failure of the minimum flow valve. 209001 A4.04 2.9/2.9 | D, A, S | 2 |
| f. Containment / Vent primary Containment due to high H2 with a failure of the Torus 2" vent to open. 500000 EA1.03 3.4/3.2 | N, A, S, L | 5 |
| g. Main Steam / Pressurize main Steam Lines. 239001 A4.01 4.2/4.0 | D, S, L | 3 |

B.2 Facility Walk-Through

| | | |
|---|---|---|
| a. Service Water / Align SSMP Room Cooler to Fire Header APE 295018 AA1.01 3.3/3.4 | D, R, L | 8 |
| b. Control Rod Hydraulic / Depressurize the Scram Air Header EPE 295037 EA1.05 3.9/4.0 | D, R | 1 |
| c. Residual Heat Removal Shutdown Cooling / Perform the Auxiliary Electric Room actions to start SDC.(Important PRA task) APE 295021 AA1.02 3.5/3.5 | D, L | 4 |

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow Power, (R)CA

Facility: Quad Cities
Date of Examination: 12-02-02
Exam Level (circle one): SRO (U)
Operating Test Number: 1

B.1 Control Room Systems

| System / JPM Title | Type Code* | Safety Function |
|---|---|---|
| a. | | |
| b. | | |
| c. | | |
| d. Reactor Protection System / Perform a manual scram functional test with rod drifts requiring a reactor scram. 212000 A4.01 4.6/4.6 | M, A, S | 7 |
| e. | | |
| f. Containment / Vent primary Containment due to high H2 with a failure of the Torus 2" vent to open. 500000 EA1.03 3.4/3.2 | N, A, S, L | 5 |
| g. Main Steam / Pressurize main Steam Lines. 239001 A4.01 4.2/4.0 | D, S, L | 3 |

B.2 Facility Walk-Through

| | | |
|---|---|---|
| a. Service Water / Align SSMP Room Cooler to Fire Header APE 295018 AA1.01 3.3/3.4 | D, R, L | 8 |
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| c. Residual Heat Removal Shutdown Cooling / Perform the Auxiliary Electric Room actions to start SDC.(Important PRA task) APE 295021 AA1.02 3.5/3.5 | D, L | 4 |

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow Power, (R)CA

Exelon
Nuclear

# Nuclear Generation Group

# Job Performance Measure

Bypass the Reactor Building Ventilation Isolation

JPM Number: B.1.a.

Revision Number: 1

Date: 9/2002

| | | |
|---|---|---|
| **Developed By:** | Instructor | 10/10/02 Date |
| **Validated By:** | SME or Instructor | 10/11/02 Date |
| **Review By:** | Operations Representative | 10-11-02 Date |

SRO

# Job Performance Measure (JPM)

## SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC 94 (rst 94 from zip disk).
2. **IC Description:** Shutdown reactor following a scram.

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

3. **Manual Actuation:**
   - Ensure that the QGA packet for QCOP 1600-17 is complete, including safety glasses, and in the drawer next to the ANSO desk.
4. **Malfunctions:**
   - Insert a group II Isolation using malfunction RP07A & RP07B ***(imf rp07a)&(imf rp07b)***
5. **Remotes:** NONE
6. **Overrides:** NONE
7. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.
8. This completes the setup for this JPM.

# Job Performance Measure (JPM)

## Revision Record (Summary)

Revision 0, This JPM is developed IAW guidelines established in NUREG 1021 Rev 8 ES-301 and Appendix C. This JPM meets the criteria of Category B.1 "Control Room Systems," for RO/SRO candidates.

Revision 1 The JPM was revised to incorporate validation time and comments.

**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section at the bottom of the page. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

- A small leak inside the U-1 Drywell has caused the pressure to increase to 3.5 psig.
- All automatic functions occurred as expected.
- The MSIV room temperature has increased to 164°F and the Unit Supervisor wants to restart the Reactor building ventilation per QGA 300.
- This JPM is NOT time critical.

INITIATING CUE

Bypass the Reactor building ventilation isolation on U-1 IAW QCOP 1600-17

**Provide examinee with:**

QGA support packet for QCOP 1600-17 when directed by cue.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

# Job Performance Measure (JPM)

JPM Start Time: 13:29

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| ***EVALUATOR: If this JPM is being simulated in the control room, DO NOT ALLOW THE CANDIDATE TO OPEN THE JUMPER PACKET!*** ***EVALUATOR: Disregard the above statement if the JPM is being performed in the simulator.*** | | | |
| ***CUE: Provide candidate with QGA support packet for QCOP 1600-17.*** | | | |
| *F.1.a. | Install 901-15 panel jumpers. | Installs/verbalizes placing jumper between pts 49 & 50 on terminal board "B". | [✓] [ ] [ ] |
| ***CUE: If jumper is not numbered, tell the candidate that the jumper number is # 22.*** | | | |
| F.1.a. | Record jumper number. | Records jumper number & checks QCOP 1600-17 step F.1.a. | [✓] [ ] [ ] |
| ***Evaluators Note: Verification steps may be performed when time permits and therefore are allowed to be performed out-of-sequence. If asked for verification, give a cue that the jumpers will be verified later.*** | | | |
| F.1.a.(1) | Verification. | Installation is verified. | [✓] [ ] [ ] |
| *F.1.b. | Install 901-15 panel jumpers. | Installs/verbalizes placing jumper between pts. 38 & 39 on terminal board "E". | [✓] [ ] [ ] |
| ***CUE: If jumper is not numbered, tell the candidate that the jumper number is # 23.*** | | | |
| F.1.b. | Record jumper number. | Records jumper number & checks QCOP 1600-17 step F.1.b. | [✓] [ ] [ ] |
| F.1.b.(1) | Verification | Verifier verifies installation. | [✓] [ ] [ ] |
| ***EVALUATOR: The candidate should inform you that the task is complete.*** | | | |

*CRITICAL STEP

JPM Stop Time: 13:35

# Job Performance Measure (JPM)

Operator's Name: _____

Job Title: RO ❑ SRO ❑

JPM Title: Bypass the Reactor Building Ventilation Isolation

JPM Number: B.1.a. Revision Number: 1

Task Number and Title:
SRN-1600-P25 Given a reactor plant in a QGA situation, perform/simulate installing and removing one of the following sets of jumpers in accordance with the indicated procedure.

K/A Number and Importance:
**K/A: 288000 A2.01** **Rating: 3.3/3.4**

**Suggested Testing Environment:** Simulator

**Actual Testing Environment:** ❑ Simulator ❑ Plant ❑ Control Room

**Testing Method:** ❑ Simulate ❑ Perform **Faulted:** ❑ Yes ■ No **Alternate Path:** ❑ Yes ■ No

**Time Critical:** ❑ Yes ■ No

**Estimated Time to Complete:** 6 minutes **Actual Time Used:** 8 minutes

**References:**
QCOP 1600-17 Rev. 3

# Job Performance Measure (JPM)

**EVALUATION SUMMARY:**
Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments:_____

_____

_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ Date: _____

Candidate Copy

QCOP 1600-17
UNIT 1(2)
REVISION 3

# BYPASSING GROUP II ISOLATION AND REACTOR BUILDING VENTILATION ISOLATION

| Tim Hanley | SHIFT OPERATIONS SUPVSR | 9.23.99 |
|---|---|---|
| APPROVAL SIGNATURE | TITLE | EFFECTIVE DATE |

## A. PURPOSE

The purpose of this procedure is to provide the necessary steps for jumpering out Containment and Reactor Building Ventilation Group II isolation signal.

## B. DISCUSSION

B.1. The performance of this procedure will disable the auto-start of SBGT, allow manual startup of the Reactor Building Ventilation System and will permit the opening of the following valves:

a. AO 1(2)-1601-23, DW VENT VLV.

b. AO 1(2)-1601-24, VENT TO RX BLDG EXH SYS.

c. AO 1(2)-1601-60, TORUS VENT VLV.

d. AO 1(2)-1601-61, TORUS 2-INCH VENT RLF VLV.

e. AO 1(2)-1601-62, DW 2-INCH VENT RLF VLV.

f. AO 1(2)-1601-63, VENT TO SBGTS.

g. AO 1(2)-1601-21, DW PRG VLV.

h. AO 1(2)-1601-22, DW OR TORUS PRG VLV.

i. AO 1(2)-1601-55, N2 PRG VAP VLV.

j. AO 1(2)-1601-56, TORUS PRG VLV.

k. AO 1(2)-1601-57, N2 MAKEUP VLV.

l. AO 1(2)-1601-58, TORUS MAKEUP VLV.

m. AO 1(2)-1601-59, DW MAKEUP VLV.

B.1. (cont'd)

n. AO 1(2)-8801-A, 02 ANALY DW VLV.

o. AO 1(2)-8801-B, 02 ANALY DW VLV.

p. AO 1(2)-8801-C, 02 ANALY DW VLV.

q. AO 1(2)-8801-D, 02 ANALY TORUS VLV.

r. AO 1(2)-8802-A, 02 ANALY DW VLV.

s. AO 1(2)-8802-B, 02 ANALY DW VLV.

t. AO 1(2)-8802-C, 02 ANALY DW VLV.

u. AO 1(2)-8802-D, 02 ANALY TORUS VLV.

v. AO 1(2)-8803, 02 ANALY VLV.

w. AO 1(2)-8804, 02 ANALY VLV.

x. AO 1(2)-5741A, RX BLDG INLT DAMPER.

y. AO 1(2)-5741B, RX BLDG INLT DAMPER.

z. AO 1(2)-5742A, RX BLDG OUTLT DAMPER.

aa. AO 1(2)-5742B, RX BLDG OUTLT DAMPER.

B.2. Step completion shall be documented by entering either initials, data, **OR** NA if stated conditions do **NOT** apply.

B.3. Verification steps within this procedure may be performed when time permits and therefore are allowed to be performed out-of-sequence.

## C. PREREQUISITES

C.1. QGA's **OR** SAMG's have directed use of this procedure. /

C.2. **Obtain** equipment packet from QGA equipment storage drawer. /

## D. PRECAUTIONS

D.1. **Exercise** caution when installing jumpers due to possible energized circuits.

## E. LIMITATIONS AND ACTIONS

None.

## F. PROCEDURE

**NOTE**

The following jumpers will maintain relays 595-133 and 595-134 energized and bypass Group 2 Isolation of valves to Reactor Building Ventilation, Drywell, Torus, and Oxygen Analyzers.

| | | JUMPER NO. | INIT |
|---|---|---|---|
| F.1. | **Install** jumpers in Panel 901(2)-15: | | |
| a. | Jumper on terminal board "B" between terminal 49 **AND** 50. | #1 | |
| | (1) Verification: | | |
| b. | Jumper on terminal board "E" between terminal 38 **AND** 39. | #12 | |
| | (1) Verification: | | |
| F.2. | **WHEN** removal of the jumpers are required, **THEN**: | | |
| a. | **Remove** the following jumpers in Panel 901(2)-15: | | |
| | (1) Jumper on terminal board "B" between terminal 49 **AND** 50. | # | |
| | (a) Verification: | | |
| | (2) Jumper on terminal board "E" between terminal 38 **AND** 39. | # | |
| | (a) Verification: | | |

F.3. **Place** this procedure in the Active Jumper and Block Installation Record as a record of jumper installation.

## G. ATTACHMENTS

None.

## H. REFERENCES

### H.1. Technical Specifications:

None.

### H.2. P&IDs:

None.

### H.3. Drawings:

a. 4E-1509A Sh 2 (4E-2509A Sh 2), Schematic Diagram P.C.I. System Atmospheric Control System Inboard.

b. 4E-1509B Sh 1 (4E-2509B Sh 1), Schematic Diagram P.C.I. System Atmospheric Control System Outboard.

### H.4. Manuals:

None.

### H.5. Procedures:

None.

### H.6. UFSAR:

None.

### H.7. Commitments:

None.

### H.8. Others:

a. BWR Owners Group Emergency Procedure and Severe Accident Guideline.

b. QCPWG (Procedure Writers Guide), Vol. 3.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

(Student Copy)

- A small leak inside the U-1 Drywell has caused the pressure to increase to 3.5 psig.
- All automatic functions occurred as expected.
- The MSIV room temperature has increased to 164°F and the Unit Supervisor wants to restart the Reactor building ventilation per QGA 300.
- This JPM is NOT time critical.

INITIATING CUE

Bypass the Reactor building ventilation isolation on U-1 IAW QCOP 1600-17

Exelon
Nuclear

# Nuclear Generation Group

# Job Performance Measure

RCIC Manual Initiation (Hardcard) with a Turbine Trip

JPM Number: B.1.b.

Revision Number: 1

Date: 9/2002

| | | |
|---|---|---|
| **Developed By:** | Greg Thomas<br>**Instructor** | 10/10/02<br>**Date** |
| **Validated By:** | [signature]<br>**SME or Instructor** | 10/11/02<br>**Date** |
| **Review By:** | M Swigle<br>**Operations Representative** | 10-11-02<br>**Date** |

# Job Performance Measure (JPM)

## SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC 94 (rst 94).
2. **IC Description**: Reactor stable after scram.
3. **Manual Actuation:**
   - Ensure that the RCIC system is in its normal standby lineup.
4. **Malfunctions:**
   - Simulate failure of the RCIC exhaust check valve to open by closing the exhaust line manual isolation valve using remote function (***mrf rc04r close***)
   - When prompted by the evaluator, reopen the valve using ***(mrf rc04r open)*** and give the report that the check valve appeared to be stuck closed but you have cycled it manually and it now is free to move. No damage and everything is satisfactory in the RCIC room.
   - When prompted by the evaluator, give report as NLO dispatched to RCIC room to verify the rupture diaphragm intact, report diaphragm is intact and all looks normal and satisfactory.
5. **Remotes:** NONE
6. **Overrides:** NONE
7. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.
8. This completes the setup for this JPM.

# Job Performance Measure (JPM)

## Revision Record (Summary)

Revision 0, This JPM is developed IAW guidelines established in NUREG 1021 Rev 8 ES-301 and Appendix C. This JPM meets the criteria of Category B.1 "Control Room Systems," for RO/SRO candidates.

Revision 1 The JPM was revised to incorporate validation time and comments.

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Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

- A loss of feedwater has resulted in a reactor scram and entry into QGA 100.
- The Unit Supervisor has decided that RCIC should be used to restore reactor water level.
- Hardcard use has been authorized by the Unit Supervisor.
- RCIC is in its normal standby lineup.
- This JPM is not time critical

INITIATING CUE

Manually initiate Unit 1 RCIC using the hardcard and inject into the reactor vessel.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

(Student Copy)

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- The Unit Supervisor has decided that RCIC should be used to restore reactor water level.
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NRC COPY #1

# Job Performance Measure (JPM)

JPM Start Time: _____

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| | Obtain hardcard for RCIC MANUAL STARTUP from the 901-4 panel. | Obtains hardcard for RCIC MANUAL STARTUP from the 901-4 panel. | [ ] [ ] [ ] |
| Hardcard step 1 | Manually initiates RCIC using the manual initiation pushbutton. | Depresses and holds the RCIC MAN INITIATION pushbutton on the 901-4 | [ ] [ ] [ ] |
| | Verifies the system lines up to inject. | Using indications on the 901-4 panel verifies system valves are lining up for injection. | [ ] [ ] [ ] |
| * | Identifies turbine trip on high exhaust pressure. | Identifies turbine trip by alarm 901-4 D-15 and cause is due to high exhaust pressure by alarm 901-4 C-14. | [ ] [ ] [ ] |
| 901-4 C-14 step B.1. | Verifies the automatic actions occurred. | Verifies that the MO 1-1301-60 MIN FLOW VLV and the MO 1-1301-STM TO TURB VLV are closed | [ ] [ ] [ ] |
| *901-4 C-14 step B.2. | Verifies steam exhaust check valve open by dispatching operator to RCIC room. | Verifies 1-1301-64 RCIC TURB EXH STOP CK VLV is open by dispatching NLO to RCIC room. | [ ] [ ] [ ] |
| 901-4 C-14 step B.3. | Determines if high torus pressure exists. | Determines that a high torus pressure does not exist as indicated on 1-1602-1 TORUS PRESS. | [ ] [ ] [ ] |
| 901-4 C-14 step B.4. | Determines if the exhaust diaphragm has ruptured. | Determines that the exhaust diaphragm has not ruptured by:<br>Absence of alarm 901-4 A-16<br>RCIC room temp normal on 901-21<br>RCIC room rads normal on 901-02<br>Dispatches NLO to RCIC room to verify that rupture diaphragm is intact. | [ ] [ ] [ ]<br>(← 901-11 (17) alarm) |

***Evaluator Note: Prompt the Simulator operator to provide cue from previously dispatched (step 901-4 C-14 B.2.) operator sent to inspect the exhaust line stop-check valve, that he found it stuck, but manually cycled it and it is now free to move. No damage, everything is sat.***
***Also have Simulator Operator provide cue as the NLO sent to inspect the rupture diaphragm (step 901-4 C-14 B.4.) that everything appears normal in the RCIC room and that the rupture diaphragm is intact.***

***In the next step, if the candidate seeks input from US, provide cue that condition has been corrected and RCIC operation is required.***

# Job Performance Measure (JPM)

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| 901-4 C-14 step B.5. | Determines cause of high exhaust pressure has been corrected and RCIC IS required for operation. Starts turbine trip recovery IAW QCOA 1300-01. | Determines cause of high exhaust pressure has been corrected and RCIC IS required for operation. Starts turbine trip recovery IAW QCOA 1300-01. | [ ] [ ] [ ] |
| QCOA 1300-01 step D.1. | Verifies automatic actions occurred. | Previously done in step B.1.of 901-4C-14 | [ ] [ ] [ ] |
| QCOA 1300-01 step D.2. | Determines if a trip or isolation occurred. | Previously determined by 901-4 C-14 and operator reports from the field. | [ ] [ ] [ ] |
| ***Evaluator Note: In the next step, the candidate may ask US if initiation signal should be reset to prevent system from autostarting following reset of the turbine trip.*** ***Provide cue that it is NOT desired to clear the initiation signal and reiterate need for RCIC injection.*** | | | |
| QCOA 1300-01 step D.4. | Determines that initiation signal has not cleared. | Determines that initiation signal is not cleared by alarm 901-4 D-16. | [ ] [ ] [ ] |
| *QCOA 1300-01 step D.7.b. | Resets the turbine trip. | Verifies high exhaust pressure trip signal clear, by absence of alarm 901-4 C-14, and resets turbine trip by depressing TURB RESET pushbutton. | [ ] [ ] [ ] |
| QCOA 1300-01 step D.9. | Restarts RCIC for injection IAW QCOP 1300-02 Hard Card. | Determines turbine trip is reset by absence of any alarms, and that RCIC is required for operation. References Hard card to restart system. | [ ] [ ] [ ] |
| * Hardcard step 1 | Manually initiates RCIC using the manual initiation pushbutton. | Depresses and holds the RCIC MAN INITIATION pushbutton on the 901-4 | [ ] [ ] [ ] |
| | Verifies the system lines up to inject. | Using indications on the 901-4 panel verifies system valves reposition and system is injecting at ~400 gpm. | [ ] [ ] [ ] |
| ***EVALUATOR: The candidate should inform you that the task is complete.*** | | | |

JPM Stop Time: _____

# Job Performance Measure (JPM)

Operator's Name: _____
Job Title: RO ❑ SRO ❑

JPM Title: RCIC Manual Initiation (Hardcard) with a Turbine Trip

JPM Number: B.1.b. Revision Number: 1

Task Number and Title:
SR-1300-P01, Given a reactor plant in an accident condition where RCIC fails to autostart and/or fails to start with the auto pushbutton, start RCIC for injection in accordance with QCOP-1300-02. (Important PRA Operator Action – starting RCIC terminates 13 of the top 200 Core Damage Sequences)

K/A Number and Importance:
**K/A**: 217000 A2.02 **Rating:** 3.8/3.7

**Suggested Testing Environment:** Simulator

**Actual Testing Environment:** ❑ Simulator ❑ Plant ❑ Control Room

**Testing Method:** ❑ Simulate ❑ Perform **Faulted:** ❑ Yes ■ No **Alternate Path:** ■ Yes ❑ No

**Time Critical:** ❑ Yes ■ No

**Estimated Time to Complete:** 30 minutes **Actual Time Used:** _____ minutes

**References:** QCOP 1300-02, Rev. 22
QCOA 1300-01 Rev 11
QCAN 901-4 C-14 Rev 1
QCAN 901-4 D-15 Rev 4
QCAN 901-4 D-16 Rev 6
QCAN 901-4 E-16 Rev 0

# Job Performance Measure (JPM)

**EVALUATION SUMMARY:**
Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments:_____

_____

_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____ (Print)

Evaluator's Signature: _____ Date: _____

DESCRIPTION RCIC TURBINE TRIP

RCIC TURBINE TRIP

SETPOINT Actual:

1. Low RCIC Pump suction pressure; 15" Hg vacuum.
   OR
2. High RCIC Turbine exhaust pressure; 25 psig.
   OR
3. Automatic RCIC Isolation.
   OR
4. Remote manual trip pushbutton depressed.

Tech Specs: None

SENSOR

1. PS 1(2)-1360-21-1
2. PS 1(2)-1360-26A/B
3. PS 1(2)-1360-9A/B/C/D
4. DPIS 1(2)-1360-1A/1B
5. TS 1(2)-1360-14A/B/C/D
6. Remote Pushbutton Trip 13A-S17.

A. AUTOMATIC ACTIONS

1. RCIC Trip

   a. MO 1(2)-1301-60, MIN FLOW VLV closes.

   b. MO 1(2)-1301-61, STM TO TURB VLV closes.

2. IF turbine trip was caused by RCIC Isolation signal, THEN MO 1(2)-1301-16, STM SPLY ISOL VLV and MO 1(2)-1301-17, STM SPLY ISOL VLV, will BOTH close.

B. OPERATOR ACTION

1. IF RCIC Turbine Trip was caused by a turbine trip signal AND is required for operation, THEN perform QCOA 1300-01.

2. IF RCIC Turbine Trip was caused by a manual trip AND is NO longer required for operation, THEN perform QCOP 1300-05.

C. PROBABLE CAUSES

1. Low CCST or Torus level.
2. RCIC Pump suction valve out of position.
3. High Torus Pressure.
4. Restriction in RCIC Turbine exhaust line.
5. Automatic RCIC Isolation.

D. REFERENCES

1. TS Section 3.5.3, RCIC System.
2. M-50 (M89), Diagram of RCIC Piping.
3. 4E-1484A(B) (4E-2484A(B)), Schematic Diag RCIC System Part 2, Unit 1 (Unit 2).
4. 4E-1575F (4E-2575F), Schematic Diagram Main Control Rm. Annun. Pnl. 901-4 Pt. 3 of 4, (Window 94).
5. C00396, Equipment Manual Reactor Core Isolation Cooling System (GEK- 9546).
6. QCOA 1300-01, RCIC Turbine Trip/Isolation Recovery.
7. QCOP 1300-05, RCIC System Shutdown.
8. QCPWG (Procedure Writers Guide), Vol 3.
9. Quad Cities Kardex File.

QCAN 901(2)-4 C-14
UNIT 1(2)
REVISION 1
SAFETY RELATED

| APPROVAL SIGNATURE | TITLE | EFFECTIVE DATE |
|---|---|---|
| R W Bay | Station Manager | 9-17-91 |

DESCRIPTION HIGH RCIC TURBINE EXHAUST DISCHARGE PRESSURE

SETPOINT Actual: 1. High RCIC Turbine exhaust pressure; 25 psig.

Tech Specs: None

| RCIC TURBINE EXHAUST DISCH HIGH PRESSURE |
|---|

SENSOR 1. PS 1(2)-1360-26A/B

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[ ]

WARNING

High RCIC Turbine exhaust pressure could cause a rupture of the RCIC Turbine exhaust diphragm resulting in radioactive steam leaks within the RCIC area. Caution must be used in entering these areas to prevent personnel injury or excess exposure.

[ ]

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A. AUTOMATIC ACTIONS

1. RCIC Turbine trip

   a. MO 1(2)-1301-60, MIN FLOW VLV closes.

   b. MO 1(2)-1301-61, STM TO TURB VLV closes.

B. OPERATOR ACTION

1. Verify the above AUTOMATIC ACTIONS occurred.

2. Verify 1(2)-1301-64, U-1(2) RCIC TURB EXH STOP CK VLV, (located high up on wall between RCIC Room and Torus on RCIC steam exhaust discharge piping) is open.

3. IF high Torus pressure exists, as indicated on 1(2)-1602-1 TORUS PRESS, THEN refer to applicable QGA procedure.

4. Determine if a rupture of the exhaust diaphragm has occurred as follows:

   a. IF Alarm 901(2)-4 A-16 , RCIC TURBINE EXH DIAPHRAGM HIGH PRESSURE is lit, this is indicative of a possible ruptured exhaust diaphragm.

   b. Monitor RCIC Room area temperatures on Panel 901(2)-21.

   c. Check area radiological conditions on Panel 901(2)-02.

   d. Dispatch an operator to inspect exhaust diaphragm.

5. IF the cause of high exhaust discharge pressure has been corrected, AND RCIC System is required for operation, THEN perform RCIC Turbine trip recovery per QCOA 1300-1.

6. IF the cause of high exhaust discharge pressure has been corrected, AND RCIC System is NOT required for operation, THEN place RCIC System into Standby Operation per QCOP 1300-1.

7. IF RCIC is inoperable, THEN perform QCOS 1300-2.

C. PROBABLE CAUSES

1. High Torus Pressure.

2. Restriction in the RCIC Turbine exhaust line leading to the Torus.

D. REFERENCES

1. M-50 (M89), Diagram of RCIC Piping.
2. 4E-1484C (4E-2484C), Schematic Diag RCIC System Part 3, Unit 1(2).
3. 4E-1575AM Pt. 3 of 6 (4E-2575AR) Pt. 4 of 9, Schematic Diagram Control Room Annun. Pnl. 901(2)-4 (Window 91).
4. QCOA 1300-1, RCIC Turbine Trip/Isolation Recovery.
5. QCOS 1300-2, RCIC Outage Report.
6. QCNPS Procedure Writers Guide, Rev. 1, January 31, 1990.
7. Quad Cities Kardex File.

# RCIC TURBINE TRIP/ISOLATION RECOVERY

A. SYMPTOMS

1. Possible RCIC trouble alarms:

   a. Panel 901(2)-4:

      (1) D-15, RCIC TURBINE TRIP.

      (2) G-15, RCIC TRIP THROTTLE VALVE CLOSED.

      (3) B-14, RCIC PUMP LOW SUCTION PRESSURE.

      (4) C-14, RCIC TURBINE EXHAUST DISCH HIGH PRESSURE.

      (5) E-16, RCIC LOW FLOW.

      (6) B-15, RCIC STEAM LINE ISOLATION.

      (7) A-15, RCIC STEAM LINE HIGH DP.

2. Possible RCIC System trouble:

   a. RCIC Turbine speed low or decreasing.

   b. FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, decreasing flow.

   c. GOVERNOR VLV AND/OR TRIP THROTTLE VLV closed.

   d. MO 1(2)-1301-16 and MO 1(2)-1301-17, STM SUPLY ISOL VLV, closed.

   e. Failure to maintain Reactor water level.

B. AUTOMATIC ACTIONS

1. IF RCIC Turbine trip is caused by Turbine overspeed, THEN RCIC TRIP THROTTLE VLV will close.

2. IF RCIC Turbine trip is NOT caused by Turbine overspeed, THEN MO 1(2)-1301-60, MIN FLOW VLV, and MO 1(2)-1301-61, STM TO TURB VLV, will BOTH close.

3. IF RCIC System isolation occurs, THEN the following valves will close:

   a. MO 1(2)-1301-16, STM SUPLY ISOL VLV.

   b. MO 1(2)-1301-17, STM SUPLY ISOL VLV.

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[

NOTE

The following two valves close due to Turbine trip logic.

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c. MO 1(2)-1301-60, MIN FLOW VLV.

d. MO 1(2)-1301-61, STM TO TURB VLV.

C. IMMEDIATE OPERATOR ACTIONS

1. None.

D. SUBSEQUENT OPERATOR ACTIONS

1. Verify the above AUTOMATIC ACTIONS occurred.

2. Determine if a trip or isolation occurred by checking position of MO 1(2)-1301-16 and MO 1(2)-1301-17, STM SUPLY ISOL VLV, open or closed:

   a. IF MO 1(2)-1301-16 and MO 1(2)-1301-17, STM SUPLY ISOL VLVS, are open, THEN perform the following to determine which RCIC Turbine trip has occurred:

      (1) Verify Reactor water level. IF level for Unit 1 greater than or equal to 54.23 inches or for Unit 2 greater than or equal to 50.34 inches, THEN cause of trip is Reactor high water level.

      (2) Verify position of TRIP THROTTLE VLV. IF closed, THEN trip caused by Turbine overspeed.

      (3) IF alarm B-14, RCIC PUMP LOW SUCTION PRESSURE is lit, THEN trip caused by RCIC Pump low suction.

      (4) IF alarm C-14, RCIC TURBINE EXHAUST DISCH HIGH PRESSURE is lit, THEN cause of trip is high Turbine exhaust pressure.

   b. IF MO 1(2)-1301-16 and MO 1(2)-1301-17 STM SUPLY ISOL VLV are closed, THEN a RCIC isolation has occurred.

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[ ]

CAUTION

IF RCIC Turbine trip due to high level, THEN RCIC will auto restart on Reactor low low water level initiation signal.

[ ]

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3. IF RCIC Turbine trip was caused by Reactor high water level trip signal OR manual shutdown, THEN NO action is required to reset the trip signal.

4. IF RCIC initiation signal is cleared, THEN depress INITIATION SIGNAL SEAL-IN AND RESET.

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[ ]

CAUTION

IF RCIC automatic initiation is still present, THEN when RCIC isolation and/or Turbine trip is reset RCIC will automatically restart. Water hammer may occur during auto-start after the isolation is reset.

[ ]

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5. IF the RCIC Turbine trip was due to a mechanical overspeed trip, THEN perform the following locally at the RCIC Turbine: (F-18)

   a. IF RCIC initiation signal seal-in was reset, THEN close MO 1(2)-1301-61, STM TO TURB VLV.

      (1) Verify closed MO 1(2)-1301-60, MIN FLOW VLV.

   b. Remove lockwire and manually close TRIP THROTTLE VLV.

   c. Reset mechanical trip mechanism by pulling trip linkage connecting the TRIP THROTTLE VLV and the trip mechanism on the outboard bearing towards the TRIP THROTTLE VLV.

   d. Slowly open (manually) the TRIP THROTTLE VLV.

   e. Lockwire open TRIP THROTTLE VLV handwheel to prevent inadvertent manual closing of valve.

6. IF trip was due to a RCIC low suction pressure, THEN check or align RCIC suction valve from CCST OR Torus as follows:

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[ ]

NOTE

IF either MO 1(2)-1301-25, TORUS PUMP SUCT VLV, OR MO 1(2)-1301-26, TORUS PUMP SUCT VLV, opens, THEN MO 1(2)-1301-53, CCST TEST BYP, will automatically close.

[ ]

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a. IF Torus level reaches +5 inches (AV ≤ 15 ft 11.25 inches) OR CCST level drops below 0.7 feet (AV ≥ 598 ft 1 inch), THEN;

(1) Verify open MO 1(2)-1301-25, TORUS PMP SUCT VLV.

(2) Verify open MO 1(2)-1301-26, TORUS PMP SUCT VLV.

(3) Verify close MO 1(2)-1301-22, CCST PUMP SUCT VLV.

(4) IF time permits, THEN perform RCIC fill and vent per QCOP 1300-01.

(5) Verify all Turbine trip alarms are clear.

(6) Depress TURB RESET.

b. IF Torus level reaches +5 inches (AV ≤ 15 ft 11.25 inches) AND CCST level drops below 0.7 feet (AV ≥ 598 ft 1 inch), THEN;

(1) Close MO 1(2)-1301-26, TORUS PMP SUCT VLV.

(2) Close MO 1(2)-1301-25, TORUS PMP SUCT VLV.

(3) Open MO 1(2)-1301-22, CCST PUMP SUCT VLV.

(4) Verify all Turbine trip alarms are clear.

(5) Depress TURB RESET.

7. IF trip was due to a RCIC Turbine exhaust discharge high pressure, THEN:

a. IF high Torus pressure exist as indicated on 1(2)-1602-1 TORUS PRESS, THEN refer to applicable QGA procedure.

b. WHEN RCIC high exhaust pressure trip signal is clear, THEN depress TURB RESET.

8. IF RCIC Turbine trip was due to a RCIC isolation, THEN:

a. IF equal to or less than 54 psig Reactor pressure as indicated on 1(2)-640-25A/B, 1(2)-A/B RX PRESS, THEN NO action is required as this is an expected isolation of RCIC System.

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[ ]

CAUTION

Radiological procedures should be followed for entry into the RCIC Room due to the possibility of a steam line break.

[ ]

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b. IF high steam flow as indicated by alarm A-15, RCIC STEAMLINE HIGH DP on Panel 901(2)-4, THEN direct an Operator to check room status (room temperature and steamline breaks, etc.) prior to unisolating RCIC System.

c. IF high area temperature as indicated by alarm H-2, AREA HI TEMP STEAM LEAK DETECTION, on Panel 901(2)-3 AND confirmed by one of the alarms on 901(2)-21, THEN direct an Operator to check room status (cooler operating, room temperature, etc.) prior to unisolating RCIC System.

d. WHEN it has been determined that RCIC System is to be unisolated, THEN:

(1) Verify all RCIC isolation and Turbine trip signal(s) are cleared.

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[ ]

CAUTION

IF RCIC automatic initiation is present, THEN, when RCIC isolation is reset, RCIC will auto-restart. Water hammer may occur.

[ ]

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(2) Depress STM LINE BRK TRIP RESET.

(3) Depress TURB RESET.

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[ ]

NOTE

Reactor pressure must be greater than 54 psig to open STM SPLY ISOL VLVs.

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(4) Open MO 1300-17, STM SPLY ISOL VLV.

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CAUTION

Care must be exercised in next step so as to prevent spurious RCIC isolation due to high steam flow and to prevent water hammer.

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(5) IF time permits, THEN slowly warm-up RCIC steam lines by:

(a) Slowly crack open MO 1(2)-1301-16, STM SPLY ISOL VLV, and perform the following:

(b) Monitor PI 1(2)-1340-6,TURB INLET PRESS, for a slow increase in pressure.

(c) IF Annunciator 901(2)-4 F-16, RCIC TURBINE INLET STM DRN HIGH LEVEL, is lit, THEN do NOT open valve further.

(d) WHEN RCIC steam line pressure is equal to Reactor pressure AND Annunciator 901(2)-4 F-16, RCIC TURBINE INLET STM DRN HIGH LEVEL, cleared, THEN open fully MO 1(2)-1301-16.

(6) IF time does NOT permit for slow warm-up, THEN open MO 1(2)-1301-16, STM SPLY ISOL VLV.

9. WHEN RCIC Turbine trip and/or isolation has been reset AND RCIC is required for operation, THEN restart RCIC System per QCOP 1300-02.

10. IF RCIC is NOT required for operation, THEN place RCIC in the standby lineup per QCOP 1300-01.

11. Notify Shift Manager to classify event as a possible E-Plan condition and initiate E-Plan as necessary.

12. IF RCIC is inoperable, THEN perform QCAP 0230-19.

E. DISCUSSION

1. RCIC Turbine trips are:

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NOTE

Item E.1.a will close the TRIP THROTTLE VLV.

Item E.1.b - E.1.e will close MO 1(2)-1301-60, MIN FLOW VLV, and MO 1(2)-1301-61, STM TO TURB VLV.

IF RCIC trip was caused by Reactor high level, item E.1.b, THEN RCIC will auto restart on a low-low level initiation signal.

All other trips require operator actions for resetting the trips.

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a. Turbine overspeed; 5600 rpm. (Mechanical)

b. High Reactor Vessel water level:

(1) For Unit 1, $\leq$ 54.23 inches.

(2) For Unit 2, $\leq$ 50.34 inches.

c. Low pump suction pressure; 15 inches Hg vacuum.

d. High RCIC Turbine exhaust pressure; 25 psig.

e. Automatic RCIC Isolation.

2. RCIC isolation signals are: (F-2)

a. RCIC Turbine area high temperature; $\leq$ 169°F.

b. RCIC steam line high flow; 175% of rated steam flow with a time delay of $\geq$ 3.2 and $\leq$ 8.8 seconds.

c. Reactor Vessel low pressure; $\geq$ 54 psig.

F. REFERENCES

1. TS 3.3.5.2, Reactor Core Isolation Cooling (RCIC) Instrumentation.

2. TS 3.3.6.1, Primary Containment Isolation Instrumentation.

3. TS 3.5.3, RCIC System.

4. TS 3.6.1.3, Primary Containment Isolation Valves (PCIVs).

5. M-50 (M-89), Diagram of RCIC Piping.

6. 4E-1484A (4E-2484A), Schematic Diagram RCIC System Part 1.

7. 4E-1484B (4E-2484B), Schematic Diagram RCIC System Part 2.

8. 4E-1484C (4E-2484C), Schematic Diagram RCIC System Part 3.

9. 4E-1484D Sheets 1 and 2 (4E-2484D Sheets 1 and 2), Schematic Diagram RCIC System Part 4.

10. 4E-1484E Sheets 1 and 2 (4E-2484E Sheets 1 and 2), Schematic Diagram RCIC System Part 5.

11. 4E-1484F Sheets 1 and 2 (4E-2484F Sheets 1 and 2), Schematic Diagram RCIC System Part 6.

12. 4E-1484G (4E-2484G), Schematic Diagram RCIC System Part 7.

13. C00398, GEK 9546, Instruction Operation and Maintenance, System 1300 - Reactor Core Isolation Cooling.

14. C00471, GEK 27820A, Process Instrument Subsystem of the Reactor Core Isolation Cooling System.

15. QCOP 1300-01, RCIC Preparation for Standby Operation.

16. QCOP 1300-02, RCIC System Manual Startup (Injection/Pressure Control).

17. QCAP 0230-19, Equipment Operability.

18. UFSAR 5.4.6, Reactor Core Isolation Cooling System.

19. Information Notice 2001-01: Operational Issues Identified in Boiling Water Reactor Trip And Transient.

20. QCNPS Procedure Writer's Guide, Rev. 1, dated January 31, 1990.

# RCIC SYSTEM MANUAL STARTUP (INJECTION/PRESSURE CONTROL)

## A. PURPOSE

The purpose of this procedure is to provide the steps necessary to manually start up the Reactor Core Isolation Cooling (RCIC) System for injection to the Reactor Vessel. Also, steps are provided for Reactor pressure control.

## B. DISCUSSION

B.1. The attachments to this procedure can be prepared and used as Hard Cards in accordance with OP-AA-101-403.

## C. PREREQUISITES

C.1. RCIC in standby lineup per QCOP 1300-01. ____

## D. PRECAUTIONS

D.1. Injection of RCIC into Reactor during power operation could cause a reactivity transient.

D.2. System operation below 400 gpm should be minimized to prevent the possible cycling of the Turbine Exhaust check valve.

D.3. RCIC operation below 2200 rpm should be minimized because it may result in unstable system operation and equipment damage. (H.8.c)

D.4. RCIC operation with torus pressure elevated above 25 psig may cause a RCIC trip due to a high exhaust pressure signal. (H.8.c)

D.5. RCIC operation with torus temperature above 140°F should be avoided because it may result in equipment damage due to inadequate lube oil cooling. (H.8.c)

D.6. Oxygen concentrations in the Torus may increase during extended RCIC operation. **IF** extended RCIC operation is anticipated, **THEN monitor** the oxygen concentration **AND operate** the nitrogen inerting system as necessary.

D.7. Turb Vac Pump needs to run a minimum of 30 minutes after shutting down RCIC to ensure moisture is removed from the governor valve.

D.8. **Notify** Rad Protection that performance of this procedure has the potential of impacting radiological conditions in the plant. **Perform** the notification as soon as time permits so as **NOT** to preclude emergency actions.

D.9. **IF** RCIC initiation signal is present following any isolation signal, **THEN** RCIC will auto start when the isolation is cleared. Potential water hammer may occur.

## E. LIMITATIONS AND ACTIONS

E.1. **IF** RCIC becomes inoperable, **THEN perform** QCAP 0230-19.

E.2. **WHEN** RCIC suction is from CCST, **THEN minimize** the time that MO 1(2)-1301-60, MIN FLOW VLV, is open to prevent draining CCST to the Torus.

E.3. **IF** MO 1(2)-1301-25, TORUS PMP SUCT VLV, **OR** MO 1(2)-1301-26, TORUS PMP SUCT VLV, is open, **THEN** MO 1(2)-1301-53, CCST TEST BYP, will automatically close to prevent pumping Torus water to the CCST.

E.4. RCIC automatic initiation is Reactor Vessel Water Level-Low Low; for Unit 1 -56.78 inches and for Unit 2 -55.2 inches. (H.1.a.)

E.5. RCIC isolation signals are as follows: (H.1.b.)

a. RCIC Turbine Area Temperature-High; $\leq$ 169°F.

b. RCIC Steam Line Flow-High; $\leq$ 175% of rated steam flow with a time delay of $\geq$ 3.2 seconds and $\leq$ 8.8 seconds.

c. RCIC Steam Supply Line Pressure-Low; $\geq$ 54 psig.

E.6. RCIC automatic turbine trips are:

**NOTE**

Item E.6.a will close the TRIP THROTTLE VLV.

Item E.6.b - E.6.e will close MO 1(2)-1301-60, MIN FLOW VLV, and MO 1(2)-1301-61, STM TO TURB VLV.

The high Reactor level trip signal, item E.6.b., will auto reset.

a. Turbine overspeed; 5600 rpm. (Mechanical)

b. Reactor Vessel Water Level-High; for Unit 1 $\leq$ 54.23 inches and for Unit 2 $\leq$ 50.34 inches.

c. Low pump suction pressure; 15 inches Hg vacuum.

d. High RCIC Turbine exhaust pressure; 25 psig.

e. Automatic RCIC Isolation.

E.7. Motor Operated Valves Guidelines: (H.8.b)

a. A maximum of five starts within a one-minute period, followed by a 30-minute cooling off time.

b. The valve is fully operational during the cooling off period.

c. When throttle valves are required to adjust flow or pressure, it may be necessary to wait a few seconds to abide by this guideline.

E.8. **IF** Torus temperature is increasing, **THEN** prior to reaching 95°F, RHR Torus Cooling Mode should be placed into service. (H.1.f.)

E.9. **IF** Torus level reaches + 5 inches **OR** CCST level drops below 0.7 feet (10,000 gal.), **THEN** RCIC System suction auto transfers from CCST to Torus Suction.

E.10. **IF** required to start RCIC immediately to inject into the RPV, **THEN** the operator aid posted on the Control Room panels, modeled after Attachment A, may be used to direct those immediate actions followed by review of this procedure when time is available.

## F. PROCEDURE

F.1. **IF** at any time during the performance of this procedure it is desired to switch suction from CCST to Torus, **THEN**:

**NOTE**

**WHEN** 1(2)-1301-25 and 26 are fully OPEN, **THEN** 1(2)-1302-22 will AUTOMATICALLY close.

a. **Open** MO 1(2)-1301-25, TORUS PMP SUCT VLV. ____

b. **Open** MO 1(2)-1301-26, TORUS PMP SUCT VLV. ____

c. **Verify closed** MO 1(2)-1301-22, CCST PUMP SUCT VLV. ____

d. **Verify** MO 1(2)-1301-53, CCST TEST BYP, closes automatically if open. ____

F.2. **IF** at any time during the performance of this procedure it is desired to switch suction from Torus to CCST, **THEN**:

a. **Shut down** RCIC per QCOP 1300-05. ____

b. **Close** MO 1(2)-1301-25, TORUS PMP SUCT VLV. ____

c. **Close** MO 1(2)-1301-26, TORUS PMP SUCT VLV. ____

d. **Open** MO 1(2)-1301-22, CCST PUMP SUCT VLV. ____

F.3. **IF** at any time during the performance of this procedure while in a station blackout event the loss of battery power is imminent or has occurred, **THEN exit** this procedure and **perform** QCOP 1300-09, RCIC Local Manual Operation. ____

F.4. **IF** starting RCIC for Reactor injection using the initiation pushbutton **THEN**:

a. **Depress** and **hold** RCIC MAN INITIATION Pushbutton for at least 30 sec. ____

b. **Verify** TURB VACU PMP auto starts. ____

F.4. (cont'd)

c. **Verify open** MO 1(2)-1301-61, STM TO TURB VLV. ____

d. **Verify** RCIC Turbine speed increasing. ____

e. **Verify open** MO 1(2)-1301-60, MIN FLOW VLV. ____

f. **Verify closed** AO 1(2)-1301-34 and 35, STM LINE DRAIN ISO VLVS. ____

g. **Verify open** MO 1(2)-1301-62, TURB CLG WTR VLV. ____

h. **Verify open** MO 1(2)-1301-48, PMP DISCH VLV. ____

i. **Verify open** MO 1(2)-1301-49, PMP DISCH VLV. ____

j. **Verify** RCIC Pump discharge flow increases to 400 gpm as indicated on FIC 1(2)-1340-1, RCIC FLOW CONTROLLER. ____

k. **Verify closed** MO 1(2)-1301-60, MIN FLOW VLV. ____

l. **Monitor** Reactor water level. ____

m. **IF** RCIC discharge flow adjustment is required, **THEN adjust** flow with FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, using one of the following methods:

(1) **Verify** FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, in AUTO and **adjust** setpoint. ____

(2) **Place** FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, to manual and **adjust** manual adjustment lever. ____

n. **Monitor** RCIC Turbine for proper operation:

(1) Turbine Speed 2250 to 4500 rpm as indicated on SI 1(2)-1340-501, TURB SPEED. ____

(2) Discharge pressure greater than Reactor pressure as indicated on PI 1(2)-1340-7, PMP DISCH PRESS. ____

(3) RCIC Pump suction pressure 0 to 30 psig as indicated on PI 1(2)-1340-2, PMP SUCT PRESS. ____

F.4.n. (cont'd)

(4) RCIC exhaust pressure 1 to 20 psig as indicated on PI 1(2)-1340-3, TURB EXH PRESS. ____

F.5. **IF** manually starting RCIC for Reactor injection, **THEN**:

a. **Start** TURB VACU PMP. ____

b. **Open** MO 1(2)-1301-62, TURB CLG WTR VLV. ____

c. **Verify open** MO 1(2)-1301-48, PMP DISCH VLV. ____

d. **Open** MO 1(2)-1301-49, PMP DISCH VLV. ____

e. **Open** MO 1(2)-1301-60, MIN FLOW VLV. ____

f. **Open** MO 1(2)-1301-61, STM TO TURB VLV. ____

g. **Verify** RCIC Pump discharge flow increases to 400 gpm as indicated on FIC 1(2)-1340-1, RCIC FLOW CONTROLLER. ____

h. **Verify closed** MO 1(2)-1301-60, MIN FLOW VLV. ____

i. **IF** RCIC discharge flow adjustment is required **THEN adjust** flow with FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, using one of the following methods:

(1) **Verify** FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, in AUTO and **adjust** setpoint. ____

(2) **Place** FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, in manual and **adjust** manual adjustment lever. ____

j. **Monitor** RCIC Turbine for proper operation:

(1) Turbine Speed 2250 to 4500 rpm as indicated on SI 1(2)-1340-501 TURB SPEED. ____

(2) Discharge pressure greater than Reactor pressure as indicated on PI 1(2)-1340-7, PMP DISCH PRESS. ____

(3) RCIC Pump suction pressure 0 to 30 psig as indicated on PI 1(2)-1340-2, RCIC PMP SUCT PRESS. ____

F.5.j. (cont'd)

(4) RCIC exhaust pressure 1 to 20 psig as indicated on PI 1(2)-1340-3, TURB EXH PRESS. ____

F.6. **IF** manually starting RCIC for Reactor pressure control WITHOUT an ECCS signal present **THEN**:

a. **Open** MO 1(2)-2301-15, (HPCI) TEST RETURN VLV. ____

b. **Throttle open** MO 1(2)-1301-53, CCST TEST BYP. ____

c. **Start** TURB VACU PMP. ____

d. **Open** MO 1(2)-1301-62, TURB CLG WTR VLV. ____

e. **Verify closed** MO 1(2)-1301-49, PMP DISCH VLV. ____

f. **Open** MO 1(2)-1301-60, MIN FLOW VLV. ____

g. **Open** MO 1(2)-1301-61, STM TO TURB VLV. ____

h. **Verify** RCIC Pump discharge flow increases to 400 gpm or desired as indicated on FIC 1(2)-1340-1, RCIC FLOW CONTROLLER. ____

i. **Verify closed** MO 1(2)-1301-60, MIN FLOW VLV. ____

j. **IF** RCIC discharge flow or pressure adjustment is required, **THEN**:

(1) **Adjust** flow with FIC 1(2)-1340-1 RCIC FLOW CONTROLLER, using one of the following methods:

(a) **Verify** FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, in AUTO and **adjust** setpoint. ____

(b) **Place** FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, to manual and **adjust** manual adjustment lever. ____

(2) **Throttle** MO 1(2)-1301-53, CCST TEST BYP, until at least 100 psig above Reactor pressure. ____

F.6. (cont'd)

k. **Monitor** RCIC Turbine for proper operation:

(1) Turbine Speed 2250 to 4500 rpm as indicated on SI 1(2)-1340-501, TURB SPEED. ____

(2) Discharge pressure less than or equal to 1250 psig as indicated on PI 1(2)-1340-7, PMP DISCH PRESS. ____

(3) RCIC Pump suction pressure 0 to 30 psig as indicated on PI 1(2)-1340-2, PMP SUCT PRESS. ____

(4) RCIC exhaust pressure 1 to 20 psig as indicated on PI 1(2)-1340-3, TURB EXH PRESS. ____

F.7. **IF** manually starting RCIC for Reactor pressure control WITH Drywell pressure $\geq$ 2.43 psig, **THEN**:

a. **Place** FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, in MAN. ____

b. **Reduce** FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, to minimum by using the manual adjustment lever. ____

c. **Start** TURB VACU PMP. ____

d. **Open** MO 1(2)-1301-62, TURB CLG WTR VLV. ____

## NOTE

**WHEN** RCIC is operating with MO 1(2)-1301-60, MIN FLOW VLV, open, **THEN** FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, will indicate downscale.

e. **Open** MO 1(2)-1301-60, MIN FLOW VLV. ____

f. **Open** MO 1(2)-1301-61, STM TO TURB VLV. ____

g. **IF** RCIC discharge pressure adjustment is required, **THEN adjust** pressure with FIC 1(2)-1340-1, RCIC FLOW CONTROLLER, using the manual adjustment lever. ____

F.7. (cont'd)

h. **Monitor** RCIC for proper operation.

(1) Turbine Speed 2250 to 4500 rpm as indicated on SI 1(2)-1340-501, TURB SPEED. ____

(2) Discharge pressure less than or equal to 1250 psig as indicated on PI 1(2)-1340-7, PMP DISCH PRESS. ____

(3) RCIC Pump suction pressure 0 to 30 psig as indicated on PI 1(2)-1340-2, PMP SUCT PRESS. ____

(4) RCIC exhaust pressure 1 to 20 psig as indicated on PI 1(2)-1340-3, TURB EXH PRESS. ____

F.8. **When** RCIC System shutdown is desired, **THEN perform** QCOP 1300-05. ____

## G. ATTACHMENTS

G.1. Attachment A RCIC Manual Startup.

## H. REFERENCES

### H.1. Technical Specifications:

a. TS 3.3.5.2, Reactor Core Isolation Cooling (RCIC) System Instrumentation.

b. TS 3.3.6.1, Primary Containment Isolation Instrumentation.

c. TS 3.5.3, RCIC System.

d. TS 3.6.1.1, Primary Containment.

e. TS 3.6.1.3, Primary Containment Isolation Valves (PCIVs).

f. TS 3.6.2.1, Suppression Pool Average Temperature.

g. TS 3.6.2.2, Suppression Pool Water Level.

### H.2. P&IDs:

a. M-50 (M-89), Diagram of RCIC Piping.

## H.3. Drawings:

a. 4E-1484A (4E-2484A), Schematic Diagram RCIC System Part 1.

b. 4E-1484B (4E-2484B), Schematic Diagram RCIC System Part 2.

c. 4E-1484C (4E-2484C), Schematic Diagram RCIC System Part 3.

d. 4E-1484D sheet 1 and 2 (4E-2484D sheet 1 and 2), Schematic Diagram RCIC System Part 4.

e. 4E-1484E sheet 1 and 2 (4E-2484E sheet 1 and 2), Schematic Diagram RCIC System Part 5.

f. 4E-1484F sheet 1 and 2 (4E-2484F sheet 1 and 2), Schematic Diagram RCIC System Part 6.

g. 4E-1484G (4E-2484G), Schematic Diagram RCIC System Part 7.

## H.4. Manuals:

a. C0398 (GEK 9546), Instruction Operation and Maintenance, System 1300 Reactor Core Isolation Cooling.

b. C0471 (GEK 27820A), Process Instrument Subsystem of the Reactor Core Isolation Cooling System.

## H.5. Procedures:

a. QCOP 1000-09, Torus Cooling Start-Up and Operation.

b. QCOP 1300-01, RCIC System Preparation for Standby Operation.

c. QCOP 1300-05, RCIC System Shutdown.

d. QCAP 0230-19, Equipment Operability.

## H.6. UFSAR:

a. UFSAR Section 5.4.6, RCIC System.

## H.7. Commitments:

None.

H.8. **Others:**

a. BWR Owner's Group Emergency Procedure and Severe Accident Guidelines.

b. Eenigenburg Letter to R. Bax dated 10-28-85, Operational Guidelines for Motor Operated Valves.

c. DBD-QC-001.

d. QCPWG (Procedure Writers Guide) Vol 3.

**ATTACHMENT A (Page 1 of 1)**

# RCIC MANUAL STARTUP

## MANUAL PUSHBUTTON INITIATION

1. Depress and hold RCIC MAN INITIATION pushbutton for at least 30 sec.

## MANUAL STARTUP - LEVEL CONTROL

1. **Start** TURB VACU PMP.
2. **Open** MO 1(2)-1301-62, TURB CLG WTR VLV.
3. **Verify open** MO 1(2)-1301-48, PMP DISCH VLV.
4. **Open** MO 1(2)-1301-49, PMP DISCH VLV.
5. **Open** MO 1(2)-1301-60, MIN FLOW VLV.
6. **Open** MO 1(2)-1301-61, STM TO TURB VLV.
7. **Adjust** flow in the MANUAL or AUTO mode.

**Refer** to QCOP 1300-02

Exelon SM
Nuclear

# Nuclear Generation Group

# Job Performance Measure

Supply Bus 14-1 from Bus 24-1 using the Hardcard

JPM Number: B.1.c.

Revision Number: 1

Date: 9/2002

| | | |
|---|---|---|
| **Developed By:** | Gary Thomas | 10/10/02 |
| | **Instructor** | **Date** |
| **Validated By:** | RC Mumford | 10-11-02 |
| | **SME or Instructor** | **Date** |
| **Review By:** | M Sweezle | 10-11-02 |
| | **Operations Representative** | **Date** |

Need change to Hardcard Rev.

# Job Performance Measure (JPM)

## Revision Record (Summary)

Revision 0, This JPM is developed IAW guidelines established in NUREG 1021 Rev 8 ES-301 and Appendix C. This JPM meets the criteria of Category B.1 "Control Room Systems," for RO/SRO candidates.

Revision 1 The JPM was revised to incorporate validation time and comments.

**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section at the bottom of the page. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

# Job Performance Measure (JPM)

## SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC 94 (rst 94).

2. **IC Description:**

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

3. **Manual Actuation:**

- Place the 1B Core Spray pump in PTL on 901-3 panel.
- Place the 1C RHR pump in PTL on 901-3 panel.
- Place the 1D RHR pump in PTL on 901-3 panel.
- Place the U-1 EDG control switch in STOP on the 901-8 panel.

4. **Malfunctions:**

- Prevent the U-1 EDG from starting (***imf dg03a***)
- Trip the bus 14 to 14-1 tie breaker 152-1427 (***imf ed04m***)
- Acknowledge alarms associated with the bus 14 to bus 14-1 breaker trip as part of setup.

5. **Remotes:** When asked by the candidate for U-2 to close bus 24-1 to 14-1 crosstie breaker on U-2, use remote function ***(mrf ed34r close)*** to close in the breaker and report to candidate that the bus 24-1 to 14-1 crosstie breaker on U-2 is closed in.

6. **Overrides:** NONE

7. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

8. This completes the setup for this JPM.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

- Unit 1 has experienced a transient resulting in a LOCA and drywell pressure of 5 psig.
- The bus 14 to bus 14-1 tie breaker has tripped.
- The Unit 1 Emergency Diesel Generator failed to start.
- Bus 14-1 is de-energized.
- No overcurrent alarms are up for any busses.
- Unit 2 is operating at 150 MWE in a split configuration (load is split between the UAT and the RAT).
- Unit 2 Emergency Diesel Generator to bus 24-1 breaker is open.
- The 1B Core Spray pump and the 1C and 1D RHR pumps are in PTL and have been verified.
- The Unit Supervisor has authorized hardcards.
- This JPM is not time critical

INITIATING CUE

Energize bus 14-1 from bus 24-1 using the hardcard.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

# Job Performance Measure (JPM)

JPM Start Time: 1342

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| | Obtain hardcard for BUS 14-1 TO BUS 24-1 TIE OPERATION (BUS 14-1 DEAD) from the 901-74 panel. | Obtains hardcard for BUS 14-1 TO BUS 24-1 TIE OPERATION (BUS 14-1 DEAD) from the 901-74 panel. | [ ] [ ] [ ] |
| Hardcard step 1 | Places control switches in pull to lock to isolate bus 14. | Places the following control switches in PTL.<br>* Bus 14-1 & Bus 61 Tie breaker<br>* U1 Diesel Gen toBus 14-1 ACB<br>* Busses 14 and 14-1 Tie Breaker | [ ] [ ] [ ] |
| *Hardcard step 2 | Directs the Unit 2 NSO or ANSO to operate the synchronization switch and close bus 24-1 & 14-1 tie breaker. | Directs the Unit 2 RO to perform the following two steps on the 902-8 panel:<br>1. Place SYNCH switch to ON for BUS 24-1 & 14-1 tie ACB.<br>2. Close BUS 24-1 & 14-1 tie ACB | [ ] [ ] [ ] |
| ***Evaluators Note: If candidate asks the evaluator to perform this task, direct them to use the phone to contact the U-2 RO (simulator operator) for performance of these two tasks.***<br>***Simulator Operator Note: When asked by the candidate for U-2 to close bus 24-1 to 14-1 crosstie breaker on U-2, use remote function (mrf ed34r close) to close in the breaker and report to candidate that the bus 24-1 to 14-1 crosstie breaker on U-2 is closed in.*** | | | |
| *Hardcard step 3.a. | Places the synchronization switch ON for the crosstie. | Places the synchronization switch on the 901-8 panel to ON for BUS 24-1 & 14-1 tie ACB. | [ ] [ ] [ ] |
| *Hardcard step 3.b. | Close bus 14-1 & 24-1 tie breaker. | Closes and holds (for approximately 10 seconds) the BUS 24-1 & 14-1 tie ACB on the 901-8 panel. Verifies BUS 24-1 & 14-1 tie ACB closed indication light and bus 14-1 live light lit. | [ ] [ ] [ ] |
| ***EVALUATOR: The candidate should inform you that the task is complete.*** | | | |

JPM Stop Time: 1346

# Job Performance Measure (JPM)

Operator's Name: _____

Job Title: RO ❑ SRO ❑

JPM Title: Supply Bus 14-1 from Bus 24-1 using the Hardcard

JPM Number: B.1.c. Revision Number: 1

Task Number and Title:

SR-6500-P04. Given a loss of normal power to an emergency bus (13-1/14-1) with a failure of the associated emergency diesel to start, supply power to the emergency bus using the crosstie from unit 2 and restore 480 VAC busses in accordance with QOA 6500-03, QCOP 6500-08, QOA 6700-04 and QOA 6700-01. (SOER 83-6 r4)

K/A Number and Importance:

**K/A**: 262001 A4.01 **Rating:** 3.4/3.7

**Suggested Testing Environment:** Simulator

**Actual Testing Environment:** ❑ Simulator ❑ Plant ❑ Control Room

**Testing Method:** ❑ Simulate ❑ Perform **Faulted:** ❑ Yes ■ No **Alternate Path:** ❑ Yes ■ No

**Time Critical:** ❑ Yes ■ No

**Estimated Time to Complete:** 7 minutes **Actual Time Used:** 4 minutes

**References:** QCOP 6500-08, Rev. 13

# Job Performance Measure (JPM)

**EVALUATION SUMMARY:**

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: Supplied Hard Card needs new revision

Evaluator's Name: _____ (Print)

Evaluator's Signature: _____ Date: _____





NRC Copy #1

ATTACHMENT C (Page 1 of 1)

# BUS 14-1 TO BUS 24-1 TIE BREAKER OPERATION (BUS 14-1 DEAD)

## BUS 24-1 POWERED and BUS 14-1 DEAD

1. **Place** the following control switches in PTL:

| | |
|---|---|
| BUS 14-1 & BUS 61 TIE BKR | 1B CS PMP |
| U1 DIESEL GEN TO BUS 14-1 ACB | 1C RHR PMP |
| BUSSES 14 AND 14-1 TIE BKR | 1D RHR PMP |

2. On Panel 902-8:

   a. **Place** SYNCH switch to ON for BUS 24-1 & 14-1 TIE ACB.

   b. **Close** BUS 24-1 & 14-1 TIE ACB.

3. On Panel 901-8:

   a. **Place** SYNCH switch to ON for BUS 14-1 & 24-1 TIE ACB.

   b. **Close** (AND hold for 10 seconds) BUS 14-1 & 24-1 TIE ACB.

**Refer** to QCOP 6500-08

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

(Student Copy)

- Unit 1 has experienced a transient resulting in a LOCA and drywell pressure of 5 psig.
- The bus 14 to bus 14-1 tie breaker has tripped.
- The Unit 1 Emergency Diesel Generator failed to start.
- Bus 14-1 is de-energized.
- No overcurrent alarms are up for any busses.
- Unit 2 is operating at 150 MWE in a split configuration (load is split between the UAT and the RAT).
- Unit 2 Emergency Diesel Generator to bus 24-1 breaker is open.
- The 1B Core Spray pump and the 1C and 1D RHR pumps are in PTL.
- The Unit Supervisor has authorized hardcards.
- This JPM is not time critical

INITIATING CUE

Energize bus 14-1 from bus 24-1 using the hardcard.

Exelon
Nuclear

# Nuclear Generation Group

# Job Performance Measure

Perform a Manual Scram Functional Test with Rod Drifts

JPM Number: B.1.d.

Revision Number: 1

Date: 9/2002

| | | |
|---|---|---|
| **Developed By:** | Gary Thomas<br>**Instructor** | 10/10/02<br>**Date** |
| **Validated By:** | [signature]<br>**SME or Instructor** | 10-11-02<br>**Date** |
| **Review By:** | M Swigle<br>**Operations Representative** | 10-11-02<br>**Date** |

# Job Performance Measure (JPM)

## Revision Record (Summary)

Revision 0, This JPM is developed IAW guidelines established in NUREG 1021 Rev 8 ES-301 and Appendix C. This JPM meets the criteria of Category B.1 "Control Room Systems," for RO/SRO candidates.

Revision 1 The JPM was revised to incorporate validation time and comments.

**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section at the bottom of the page. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

# Job Performance Measure (JPM)

## SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC _21_ (rst 21).

NOTE: This JPM will result in a manual scram being inserted by the candidate. If this will effect other JPMS, it should be used alone or with administrative JPMS that do not require the use of the simulator or process computer.

2. ***Provide a copy of QCOS 0500-02 with section D.1. filled out for "Unit 1" as a "Normal Surveillance", signed and dated by the Unit Supervisor, and section D.2. initialed as EO/ANSO.***

3. **Manual Actuation**:

   NONE

   **Malfunctions**:

   Assign B RPS tripped to trigger 2 "***trg 2 E2***"

   Assign rod 1815 to drift in when RPS B is tripped "***imf rd03r1815(2)***"

   Assign rod 2227 to drift in when RPS B is tripped "***imf rd03r2227(2)***"

   Assign rod 1839 to drift in when RPS B is tripped "***imf rd03r1839(2)***"

   Assign rod 0627 to drift in when RPS B is tripped "***imf rd03r0627(2)***"

   **Remotes**:

   NONE

   **Overrides**:

   NONE

4. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

5. This completes the setup for this JPM.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

- The Unit Supervisor has ordered that a manual scram functional test be performed this shift on Unit 1.
- This JPM is not time critical.

INITIATING CUE

Perform a U-1 Manual Scram Functional Test IAW QCOS 0500-02.

***Provide a copy of QCOS 0500-02 with section D.1. filled out for "Unit 1" as a "Normal Surveillance", signed and dated by the Unit Supervisor, and section D.2. initialed as EO/ANSO.***

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

# Job Performance Measure (JPM)

JPM Start Time: _____

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT | UNSAT | N/A |
|---|---|---|---|---|---|
| *H.1.a. | Depress the "Channel A" manual scram pushbutton. | Depress lefthand pushbutton. | [ ] | [ ] | |
| H.1.b. | Verify red light in "Channel A" manual scram pushbutton is lit. | Red light lit. | [ ] | [ ] | [ ] |
| H.1.c. | Verify "Channel A" scram solenoid group lights out. | Four RPS A scram solenoid lights not lit. | [ ] | [ ] | [ ] |
| H.1.d. | Verify "Channel A Manual Scram" alarm. | Annunciator 901-5 A-10 lit. | [ ] | [ ] | [ ] |
| *H.1.e. | Reset half scram and verify all 4 lights lit for Channel A and B. | Positions RPS scram reset switch first to position 2 and 3 then to position 1 and 4.<br>- Verifies all 4 lights lit for Channel A and B. | [ ] | [ ] | |
| H.1.f. | Reset "Channel A Manual Trip" alarm. | Depresses reset pushbutton AND verifies Annunciator 901-5 A-10 not lit. | [ ] | [ ] | |
| *H.2.a. | Depress the "Channel B" manual scram pushbutton. | Depresses righthand pushbutton. | [ ] | [ ] | |
| H.2.b. | Verify red light in "Channel B" manual scram pushbutton is lit. | Red light lit. | [ ] | [ ] | [ ] |
| H.2.c. | Verify "Channel B" scram solenoid GP lights out. | Four RPS B scram solenoid lights not lit. | [ ] | [ ] | [ ] |
| H.2.d. | Verify "Channel B Manual Scram" alarm. | Annunciator 9015 A-15 lit. | [ ] | [ ] | [ ] |
| *F.5. | Recognizes rod drifts requiring a reactor scram per section F.5. | Recognizes that 4 rods are drifting into the core, and inserts a manual reactor scram. | [ ] | [ ] | |
| ***Cue: Inform candidate that JPM is over when reactor is scrammed.*** | | | | | |

JPM Stop Time:_____

# Job Performance Measure (JPM)

Operator's Name: _____

Job Title: RO ❑ SRO ❑

JPM Title: Perform a Manual Scram Functional Test with Rod Drifts

JPM Number: B.1.d. Revision Number: 1

Task Number and Title:

**SR-0500-P01** - Given an operating reactor plant, perform the manual scram functional test in accordance with QCOS 500-2.

K/A Number and Importance:

**K/A:** 212000 A4.01 **RATING:** 4.6/4.6

**Suggested Testing Environment:** Simulator

**Actual Testing Environment:** ❑ Simulator ❑ Plant ❑ Control Room

**Testing Method:** ❑ Simulate ❑ Perform **Faulted:** ❑ Yes ■ No **Alternate Path:** ■ Yes ❑ No

**Time Critical:** ❑ Yes ■ No

**Estimated Time to Complete:** 9 minutes **Actual Time Used:** _____ minutes

**References:** QCOS 0500-02, Rev. 12

# Job Performance Measure (JPM)

**EVALUATION SUMMARY:**
Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments:_____

_____

_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ Date: _____

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

(Student Copy)

- The Unit Supervisor has ordered that a manual scram functional test be performed this shift on Unit 1.
- This JPM is not time critical.

INITIATING CUE

Perform a U-1 Manual Scram Functional Test IAW QCOS 0500-02.

Candidate Copy

QCOS 0500-02
UNIT 1(2)
REVISION 12
**Continuous Use**

# MANUAL SCRAM INSTRUMENTATION FUNCTIONAL TEST

## A. PURPOSE

This procedure satisfies the Technical Specifications functional test requirements of Manual Scram Instrumentation. This test also satisfies a portion of the Logic System Functional Test overlap as required by Technical Specification 3.3.1.1. (J.1.a.)

## B. DISCUSSION

None.

## C. EQUIPMENT REQUIRED

None.

## D. PREREQUISITES

D.1. The Unit Supervisor has completed the following:

a. Unit 1(2)

b. Reason for test (check appropriate item):

| | |
|---|---|
| Normal Surveillance | ( ✓ ) |
| Post Maintenance | ( ) |
| IST Alert Range | ( ) |
| Partial for _____ | ( ) |
| Other _____ | ( ) |

c. Permission to start test:

M Smith
US Signature

9-17-02 / 0915
Date / Time

D.2. HCU scram pilot solenoid fuses at 2201(2)-22A panels **NOT** blown. SB/MS

## E. PRECAUTIONS

None.

## F. LIMITATIONS AND ACTIONS

F.1. At the completion of the surveillance the US must immediately review the results of this test for compliance to Technical Specifications requirements.

F.2. **IF** a Control Rod inadvertently scrams, **THEN refer** to QCOA 0300-04 and QCOA 0300-11.

F.3. **IF** the logic fails to operate properly, **THEN notify** Unit Supervisor.

F.4. **IF** two **OR** more control rods start to drift, **AND** all RPS scram solenoid lights lit, **THEN scram** the Reactor.

F.5. **IF** four **OR** more control rods start to drift, **THEN scram** the Reactor.

F.6. **IF** partial testing is required, **THEN** the Unit Supervisor will **document** in the PREREQUISITES, **EITHER** the steps to be performed **OR** the steps to be disregarded, **AND** any special instructions required for the performance of the partial test.

## G. PERFORMANCE ACCEPTANCE CRITERIA

G.1. **WHEN** RX SCRAM CH A **OR** RX SCRAM CH B manual scram pushbutton is depressed, **THEN** the following actions occur:

a. ALL four respective RPS SCRAM SOLENOID GROUP indicating lights for that RPS channel are **out**. (J.1.a)

b. Annunciator 901(2)-5 A-10 **OR** A-15, CHANNEL A or B MANUAL SCRAM alarms.

## H. PROCEDURE

H.1. **Verify** proper operation of RPS Channel A manual scram instrumentation:

a. **Depress** RX SCRAM CH A manual scram pushbutton.

b. **Verify** red light on RX SCRAM CH A manual scram pushbutton is LIT.

H.1. (cont'd)

c. **Verify** all <u>four</u> RPS Channel A SCRAM SOLENOID GROUP indicating lights are **out**. (G.1.a.)

d. **Verify** 901(2)-5 A-10, CHANNEL A MANUAL SCRAM **alarms**. (G.1.b.)

e. **Reset** Half-Scram:

(1) **Place** SCRAM RESET switch to reset position GR 2 and 3.

(2) **Place** SCRAM RESET switch to reset position GR 1 and 4.

(3) **Verify** SCRAM SOLENOID GROUP CHANNEL A indicating lights **lit**.

(4) **Verify** SCRAM SOLENOID GROUP CHANNEL B indicating lights **lit**.

f. **Reset** alarm 901(2)-5 A-10.

H.2. **Verify** proper operation of RPS Channel B manual scram instrumentation:

a. **Depress** RX SCRAM CH B manual scram pushbutton.

b. **Verify** <u>red</u> light on RX SCRAM CH B manual scram pushbutton is LIT.

c. **Verify** all <u>four</u> RPS Channel B SCRAM SOLENOID GROUP indicating lights are **out**. (G.1.a.)

d. **Verify** 901(2)-5 A-15, CHANNEL B MANUAL SCRAM **alarms**. (G.1.b.)

e. **Reset** Half-Scram:

(1) **Place** SCRAM RESET switch to reset position GR 2 and 3.

(2) **Place** SCRAM RESET switch to reset position GR 1 and 4.

H.2.e. (cont'd)

(3) **Verify** SCRAM SOLENOID GROUP CHANNEL A indicating lights **lit**. ____

(4) **Verify** SCRAM SOLENOID GROUP CHANNEL B indicating lights **lit**. ____

f. **Reset** alarm 901(2)-5 A-15. ____

H.3. **IF** this surveillance was satisfactory, **THEN**:

a. Surveillance performed by:

_____/_____
Signature Date

b. Satisfactory with discrepancies and corrective actions performed, as noted:

Yes ____ N/A ____

Comments: _____

c. Surveillance approved by:

_____/_____
US Signature Date

H.4. **IF** this surveillance was unsatisfactory, **THEN**:

a. **Operator**

(1) Description of deficiencies/comments:

_____

_____

(2) Work Request initiated:

Yes ____ No ____

(3) Surveillance performed by:

_____/_____
Signature Date

H.4. (cont'd)

b. **Unit Supervisor**

(1) CR initiated:

Yes _____ No ____

(2) QCAP 0230-19 Outage Report initiated:

Yes _____ No ____

(3) Additional corrective action:

_____

_____

(4) Surveillance approved by:

_____/_____
Signature Date

## I. ATTACHMENTS

None.

## J. REFERENCES

### J.1. Technical Specifications:

a. Table 3.3.1.1-1, Reactor Protection System Instrumentation: Manual Scram.

### J.2. P&IDs:

None.

### J.3. Drawings:

a. 4E-1467 (4E-2467) Sheet 3, Schematic Diagram Reactor Protection System Scram Valve Sol's, Misc. Aux. Relays.

### J.4. Manuals:

None.

J.5. **Procedures:**

a. QCGP 2-3, Reactor Scram.

b. QCAP 0230-19, Equipment Operability.

c. QCOA 0300-04, Mispositioned Control Rod.

d. QCOA 0300-11, Control Rod Drift.

e. QCOP 0500-03, Resetting Scrams.

J.6. **UFSAR:**

a. UFSAR Section 7.2, Reactor Protection Trip System.

J.7. **Commitments:**

None.

J.8. **Other:**

a. QCPWG (Procedure Writers Guide) Vol 3.

Exelon SM
Nuclear

# Nuclear Generation Group

# Job Performance Measure

Perform The Core Spray Pump Operability Test For Core Spray Pump B With Failure Of Minimum Flow Valve

JPM Number: B.1.e.

Revision Number: 1

Date: 9/2002

| | | |
|---|---|---|
| **Developed By:** | Instructor | 10/10/02 Date |
| **Validated By:** | SME or Instructor | 10-11-02 Date |
| **Review By:** | M Swegle Operations Representative | 10-11-02 Date |

# Job Performance Measure (JPM)

## Revision Record (Summary)

Revision 0, This JPM is developed IAW guidelines established in NUREG 1021 Rev 8 ES-301 and Appendix C. This JPM meets the criteria of Category B.1 "Control Room Systems," for RO/SRO candidates.

Revision 1 The JPM was revised to incorporate validation time and comments.

**Information For Evaluator's Use:**

Provide a copy of QCOS 1400-04 Core Spray Pump Operability Test with section D.1 and D.2. filled out for Unit 1 for a Partial for Core Spray Subsystem B signed and dated by the Unit Supervisor.
Steps H.1.a. marked N/A.
H.1.b.(1),(2),(4)&(5) initialed of as EO/ANSO.
H.1.b.(3) recorded as 5 seconds, and H.1.b.(3)(a) initialed as ANSO.
H.2. marked N/A.
H.4.a. marked N/A.

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section at the bottom of the page. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

# Job Performance Measure (JPM)

## SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC 21 (rst 21).

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Provide a copy of QCOS 1400-04 Core Spray Pump Operability Test with section D.1 and D.2. filled out for Unit 1 for a Partial for Core Spray Subsystem B signed and dated by the Unit Supervisor.
   Steps H.1.a. marked N/A.
   H.1.b.(1),(2),(4)&(5) initialed of as EO/ANSO.
   H.1.b.(3) recorded as 5 seconds, and H.1.b.(3)(a) initialed as ANSO.
   H.2. marked N/A.
   H.4.a. marked N/A.

3. **Manual Actuation**:

   NONE

**Malfunctions**:

Fail the Core Spray Minimum Flow Valve to Auto Close using ***(imf cs06b)***

Override 1-1402-38B handswitch to neutral using ***(ior dihs1140238b norm)***

**Remotes**:

NONE

**Overrides**:

NONE

4. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

5. This completes the setup for this JPM.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

- The Core Spray System is in its normal standby lineup IAW QCOP 1400-01.
- The Core Spray Pump Operability Test is required to be performed this shift.
- An EO has vented the core spray piping, performed pre-start checks on the 1B Core Spray pump, and is standing by outside the 1B Core Spray pump room.
- All personnel are cleared out of the 1B Core Spray room as controlled by the EO.
- This JPM is not time critical.

INITIATING CUE
Perform the Core Spray Pump Operability Test for the "1B" Core Spray Pump IAW QCOS 1400-04.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.





NRC COPY #1

# Job Performance Measure (JPM)

JPM Start Time: _____

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| H.3.a. | Verify torus level < -2" narrow range, then alternate suction pressure limit ≥ 1 psig is met. | Checks torus level. Verifies to be ~~>~~ - 2" (alternate suction pressure limit not applicable). | [ ] [ ] |
| *H.3.b.(1). | Start 1B Core Spray pump. | Positions pump CS to start. Red light lit. | [ ] [ ] |
| ***CUE: If NLO is asked to report on pump operating status, report that the 1B Core Spray pump is operating satisfactorily.*** | | | |
| H.3.b.(2). | Verify MO 1-1402-38B opens. | Verifies MO 38B open light lit. | [ ] [ ] |
| *H.3.b.(3). | Open MO 1-1402-4B. | Positions 4B CS to fully open valve open light lit. | [ ] [ ] |
| *H.3.b.(4). | Verify MO 1-1402-38B closes. | Determines that the 38B did not close. | [ ] [ ] |
| H.3.b.(4). | Attempts to close the 1-1402-38B. | Positions the CS for the 38B to close. Identifies that the valve still didn't close. | [ ] [ ] [ ] |
| H.3.b.(4). | Report the Min. Flow valve did not close. | Informs US that 1-1402-38B did not close. | [ ] [ ] |
| ***CUE: Acknowledge report as US.*** what do you recommend? ***When candidate identifies need to shutdown the pump IAW step F.6, give cue as US to shutdown the pump IAW step H.3.c. of the procedure. If candidate informs US that QCAP 0230-19 needs to be initiated, acknowledge that you as US will perform the procedure.*** | | | |
| H.3.c.(1). | Close MO 1-1402-4B. | Positions CS to close. Close light lit. | [ ] [ ] |
| *H.3.c.(3). | Stop 1B Core Spray pump. | Positions pump CS to stop Green light lit. | [ ] [ ] |
| ***EVALUATOR: When the pump is OFF, inform the candidate that the JPM is complete.*** | | | |

JPM Stop Time:_____

# Job Performance Measure (JPM)

Operator's Name: _____

Job Title: RO ❑ SRO ❑

JPM Title: Perform the Core Spray Pump Operability Test For Core Spray Pump B With Failure Of Minimum Flow Valve

JPM Number: B.1.e. Revision Number: 1

Task Number and Title:

**SR-1400-P05** - Given a reactor plant with a core spray loop in a standby lineup, perform the Core Spray Pump Flow Rate Test and return the core spray loop to standby in accordance with QCOS 1400-01.

K/A Number and Importance:

**K/A:** 209001 A4.04 **RATING:** 2.9/2.9

**Suggested Testing Environment:** Simulator

**Actual Testing Environment:** ❑ Simulator ❑ Plant ❑ Control Room

**Testing Method:** ❑ Simulate ❑ Perform **Faulted:** ❑ Yes ■ No **Alternate Path:** ■ Yes ❑ No

**Time Critical:** ❑ Yes ■ No

**Estimated Time to Complete:** 15 minutes **Actual Time Used:** _____ minutes

**References:** QCOS 1400-04, Rev. 10

# Job Performance Measure (JPM)

**EVALUATION SUMMARY:**

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____ (Print)

Evaluator's Signature: _____ Date: _____

Candidate Copy



# CORE SPRAY PUMP OPERABILITY TEST

## A. PURPOSE

The purpose of this procedure is to provide the necessary steps to perform the pump operability test.

## B. DISCUSSION

B.1. A flow rate of 4500 gpm at a discharge pressure of 216 psig is the calculated equivalent of the flow rate 4700 gpm discharging against a Reactor pressure of 90 psig. The 200 gpm increase in flow rate is used to account for possible thermal sleeve leakage.

## C. EQUIPMENT REQUIRED

None.

## D. PREREQUISITES

D.1. The Unit Supervisor has completed the following:

a. UNIT 1(2)

b. Reason for test (check appropriate item):

| | |
|---|---|
| Normal Surveillance | ( ✓ ) |
| Post Maintenance | ( ) |
| Partial for 1B subsystem Steps H.3 H.4.b. | ( ✓ ) |
| Other _____ | ( ) |

c. Permission to start test:

Jon Dan
US Signature

/
Date / Time

D.2. Core Spray System is in the standby lineup per QCOP 1400-01.

## E. PRECAUTIONS

E.1. **IF** MO 1(2)-1402-4A/B, CS BYP AND TEST VLV, is opened without the pump running **AND** system fill is lost, **THEN** the system must be refilled and vented.

E.2. An **alternate** suction pressure limit of ≥ 1 psig has been established to permit Core Spray testing during conditions when Torus level is below the normal band. **IF** this **alternate** limit is utilized, **THEN** limit Core Spray Pump flow rate to < 5000 gpm to ensure NPSH requirements are met.

E.3. **IF** the suction pressure is below the applicable suction pressure limit, **THEN** DO **NOT** run the Core Spray Pump. There is insufficient NPSH to run the pump and cavitation damage may occur.

## F. LIMITATIONS AND ACTIONS

F.1. Verification sections may be performed any time after the appropriate step is completed but must be completed prior to final acceptance of the surveillance.

F.2. Motor Operated Valves Guidelines: (J.8.a)

a. A maximum of five starts within a one-minute period, followed by 30 minutes cooling off time.

b. The valve is operable during the cooling off period.

c. **WHEN** throttle valves are required to adjust for flow or pressure, **THEN** it may be necessary to wait a few seconds to abide by this guideline.

F.3. **WHEN** a Core Spray Pump is run in the minimum flow mode of operation for a time period exceeding 10 minutes, **THEN notify** the IST group to perform a vibration analysis to ensure no pump degradation has occurred. Although the pump shall not be declared inoperable, the vibration analysis should be performed within 72 hours. (J.8.c)

F.4. **IF** a component fails to perform or fails to meet Tech Spec requirements, **THEN notify** the Unit Supervisor.

F.5. **IF** partial testing is required, **THEN** the Unit Supervisor will document in the prerequisites **EITHER** the steps to be performed **OR** the steps to be disregarded, **AND** any special instructions required for the performance of the partial test.

F.6. **IF** MO 1(2)-1402-38A/B, CS PMP MIN FLOW VALVE, fails in the open or closed position, **THEN** the respective Core Spray Pump should be shut down **AND** QCAP 0230-19 initiated. (J.1.a, J.8.e)

## G. PERFORMANCE ACCEPTANCE CRITERIA

G.1. Core Spray Pumps developed a flow rate of 4500 gpm discharge flow at a discharge pressure ≥ 216 psig. (J.1.b, J.1.c)

G.2. Core Spray discharge piping filled and vented. Water flow is observed through the sightglass within 39 seconds of opening the vent valves. An electronic stopwatch is not required for determining this time. The recorded time should be the operator's estimate and is expected to be accurate to within a few seconds. A venting time of greater than 39 seconds could be construed as a preconditioning action as described in NRC Information Notice 97-16, Preconditioning of Plant Structures, Systems, and Components Before ASME Code In-Service Testing or Technical Specification Surveillance Testing. Venting times less than 39 seconds assures that the system is capable of performing its design basis function regardless as to when the venting is performed in relation to the pump surveillance test. (J.6.b, J.8.f)

G.3. MO 1(2)-1402-38A/B, CS MIN FLOW VLV, automatically operated open and close when required.

G.4. Each Core Spray Pump suction pressure is ≥ 3 psig **OR** ≥ 1 psig **IF alternate** suction pressure limit is used.

## H. PROCEDURE

H.1 **Verify** Core Spray Subsystems filled and vented: (J.6.b)

N/A a. Core Spray Subsystem A:

(1) **Fully open** the following valves:

(a) 1(2)-1402-17A, 1(2)A CORE SPRAY INBD VENT VLV ____

(b) 1(2)-1402-18A, 1(2)A CORE SPRAY OUTBD VENT VLV. ____

(2) **Verify** water flows from vent line. ____

H.1.a. (cont'd)

N/A

(3) **Record** estimated time for water to flow after opening the vents. _____ seconds

(a) **Verify** time ≤ 39 seconds. ____

(b) **IF** time was > 10 seconds, **THEN**:

- **Initiate** a CR to document that a greater than normal amount of air was found in the system. ____
- **Record** the CR number as a deficiency at end of procedure. ____

(4) **Close** 1(2)-1402-18A, 1(2)A CORE SPRAY OUTBD VENT VLV. ____

(5) **Close** 1(2)-1402-17A, 1(2)A CORE SPRAY INBD VENT VLV. ____

(6) **IF** water does **NOT** flow when vented, **THEN**:

(a) **Notify** US. ____

(b) **Fill** and **vent** 1(2)A Core Spray Subsystem per QCOP 1400-01. ____

b. Core Spray Subsystem B:

(1) **Fully open** the following valves:

(a) 1(2)-1402-17B, 1(2)B CORE SPRAY INBD VENT VLV. JB/K

(b) 1(2)-1402-18B, 1(2)B CORE SPRAY OUTBD VENT VLV. JB/K

(2) **Verify** water flows from vent line. JB/K

(3) **Record** estimated time for water to flow after opening the vents. 5 seconds

(a) **Verify** time ≤ 39 seconds. K

H.1.b.(3) (cont'd)

(b) **IF** time was > 10 seconds, **THEN**:

- **Initiate** a CR to document that a greater than normal amount of air was found in the system. N/A
- **Record** the CR number as a deficiency at end of procedure. N/A

(4) **Close** 1(2)-1402-18B, 1(2)B CORE SPRAY OUTBD VENT VLV. JB/9

(5) **Close** 1(2)-1402-17B, 1(2)B CORE SPRAY INBD VENT VLV. JB/9

(6) **IF** water does **NOT** flow when vented, **THEN**:

(a) **Notify** US. N/A

(b) **Fill** and **vent** 1(2)B Core Spray Subsystem per QCOP 1400-01. N/A

H.2. **IF** Core Spray Subsystem A requires testing, **THEN**:

a. **IF** Torus level < -2 inches narrow range, **THEN** alternate suction pressure limit of ≥ 1 psig is met. N/A ____

b. **Establish** system flow and pressure by performing:

(1) **Start** 1(2)A CS Pump. ____

(2) **Verify** MO 1(2)-1402-38A, CS PMP MIN FLOW VLV, **opens**. ____

(3) **Open** MO 1(2)-1402-4A, CS BYP AND TEST VLV. ____

(4) **Verify** MO 1(2)-1402-38A **closes**. ____

(5) **Throttle** as necessary MO 1(2)-1402-4A to establish a flow rate of ≥ 4500 gpm at ≥ 216 psig. ____

H.2.b. (cont'd)

N/A

(6) **Record** pump suction pressure PI 1(2)-1402-40A (at pump). ____ psig

(7) **Verify** suction pressure is ≥ 3 psig **OR** if using alternate limit, suction pressure is ≥ 1 psig. ____

(8) **IF** suction pressure does **NOT** meet the above criteria, **THEN immediately stop** the Core Spray Pump. ____

(a) **Abort** the test. ____

(b) **Notify** the Unit Supervisor. ____

(9) **Record AND verify** criteria achieved:

| PARAMETER | MEASURED | LIMIT | PASS (INITIAL) |
|---|---|---|---|
| 1(2) Pump A Discharge Pressure | _____ psig PI 1(2)-1450-1A | 216 psig Minimum | _____ |
| 1(2) Pump A Discharge Flow | _____ gpm FI 1(2)-1450-4A | 4500 gpm Minimum | _____ |

c. **Shut down** system by:

(1) **Close** MO 1(2)-1402-4A. ____

(2) **Verify** MO 1(2)-1402-38A **opens** as system flow decreases. ____

(3) **Stop** 1(2)A CS PUMP. ____

(4) **Close** MO 1(2)-1402-38A. ____

d. **IF** over pressure condition (90 psig) in discharge piping exists after 1(2)A Core Spray Pump is stopped, **THEN**: (J.8.d)

(1) **Crack open** MO 1(2)-1402-4A to **slowly** reduce pressure. ____

(2) **Close** MO 1(2)-1402-4A when pressure reaches 90 psig as indicated on PI 1(2)-1450-1A, CS HEADER PRESS. ____

H.2. (cont'd)

N/A

e. **IF** pressure can **NOT** be maintained after performing depressurization step above, **THEN**: (J.8.d)

(1) **Open** MO 1(2)-1402-4A. ____

(2) **Close** MO 1(2)-1402-4A. ____

(3) **Fill** and **vent** 1(2)A Core Spray Subsystem per QCOP 1400-01. ____

H.3. **IF** Core Spray Subsystem B requires testing, **THEN**:

a. **IF** Torus level < -2 inches narrow range, **THEN alternate** suction pressure limit of ≥ 1 psig is met. N/A

b. **Establish** system flow and pressure by performing:

(1) **Start** 1(2)B CS Pump. JP

(2) **Verify** MO 1(2)-1402-38B **opens**. JP

(3) **Open** MO 1(2)-1402-4B. JP

(4) **Verify** MO 1(2)-1402-38B **closes**. ____

(5) **Throttle** as necessary MO 1(2)-1402-4B to establish a flow rate of ≥ 4500 gpm at ≥ 216 psig. ____

(6) **Record** pump suction pressure PI 1(2)-1402-40B (at pump). ____

(7) **Verify** suction pressure is ≥ 3 psig **OR** if using **alternate** limit, suction pressure is ≥ 1 psig. ____

(8) **IF** suction pressure does **NOT** meet the above criteria, **THEN immediately stop** the Core Spray Pump.

(a) **Abort** the test. ____

(b) **Notify** the Unit Supervisor. ____

H.3.b. (cont'd)

(9) **Record AND verify** criteria achieved:

| PARAMETER | MEASURED | LIMIT | PASS (INITIAL) |
|---|---|---|---|
| 1(2) Pump B Discharge Pressure | _____ psig<br>PI 1(2)-1450-1B | 216 psig Minimum | _____ |
| 1(2) Pump B Discharge Flow | _____ gpm<br>FI 1(2)-1450-4B | 4500 gpm Minimum | _____ |

c. **Shut down** system by:

(1) **Close** MO 1(2)-1402-4B. ____

(2) **Verify** MO 1(2)-1402-38B **opens** as system flow decreases. ____

(3) **Stop** 1(2)B CS PUMP. ____

(4) **Close** MO 1(2)-1402-38B. ____

d. **IF** over pressure condition (90 psig) in discharge piping exists after 1(2)B Core Spray Pump is stopped, **THEN**: (J.8.d)

(1) **Crack open** MO 1(2)-1402-4B to **slowly** reduce pressure. ____

(2) **Close** MO 1(2)-1402-4B when pressure reaches 90 psig, as indicated on PI 1(2)-1450-1B, CS HEADER. ____

e. **IF** pressure can **NOT** be maintained after performing depressurization step above, **THEN**: (J.8.d)

(1) **Open** MO 1(2)-1402-4B. ____

(2) **Close** MO 1(2)-1402-4B. ____

(3) **Fill** and **vent** 1(2)B Core Spray Subsystem **per** QCOP 1400-01. ____

H.4. **Perform** verification that Core Spray valves are in standby lineup:

a. Core Spray Subsystem A:

| Component | Position | |
|---|---|---|
| 1(2)-1402-17A | Closed | N/A |
| 1(2)-1402-18A | Closed | |
| MO 1(2)-1402-38A | Closed | |
| MO 1(2)-1402-4A | Closed | |
| 1(2)A CS PMP Switch | NORMAL | |

b. Core Spray Subsystem B:

| Component | Position | |
|---|---|---|
| 1(2)-1402-17B | Closed | ____ |
| 1(2)-1402-18B | Closed | ____ |
| MO 1(2)-1402-38B | Closed | ____ |
| MO 1(2)-1402-4B | Closed | ____ |
| 1(2)B CS PMP Switch | NORMAL | ____ |

H.5. **IF** this surveillance was satisfactory, **THEN**:

a. Satisfactory with discrepancies and corrective actions performed, as noted:

Yes _____ N/A _____

Comments: _____

_____

b. Surveillance performed by: _____ / _____
Signature Date

c. Surveillance approved by: _____ / _____
US Signature Date

H.6. **IF** this surveillance was unsatisfactory, **THEN**:

a. **OPERATOR**

(1) Description of deficiencies/comments:

_____

_____

(2) Work Request (WR) initiated:

Yes _____ No _____

(3) Surveillance performed by:

_____/_____
Signature Date

b. **UNIT SUPERVISOR**

(1) CR initiated:

Yes _____ No _____

(2) QCAP 0230-19 initiated:

Yes _____ No _____

(3) Additional corrective action:

_____

(4) Surveillance approved by:

_____/_____
Signature Date

H.7. **Attach** this completed surveillance to appropriate package **OR** Outage Report, as appropriate.

## I. ATTACHMENTS

None.

## J. REFERENCES

### J.1. Technical Specifications:

a. TS 3.3.5.1, Emergency Core Cooling System (ECCS) Instrumentation.

b. TS 3.5.1, ECCS - Operating.

c. TS 3.5.2, ECCS - Shutdown.

### J.2. P&IDs:

a. M-36 (M-78), Diagram of Core Spray Piping.

### J.3. Drawings:

None.

### J.4. Manuals:

None.

### J.5. Procedures:

a. QCOP 1400-01, Core Spray System Preparation for Standby Operation.

b. QCOP 1400-03, ECCS Fill System.

c. QCAP 0230-19, Equipment Operability.

d. QCOS 1400-02, Core Spray System Motor Operated Valve Operability Test.

e. QCOS 1400-01, Quarterly Core Spray System Flow Rate Test.

### J.6. UFSAR:

a. UFSAR 6.3.2.1, Core Spray Subsystem.

b. UFSAR 6.3.2.1.4, ECCS.

### J.7. Commitments:

None.

J.8. **Others:**

a. Eenigenburg Letter to R. Bax dated 10-28-85, Operational Guidelines for Motor Operated Valves.

b. Letter from D. Butcher to W. Koester 7-12-77, G-EBO-7-172 (Station Letter 77-2042).

c. NRC Bulletin 88-04 Potential Safety Related Pump Loss.

d. DVR 4-1-87-047, B Core Spray Header <40 psig.

e. K. Graesser Letter to N. Kalivianakas dated 12-4-85, ECCS Pump Minimum Flow Valves.

f. Design Analysis No. QDC-1400-M-1170.

g. QCPWG (Procedure Writers Guide), Vol. 3.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

(Student Copy)

- The Core Spray System is in its normal standby lineup IAW QCOP 1400-01.
- The Core Spray Pump Operability Test is required to be performed this shift.
- An EO has vented the core spray piping, performed pre-start checks on the 1B Core Spray pump, and is standing by outside the 1B Core Spray pump room.
- All personnel are cleared out of the 1B Core Spray room as controlled by the EO.
- This JPM is not time critical.

INITIATING CUE

Perform the Core Spray Pump Operability Test for the "1B" Core Spray Pump IAW QCOS 1400-04.

Exelon
Nuclear

# Nuclear Generation Group

# Job Performance Measure

Venting Of the Primary Containment due to High Hydrogen with a Failure of a Vent Valve to Open

JPM Number: B.1.f.

Revision Number: 1

Date: 9/2002

**Developed By:** Gary Thomas — **Instructor** — **Date** 10/10/02

**Validated By:** RC Marland — **SME or Instructor** — **Date** 10-11-02

**Review By:** M Swegle — **Operations Representative** — **Date** 10-11-02

# Job Performance Measure (JPM)

## Revision Record (Summary)

Revision 0, This JPM is developed IAW guidelines established in NUREG 1021 Rev 8 ES-301 and Appendix C. This JPM meets the criteria of Category B.1 "Control Room Systems," for RO/SRO candidates.

Revision 1 The JPM was revised to incorporate validation time and comments.

**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section at the bottom of the page. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

## Job Performance Measure (JPM)

### SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC 95 (rst 95 ). This IC is a shutdown reactor, stable following a scram and is setup specifically for this JPM. If it is not available follow the directions below.

2. IC Description: The Reactor is scrammed, Group II isolation in effect, DW pressure ≈ 8.6 psig, Torus pressure ≈ 6.9 psig.

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

3. **Manual Actuations:**

   - Depress both scram buttons to scram the Reactor then perform QCGP 2-3 actions.
   - Prevent HPCI injection by tripping HPCI with the trip latch.
   - Ensure reactor building vents have isolated and "B" SBGT train is operating.
   - Ensure AO-1601-61, 62, 63, 60, 23, 24 are closed.
   - Start the 7th DW cooler.

4. **Malfunctions:**

   - Cause a Group II Isolation to seal in using malfunction RP07. ***(imf rp07a) & (imf rp07b)***
   - Insert Main Steam line leak after the flow restrictors ***(imf ms05a 0.2)***
   - Override the 1-1601-61 valve closed ***(ior dihs1160161 close)***

5. **Remotes:** NONE

6. **Overrides:**

   - Override the Hydrogen recorder to 2.5 ***(ior aoh212406a 25)***

7. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

8. This completes the setup for this JPM.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

- A transient has occurred resulting in hydrogen generation.
- The US has entered the Hydrogen control procedure, QGA 200-5.
- Chemistry has sampled the containment atmosphere and determined that the offsite release rate will stay below the LCO when venting has commenced.
- Chemistry has recommended using SBGTS as a vent path.
- There are as many fans as possible operating.
- SBGT is operating.
- The Essential Service bus and both RPS busses are energized.
- Station Director has given permission to vent (NOT OK to exceed release rates).
- This JPM is not time critical.

INITIATING CUE

Line-up and begin venting the Torus through SBGT in accordance with QCOP 1600-13 to reduce hydrogen concentration in the containment.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

# Job Performance Measure (JPM)

JPM Start Time: 1409

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| | Obtain the procedure to be used. | Procedure QCOP 1600-13 obtained. | [ ] [ ] |
| F.2. | Verify closed the following Primary Containment valves: | Verify closed the following Primary Containment valves: | |
| | a. Torus 2" Vent vlv. | AO 1-1601-61, closed light lit. | [✓] [ ] [ ] |
| | b. DW 2" Vent vlv. | AO 1-1601-62, closed light lit. | [✓] [ ] [ ] |
| | c. Vent to SBGTS. | AO 1-1601-63, closed light lit. | [✓] [ ] [ ] |
| | d. Torus 18" Vent vlv. | AO 1-1601-60, closed light lit. | [✓] [ ] [ ] |
| | e. DW 18" Vent vlv. | AO 1-1601-23, closed light lit. | [✓] [ ] [ ] |
| | f. Vent to RX Bldg. Exh Sys. | AO 1-1601-24, closed light lit. | [✓] [ ] [ ] |
| F.3.a. | Verify "B" SBGTS train is running. | "B" train of SBGTS verified running. | [ ] [ ] [ ] |
| F.3.b. | Announce evacuation of SBGT area and that plant radiological conditions may change as containment is vented. | Announcement made over plant page. | [ ] [ ] [ ] |
| F.3.c. | Verify MASTER VENT MODE switch in NORM. | Verifies switch in NORM. | [ ] [ ] [ ] |
| F.3.d.(1) | Place the VENT ISOL SIG BYP key switch to TORUS position and verifies alarm actuates. | Switch is momentarily placed in TORUS position,<br>AND<br>alarm 901-3 A-15 verified on. | [ ] [ ] [ ] |
| F.3.d.(2) | Open Vent to SBGTS. | Positions AO 1-1601-63 CS to open open light lit. | [ ] [ ] [ ] |
| F.3.d.(3) | Attempts to open the Torus 2" Vent valve and recognizes valve fails to open. | Positions AO 1-1601-61 CS to open identifies valve did not change position, open light not lit. | [ ] [ ] |
| | Notifies US of valve failure to open. | Notifies US that 1-1601-61 valve failed to open. | [ ] [ ] [ ] |

# Job Performance Measure (JPM)

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| ***CUE: Acknowledge 1-1601-61 valve failed to open. If candidate stops at this point or requests direction from the US, ask them for their recommendation. If candidate does not offer a recommendation, tell them to continue on with procedure.***<br>***Note to evaluator: The next step in the procedure F.3.e. allows the candidate to vent the drywell if torus venting is not able to control hydrogen concentration as long as drywell pressure is less than 25psig.*** | | | |
| *F.3.e.(1) | Place the VENT ISOL SIG BYP key switch to DRYWELL position and verifies alarm actuates. | Switch is momentarily placed in DRYWELL position,<br>AND<br>alarm 901-3 A-15 verified on. | [ ] [ ] |
| F.3.e.(2) | Verifies Torus 2" Vent valve closed. | Verifies AO 1-1601-61 closed<br>closed light lit. | [ ] [ ] |
| *F.3.e.(3) | Open Vent to SBGTS. | Verifies AO 1-1601-63 open<br>open light lit. | [ ] [ ] |
| *F.3.e.(4) | Opens the Drywell 2" Vent valve. | Positions AO 1-1601-62 CS to open<br>open light lit. | [ ] [ ] |
| ***Evaluator Note: Due to simulator set-up for this JPM, drywell pressure and hydrogen concentration will not show a reducing trend so you must cue candidate that these parameters are decreasing.***<br>***Cue: Inform candidate that drywell pressure and hydrogen concentration is dropping.*** | | | |
| F.3.e.(6) | Monitor Release Rate. | Monitors, 1/2-1704-19, CHIMNEY GAS ACTIVITY recorder on Panel 912-4 AND 1/2-1740-202, MN CHIMNEY GAS ACTIVITY recorder 912-1. | [ ] [ ] [ ] |
| F.3.e.(6)(a) | Verify release rate limit is NOT being exceeded. | Contacts Chemistry or verifies absence of alarms 912-1 E-9 and F-9 on 912-1 to ensure limit is NOT being exceeded. | [ ] [ ] |
| F.3.e.(7) | Logs data in log book. | Log the following information in the Unit Log Book:<br>(a) Time of venting start & stop.<br>(b) Drywell and Torus pressure at time of vent start & stop. | [ ] [ ] |
| ***EVALUATOR: The candidate should inform you that the task is completed.*** | | | |

JPM Stop Time: 14:22

# Job Performance Measure (JPM)

Operator's Name: _____

Job Title: RO ❑ SRO ❑

JPM Title: Venting Of the Primary Containment due to High Hydrogen with a Failure of a Vent Valve to Open

JPM Number: B.1.f. Revision Number: 1

Task Number and Title:
SR-0001-P038, Post Accident Venting Of The Primary Containment

K/A Number and Importance:
**K/A**: 500000 EA1.03 **Rating:** 3.4/3.2

**Suggested Testing Environment:** Simulator

**Actual Testing Environment:** ❑ Simulator ❑ Plant ❑ Control Room

**Testing Method:** ❑ Simulate ❑ Perform **Faulted:** ❑ Yes ■ No **Alternate Path:** ■ Yes ❑ No

**Time Critical:** ❑ Yes ■ No

**Estimated Time to Complete:** 20 minutes **Actual Time Used:** 13 minutes

**References:** QCOP 1600-13, Rev. 15

# Job Performance Measure (JPM)

**EVALUATION SUMMARY:**

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____ (Print)

Evaluator's Signature: _____ Date: _____

# POST- ACCIDENT VENTING OF THE PRIMARY CONTAINMENT

## A. PURPOSE

The purpose of this procedure is to provide the necessary steps for post-accident venting the Primary Containment as directed by QGA or SAMGs procedures.

## B. DISCUSSION

B.1. Attachment A, POST-ACCIDENT VENTING FLOWCHART, is provided to accommodate quick execution of this procedure. It does **NOT** contain the level of detail that the text procedure contains, but represents the fundamental steps that must be performed in order to perform the task. The text procedure should be referenced if more detail is required. All supporting sections of the procedure (i.e., Precautions, Prerequisites, etc.) are applicable to the flowchart, as well as to the text procedure.

B.2. This procedure will ask the operator to verify that the radioactive release rate is less than the Technical Specification release rate LCO (ODCM). This can be accomplished by one of the following methods:

a. **IF** a release is in progress, **THEN** release rates less than the specified limit can be verified by the absence of alarms E-9 and F-9 on the 912-1 panel.

b. Calculate the release rate per QEP 0155-02 and verify that the release rate is less than the Unusual Event EAL.

c. **IF** a release is **NOT** in progress, **THEN** obtain a vent recommendation from Chemistry per QCCP 1300-01 **OR IF** there are indications of core damage, **THEN** QCHRSS 0700-02.

B.3. The preferred method for venting the Primary Containment is through the Torus. Studies performed by General Electric indicates a decontamination factor of up to four is provided when vented gases are required to bubble through water first. This will also help in preventing the Torus to Drywell Vacuum Breakers from cycling.

## C. PREREQUISITES

C.1. **IF** QGA or SAMG procedures do **NOT** state "OK to exceed Release Rate Limits," **THEN** vent recommendation provided by the Chemistry Department.

C.2. The RPS and Essential Service System (ESS) buses energized to supply power for vent valve solenoids.

a. **IF** power is unavailable from RPS to operate the valves in this procedure, **THEN** implement QCOP 1600-28 to install an alternate power supply.

## D. PRECAUTIONS

D.1. Venting the Primary Containment, irrespective of offsite radioactive release rates, is performed to preserve the structural integrity of Primary Containment **OR** to control Primary Containment Hydrogen concentration. If possible, the operator should attempt to limit the total amount of the radioactive release by controlling and maintaining pressure or Hydrogen concentration below their applicable limits rather than maintaining a continuous vent path. **WHEN** a vent path is being used to control Primary Containment parameters, **THEN** venting should maintain the following conditions:

a. **IF** the QGAs or SAMGs do **NOT** allow exceeding Release Rate Limits **AND** containment is being vented to control hydrogen concentration, **THEN** control hydrogen concentration below 0.5%.

b. **IF** the QGAs or SAMGs allow exceeding Release Rate Limits, **THEN:**

(1) **IF** venting to control pressure, **THEN** control below the Primary Containment Pressure Limit.

(2) **IF** venting to control hydrogen concentration, **THEN** control Primary Containment below 6%.

D.2. Venting the Primary Containment at high pressure can result in changing radiological conditions in the Reactor Building **AND** Turbine Building. **Refer** to QCOA 1800-01 **AND** QCOA 1800-02.

## E. LIMITATIONS AND ACTIONS

E.1. Simultaneous venting of Unit 1 and 2 via the Augmented Primary Containment Vent (APCV) system is **NOT** allowed since APCV has a common line to the chimney from each unit. **IF** required to vent both units, **THEN** the units should be alternately vented.

E.2. **IF** Primary Containment is being threatened, **THEN** the order of procedure steps can be altered to allow initiation of vent flow before dilution flow vent fans are started.

E.3. **IF** QGA and SAMG steps that direct venting are structured to allow the flexibility of venting before the applicable limit is reached, **THEN** appropriate timing of the vent should be determined using considerations presented the TSG Reference Manual, Attachment E. **Contact** the TSC for assistance in implementing this Attachment.

## F. PROCEDURE

F.1. **Operate** as many of the following fans as possible to provide dilution flow:

a. Turbine Building Exhaust Fan per QCOP 5750-01.

b. Radwaste Exhaust Fans per QCOP 5750-03.

F.2. **Verify closed:**

a. AO 1(2)-1601-61, TORUS 2-INCH VENT VLV. ✓

b. AO 1(2)-1601-62, DW 2-INCH VENT VLV. ✓

c. AO 1(2)-1601-63, VENT TO SBGTS. ✓

d. AO 1(2)-1601-60, TORUS 18-INCH VENT VLV. ✓

e. AO 1(2)-1601-23, DW 18-INCH VENT VLV. ✓

f. AO 1(2)-1601-24, VENT TO RX BLDG EXH SYS. ✓

## CAUTION

**IF** during performance of the following step the release rate exceeds the release rate limit referenced in the QGAs **OR** SAMGs **AND** the QGA **OR** SAMG procedures do **NOT** state "OK to exceed Release Rate Limits," **THEN** the vent operation must be terminated.

F.3. **IF** Drywell **OR** Torus pressure is less than 25 psig, **THEN** vent through SBGT using the 2-inch vent lines:

a. **Verify** a SBGT train in operation. CW

b. **Announce** evacuation of SBGT train area **AND** that plant radiological conditions may change as the Primary Containment is vented. C

c. **Verify** MASTER VENT MODE SWITCH in NORM. ✓

d. **IF** Torus level is less than 30 feet **AND** Torus pressure is less than 25 psig, **THEN vent** the Torus (H.8.e):

(1) **IF** a Group II Isolation signal is present **AND** Reactor Mode Switch is **NOT** in RUN, **THEN** momentarily **place** the VENT ISOL SIG BYP switch to TORUS position. **Verify** alarm 901(2)-3 A-15 actuates. ✓

(2) **Open** AO 1(2)-1601-63, VENT TO SBGTS. ✓

(3) **Open** AO 1(2)-1601-61, TORUS 2-INCH VENT VLV. ✗

(4) Control amount of vent flow by **cycling** AO 1(2)-1601-61, TORUS 2-INCH VENT VLV between the open and close positions as required to achieve the desired Primary Containment response.

F.3.d. (cont'd)

(5) **Monitor** 1/2-1705-19, CHIMNEY GAS ACTIVITY recorder on Panel 912-4 **AND** 1/2-1740-202, MN CHIMNEY GAS ACTIVITY recorder on 912-1.

(a) **IF** QGA or SAMG procedures do **NOT** state, "OK to exceed Release Rate Limits," **THEN verify** release rate limit referenced in the QGAs **OR** SAMGs is **NOT** being exceeded.

(6) **Log** the following information in the Unit Log Book:

(a) Time of vent start **AND** stop.

(b) Drywell and Torus pressure at time of vent start **AND** stop.

(e) **IF** Torus venting is **NOT** able to control Primary Containment pressure/hydrogen concentration **AND** Drywell pressure is less than 25 psig, **THEN vent** the Drywell (H.8.e.):

(1) **IF** a Group II Isolation signal is present **AND** Reactor Mode Switch is **NOT** in Run, **THEN** momentarily **place** the VENT ISOL SIG BYP switch to DRYWELL position. **Verify** alarm ✓ 901(2)-3 A-15 actuates.

(2) **Verify** close AO 1(2)-1601-61, TORUS 2-INCH ✓ VENT VLV.

(3) **Open** AO 1(2)-1601-63, VENT TO SBGTS. ✓

(4) **Open** AO 1(2)-1601-62, DW 2-INCH VENT VLV.

(5) Control amount of vent flow by **cycling** AO 1(2)-1601-62, DW 2-INCH VENT VLV between the open and close positions as required to achieve the desired Primary Containment response.

F.3.e. (cont'd)

(6) **Monitor** 1/2-1705-19, CHIMNEY GAS ACTIVITY recorder on Panel 912-4 **AND** 1/2-1740-202, MN CHIMNEY GAS ACTIVITY recorder on 912-1.

(a) **IF** QGA or SAMGs procedures do **NOT** state, "OK to exceed Release Rate Limits," **THEN verify** the release rate limit referenced in the QGAs **OR** SAMGs is **NOT** being exceeded.

(7) **Log** the following information in the Unit Log Book:

(a) Time of vent start **AND** stop.

(b) Drywell and Torus pressure at time of vent start **AND** stop.

f. **WHEN** any one of the following conditions is met, **THEN** continue with this procedure:

(1) Venting is complete.

(2) QGAs **OR** SAMGs do **NOT** give permission to exceed release rates **AND** release rates will be exceeded.

(3) QGAs give permission to exceed release rates **AND** the 2-inch vents are inadequate to accomplish the required venting.

(4) Pressure $\geq$ 25 psig in the area being vented.

g. **Terminate** venting through SBGT:

(1) **Close** AO 1(2)-1601-61, TORUS 2-INCH VENT VLV.

(2) **Close** AO 1(2)-1601-62, DRYWELL 2-INCH VENT VLV.

(3) **Close** AO 1(2)-1601-63, VENT TO SBGTS.

(4) **IF** a Group II Isolation signal was bypassed, **THEN reset** the Group II Isolation to clear the bypass signal. **Verify** alarm 901(2)-3 A-15 clears.

(5) **IF** SBGT is **NOT** required to remain operating, **THEN shut down** SBGT per QCOP 7500-02.

F.4. **IF** QGA procedures state, "OK to exceed Release Rate Limits," **THEN:**

a. **Evacuate** the Reactor Building **AND** Turbine Building.

b. **Place** MASTER VENT MODE SWITCH in APCV position.

c. **Verify** closed AO 1(2)-1699-7, VENT TO RX BLDG.

d. **Place** AO 1(2)-1601-24 CIS OVERRIDE in the OVERRIDE position **AND** hold for 1 second.

e. **Simultaneously place** AO 1(2)-1601-23 CIS OVERRIDE **AND** AO 1(2)-1601-60 CIS OVERRIDE in the OVERRIDE position **AND** hold for 1 second.

f. **Open** AO 1(2)-1601-24, VENT TO RX BLDG EXH SYS.

g. **IF** torus level is <30 feet, **THEN vent** the torus:

(1) **Open** AO 1(2)-1601-60, TORUS 18-INCH VENT VLV.

(2) **Open** AO 1(2)-1699-6, VENT TO MAIN CHIMNEY.

(3) Control amount of vent flow by **cycling** AO 1(2)-1699-6, VENT TO MAIN CHIMNEY between the open and close positions as required to achieve the desired Primary Containment response.

(4) **Monitor** 1/2-1705-19, CHIMNEY GAS ACTIVITY recorder on Panel 912-4 **AND** 1/2-1740-202, MN CHIMNEY GAS ACTIVITY recorder on 912-1 to verify proper documentation of the release.

(5) **Log** the following information in the Unit Log Book:

(a) Time of vent start **AND** stop.

(b) Drywell and Torus pressure at time of vent start **AND** stop.

F.4. (cont'd)

h. **IF** torus venting is **NOT** able to control Primary Containment pressure/hydrogen concentration **OR** torus level ≥ 30 ft., **THEN vent** the Drywell:

(1) **Verify** closed AO 1(2)-1601-60, TORUS 18-INCH VENT VLV.

(2) **Open** AO 1(2)-1601-23, DW 18-INCH VENT VLV.

(3) **Open** AO 1(2)-1699-6, VENT TO MAIN CHIMNEY.

(4) Control amount of vent flow by **cycling** AO 1(2)-1699-6, VENT TO MAIN CHIMNEY between the open and close positions as required to achieve the desired Primary Containment response.

(5) **Monitor** 1/2-1705-19, CHIMNEY GAS ACTIVITY recorder on Panel 912-4 **AND** 1/2-1740-202, MN CHIMNEY GAS ACTIVITY recorder on 912-1 to verify proper documentation of the release.

(6) **Log** the following information in the Unit Log Book:

(a) Time of vent start **AND** stop.

(b) Drywell and Torus pressure at time of vent start **AND** stop.

i. **WHEN** venting is complete, **THEN verify** closed AO 1(2)-1699-6, VENT TO MAIN CHIMNEY.

j. **WHEN** 10 minutes have elapsed, **THEN:**

(1) **Verify** closed AO 1(2)-1601-23, DW VENT VLV.

(2) **Verify** closed AO 1(2)-1601-60, TORUS VENT VLV.

k. **Close** AO 1(2)-1601-24, VENT TO RX BLDG EXH SYS.

l. **Place** MASTER VENT MODE SWITCH in NORM position.

F.4. (cont'd)

m. **WHEN** time **AND** radiation dose rates permit, **THEN** drain condensation from the containment vent line:

(1) **Contact** Mechanical Maintenance to install a hose connection on drain line 1(2)-1642-3/4", downstream of the 1(2)-1699-8 valve.

(2) **Route** hose to floor drain **AND throttle open** 1(2)-1699-8.

(3) **WHEN** draining is complete, **THEN close** 1(2)-1699-8.

## G. ATTACHMENTS

G.1. Attachment A Post-Accident Venting Flowchart.

## H. REFERENCES

### H.1. Technical Specifications:

a. TS Section 3.6.3.1, Primary Containment Oxygen Concentration.

b. TS Section 3.6.2.5, Drywell-to-Suppression Chamber Differential Pressure.

### H.2. P&IDs:

a. M-34 (M-76), Diagram of Pressure Suppression Piping.

b. M-44, Diagram of Standby Gas Treatment.

### H.3. Drawings:

a. 4E-1503B (4E-2503B), Schematic Diagram PIC System Panel 901(2)-15 Trip Logic and Condenser.

b. 4E-1509A/B Shts 1 & 2 (4E-2509A/B Shts 1 & 2), Schematic Diagram PCI System Atmosphere Control System.

c. 4E-1510 (4E-2510), Schematic diagram PCI System MO 1(2)-1601-57 & Miscellaneous Valves 1601-20A-20B.

## H.4. Manuals:

None.

## H.5. Procedures:

a. QCCP 1300-01, Drywell & Suppression Chamber Venting & Purging.

b. QCHRSS 0700-02, Containment Air Sampling Using the Gas Partitioner in Manual Mode.

c. QCOP 7500-01, Standby Gas Treatment System (SBGTS) Standby Operation and Start-up.

d. QCOP 7500-02, Standby Gas Treatment System (SBGTS) Shutdown.

e. QCOP 5750-01, Turbine Building Ventilation System.

f. QCOP 5750-02, Reactor Building Ventilation System.

g. QCOP 5750-03, Radwaste Building Ventilation System.

h. QCOA 1800-01, Area High Radiation.

i. QCOA 1800-02, High Airborne Activity.

j. QEP 0155-02, Estimating the Total Station Noble Gas Release Rate.

k. QCOP 1600-28, Installing Alternate Power Supply to Primary Containment Vent and Purge Valves.

## H.6. UFSAR:

a. Section 6.2, Containment Systems.

## H.7. Commitments:

None.

## H.8. Others

a. DVR 4-2-86-044, Loss of DW to Torus DP.

b. Generic Letter 89-16, U.S. Nuclear Regulatory Commission Letter "Installation of a Hardened Wetwell Vent," September 1, 1989.

c. Letter from Mr. M. H. Richter to U.S. Nuclear Regulatory Commission, "Quad Cities Station Units 1 and 2 Response to Generic Letter 89-16, October 30, 1989.

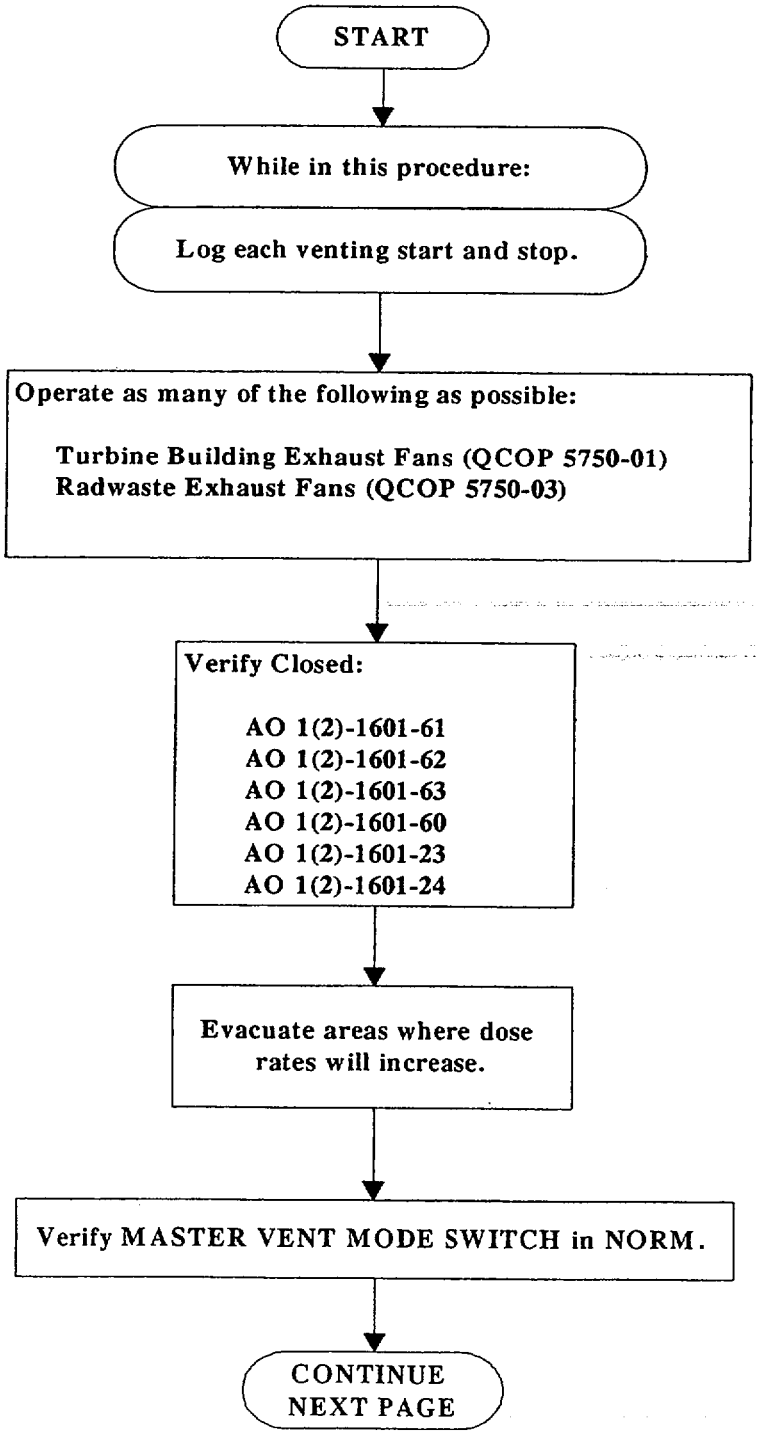
d. Quad Cities Unit 1 (DPR-29) and Unit 2 (DPR-30), Appendix A to Operating License DPR-29/30, Technical Specification and Bases, through Amendment 119/115 - September 1, 1989.

e. Letter/calculation from J.A. Dawn to R.L. Bax, #199972, Venting Containment through SBGT.

f. QCPWG (Procedure Writers Guide) Vol 3.

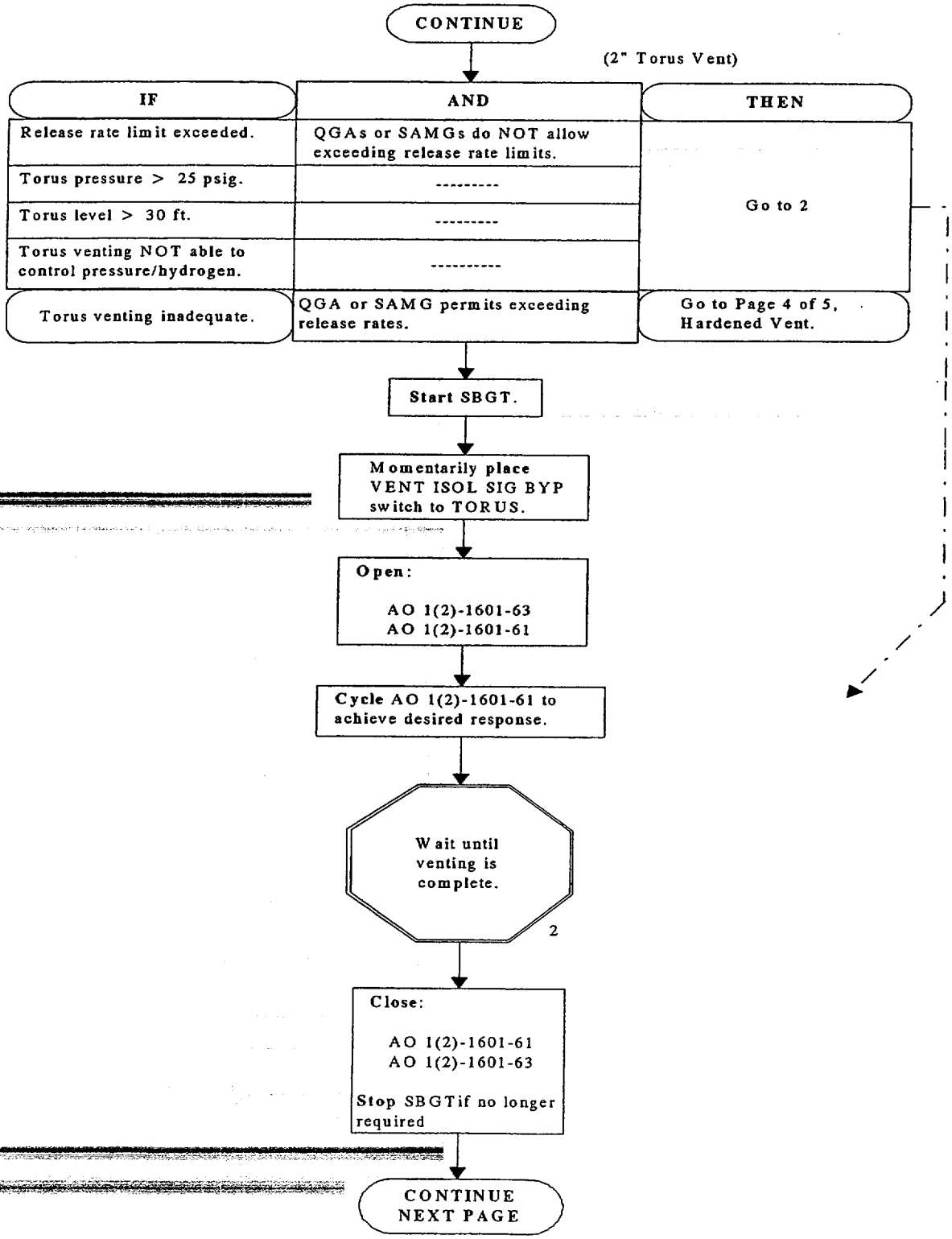
# ATTACHMENT A (Page 1 of 5)

## POST-ACCIDENT VENTING FLOWCHART



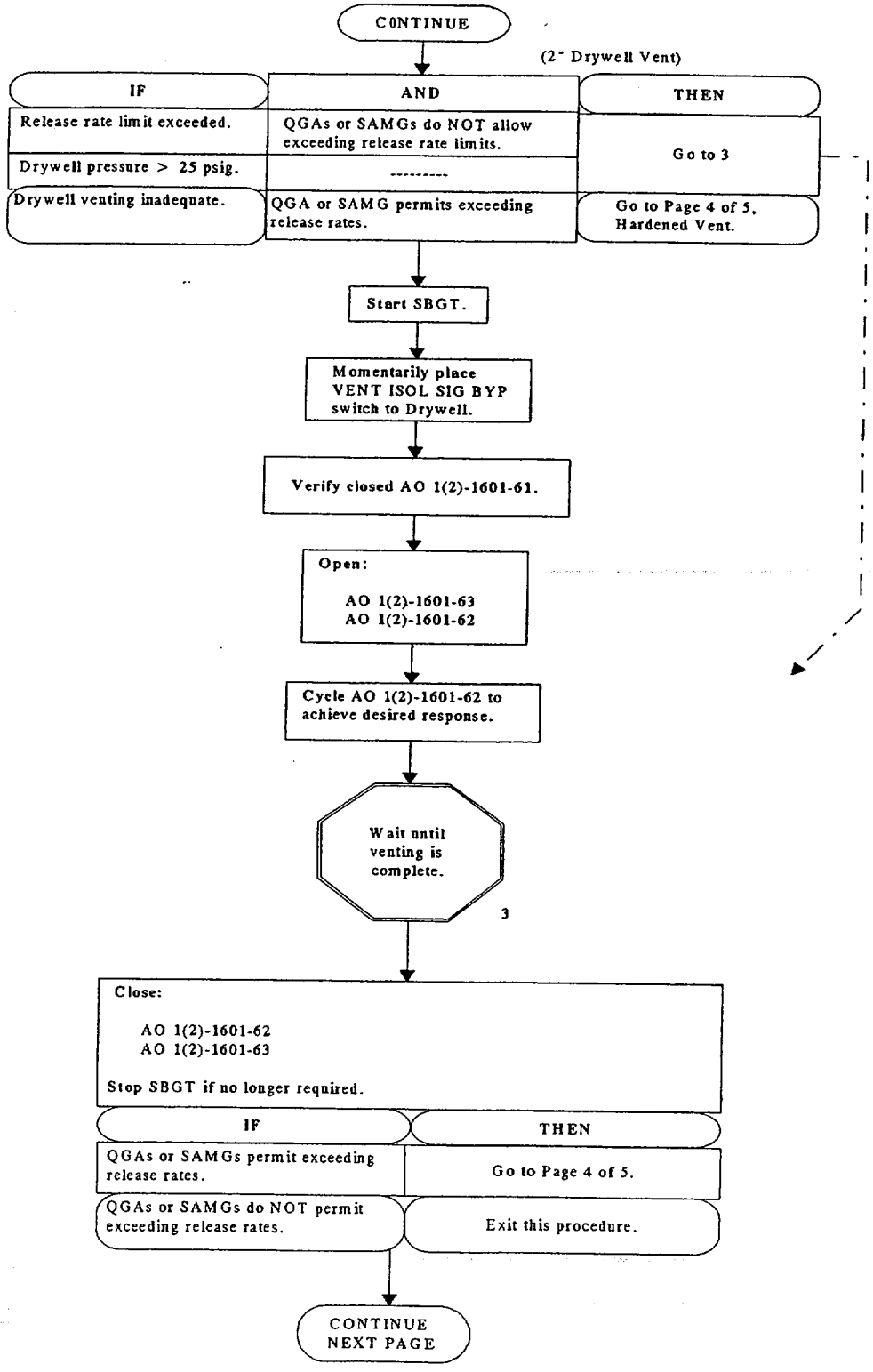
## ATTACHMENT A (Page 2 of 5)

# POST-ACCIDENT VENTING FLOWCHART



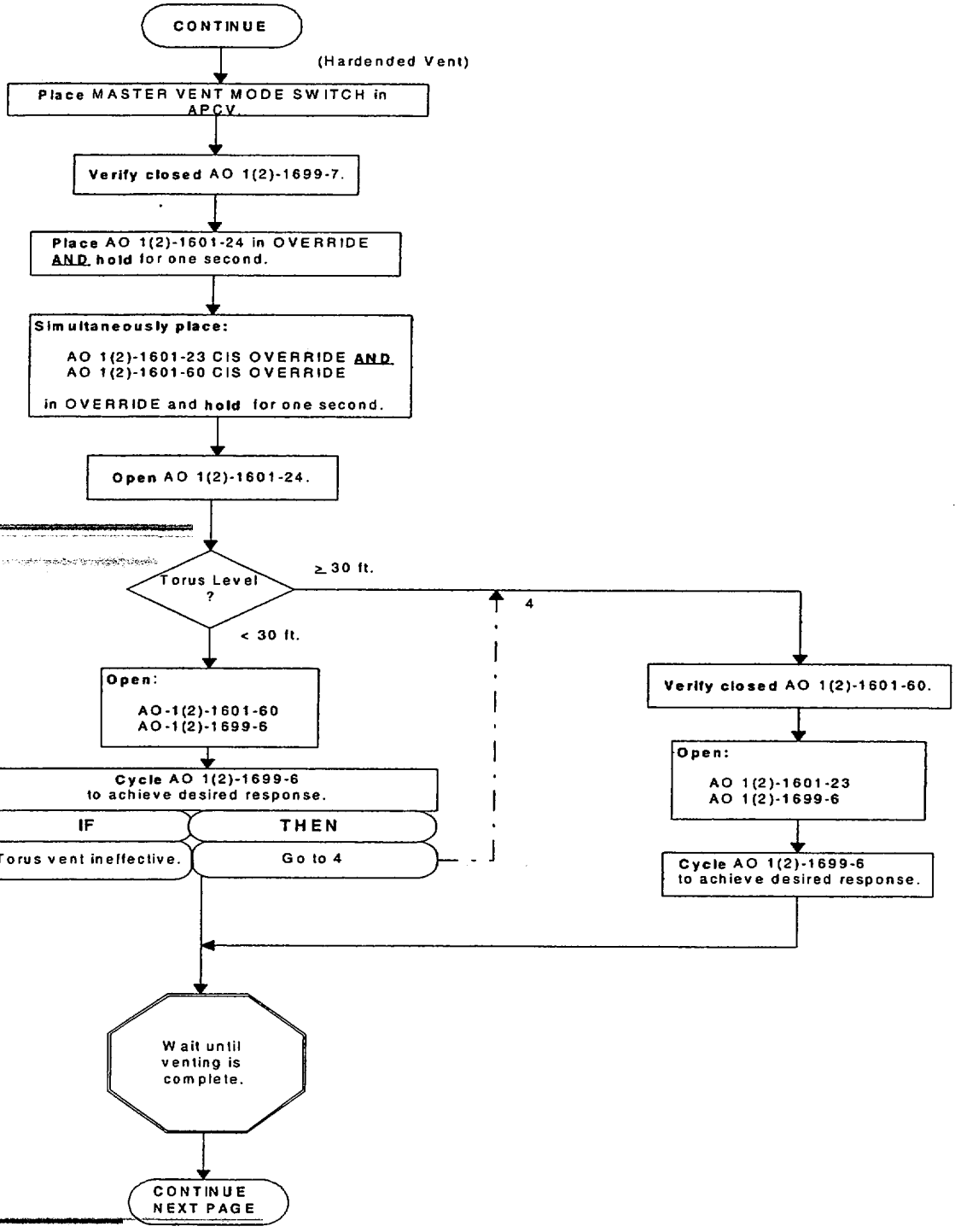
# ATTACHMENT A (Page 3 of 5)

## POST-ACCIDENT VENTING FLOWCHART



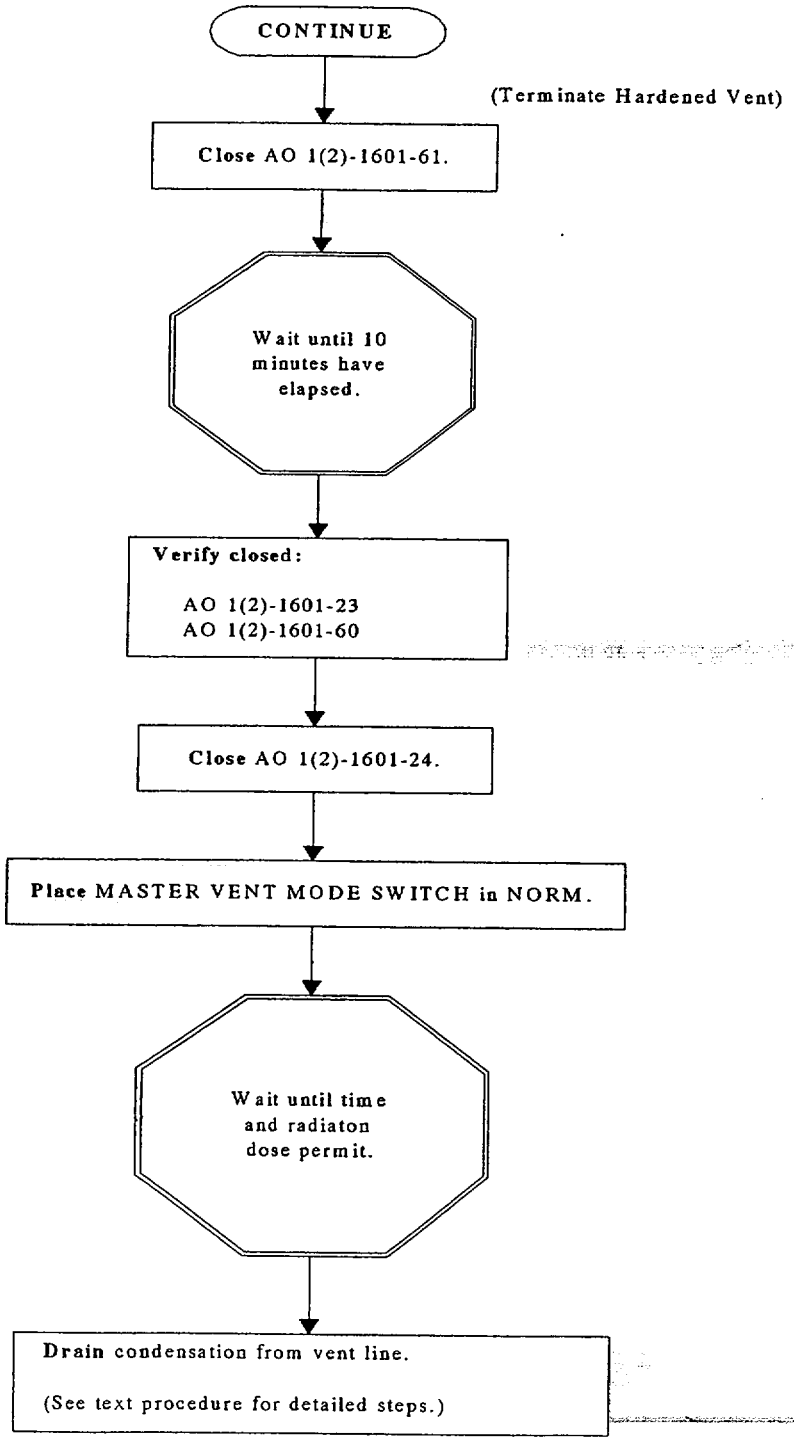
## ATTACHMENT A (Page 4 of 5)

# POST-ACCIDENT VENTING FLOWCHART



## ATTACHMENT A (Page 5 of 5)

# POST-ACCIDENT VENTING FLOWCHART



# Job Performance Measure (JPM)

## INITIAL CONDITIONS

(Student Copy)

- A transient has occurred resulting in hydrogen generation.
- The US has entered the Hydrogen control procedure, QGA 200-5.
- Chemistry has sampled the containment atmosphere and determined that the offsite release rate will stay below the LCO when venting has commenced.
- Chemistry has recommended using SBGTS as a vent path.
- There are as many fans as possible operating.
- SBGT is operating.
- The Essential Service bus and both RPS busses are energized.
- Station Director has given permission to vent (NOT OK to exceed release rates).
- This JPM is not time critical.

INITIATING CUE

Line-up and begin venting the Torus through SBGT in accordance with QCOP 1600-13 to reduce hydrogen concentration in the containment.

Exelon
Nuclear

# Nuclear Generation Group

# Job Performance Measure

Pressurize The Main Steam Lines

JPM Number: B.1.g.

Revision Number: 1

Date: 9/2002

| | | |
|---|---|---|
| **Developed By:** | Gary Thurner<br>**Instructor** | 10/10/02<br>**Date** |
| **Validated By:** | RC Mudbidri<br>**SME or Instructor** | 10-11-02<br>**Date** |
| **Review By:** | M Swezek<br>**Operations Representative** | 10-11-02<br>**Date** |

- had problem with IB inboard MSIV did not open

Set copy

# Job Performance Measure (JPM)

## Revision Record (Summary)

Revision 0, This JPM is developed IAW guidelines established in NUREG 1021 Rev 8 ES-301 and Appendix C. This JPM meets the criteria of Category B.1 "Control Room Systems," for RO/SRO candidates.

Revision 1 The JPM was revised to incorporate validation time and comments.

**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section at the bottom of the page. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

## SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC 94 (rst 94). This IC is a shutdown reactor, stable following a scram and is base IC setup specifically for this JPM.

2. **IC Description:**

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

3. **Manual Actuation:**

   - **Simulator operator must control reactor pressure manually with relief valves to control pressure 800-1000 psig while candidate is reopening the MSIVS.**

   - Ensure the Main Steam line drains are shut.

4. **Malfunctions:**

   - Allow Gp I isolation to cause scram by performing the following:

   - Insert, then remove, malfunction RP05 A & B.
     ***(imf rp05a) & (imf rp05b)***
     ***(dmf rp05a) & (dmf rp05b)***

5. **Remotes:** NONE

6. **Overrides:** NONE

7. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

8. This completes the setup for this JPM.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

- A Group I Isolation occurred approximately 30 minutes ago on Unit 1 due to low-low reactor water level.
- Reactor water level has been restored and is now being controlled by Feed/Condensate.
- Another RO will control pressure between 800 and 1000 psig with relief valves.
- The Main Steam Lines have been drained and the Steam line drain valves are shut.
- RPV level has been maintained less than 100" during the time the MSIVs have been closed.
- This JPM is not time critical

INITIATING CUE

Pressurize the Unit 1 Main Steam lines and re-open the MSIV's.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

# Job Performance Measure (JPM)

JPM Start Time: 1429

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT | UNSAT | N/A |
|---|---|---|---|---|---|
| | Obtain procedure to be used. | Procedure QCOP 250-1 obtained. | [ ] | [ ] | [ ] |
| *F.1. | Place MN STM ISOL RESET to INBD. | Places MN STM ISOL RESET to INBD. | [ ] | [ ] | |
| *F.2. | Place MN STM ISOL RESET to OUTBD. | Places MN STM ISOL RESET to OUTBD. | [ ] | [ ] | |
| F.3. | Adjust 1 A/B PRESS SETPOINT 200 psig above Reactor Pressure, OR as high as possible. | Adjusts 200 psig above reactor pressure or as high as possible. | [ ] | [ ] | [ ] |
| *F.4. | Open Outboard MSIVs:<br>a. AO 1-203-2A,<br>2A OUTBD MSIV<br>b. AO 1-203-2B,<br>2B OUTBD MSIV<br>c. AO 1-203-2C,<br>2C OUTBD MSIV<br>d. AO 1-203-2D<br>2D OUTBD MSIV | Opens outboard MSIVs by taking each C/S to OPEN on 901-3<br>AO 1-203-2A<br>red light lit indicating OPEN<br>AO 1-203-2B<br>red light lit indicating OPEN<br>AO 1-203-2C<br>red light lit indicating OPEN<br>AO 1-203-2D<br>red light lit indicating OPEN | [ ] | [ ] | |
| F.5. | Open Steamline drain valves:<br>a. MO 1-220-90A<br>STM LINE DRN VLV<br>b. MO 1-220-90B<br>STM LINE DRN VLV<br>c. MO 1-220-90C<br>STM LINE DRN VLV<br>d. MO 1-220-90D<br>STM LINE DRN VLV | Opens steamline drain valves by taking each C/S to OPEN on 901-3<br>MO 1-220-90A<br>red light lit indicating OPEN<br>MO 1-220-90B<br>red light lit indicating OPEN<br>MO 1-220-90C<br>red light lit indicating OPEN<br>MO 1-220-90D<br>red light lit indicating OPEN | [ ] | [ ] | [ ] |
| *F.6. | Equalize pressure across MSIVs:<br>a. Open MO 1-220-1,<br>STM DRN ISOL VLV<br>b. Open MO 1-220-2,<br>STM DRN ISOL VLV<br>c. Slowly throttle Open<br>MO 1-220-3,<br>OUTSIDE DRN VLV | Opens steam drain valve by taking each C/S to OPEN on 901-3.<br>MO 1-220-1<br>red light lit indicating OPEN<br>MO 1-220-2<br>red light lit indicating OPEN<br>MO 1-220-3<br>indicates Mid-position OR OPEN | [ ] | [ ] | |

# Job Performance Measure (JPM)

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| F.7. | Monitor the following indications AND verify that differential pressure across the MSIVs are decreasing<br><br>a. Reactor Pressure<br>b. PI 1-3040-10,<br>TURB THROT PRESS<br>(at panel 901-7) | Differential Pressure is decreasing using reactor pressure instrumentation and turbine throttle pressure on PI 1-3040-10 on 901-7. | [ ] [ ] [ ] |
| ***EVALUATORS NOTE: The next step is conditional and need not be performed to satisfactorily complete this task. Step will be performed only if D/P does not decrease to < 200 psid.*** | | | |
| F.8. | IF diff. press. across MSIVs does NOT dec. to <200 psid, THEN, at panel 901-7, close valves<br>a. MO 1-3004A, B, C and D,<br>CONT VLVS ABOVE SEAT DRN<br>b. MO 1-3005,<br>CONT VLVS BELOW SEAT DRN | May close above and below seat drains on 901-7 if D/P is not decreasing<br><br>MO 1-3004A, B, C and D green light lit indicating CLOSED<br><br>MO 1-3005 green light lit indicating CLOSED on 901-7. | [ ] [ ] [ ] |
| ***EVALUATOR: Unit Supervisor's permission is NOT a critical part of step F.9.***<br>***Candidate may elect to open 2 valves simultaneously to avoid a high flow isolation signal from occurring.*** | | | |
| *F.9. | WHEN diff. press. across the MSIVs is <200 psid<br>OR<br>has stopped decreasing and Unit Supervisor has given permission to proceed, THEN open inboard MSIVs:<br>a. AO 1-203-1A,<br>1A INBD MSIV<br>b. AO 1-203-1B,<br>1B INBD MSIV<br>c. AO 1-203-1C,<br>1C INBD MSIV<br>d. AO 1-203-1D<br>1D INBD MSIV | Opens inboard MSIVs by taking each C/S to OPEN on 901-3<br><br>OPENS AO 1-203-1A<br>red light lit indicating OPEN<br>OPENS AO 1-203-1B<br>red light lit indicating OPEN<br>OPENS AO 1-203-1C<br>red light lit indicating OPEN<br>OPENS AO 1-203-1D<br>red light lit indicating OPEN | [ ] [ ] |

# Job Performance Measure (JPM)

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| ***EVALUATOR: Step F.10 is conditional and need not be performed to satisfactorily complete this task.*** ***Cue candidate that step F.10 is NOT desired at this time, leave the valve closed.*** | | | |
| F.11. | Close Steamline drain valves:<br>a. MO 1-220-90A<br>STM LINE DRN VLV<br>b. MO 1-220-90B<br>STM LINE DRN VLV<br>c. MO 1-220-90C<br>STM LINE DRN VLV<br>d. MO 1-220-90D<br>STM LINE DRN VLV<br>e. MO 1-220-1,<br>STM DRN ISOL VLV<br>f. MO 1-220-2,<br>STM DRN ISOL VLV<br>g. MO 1-220-3,<br>OUTSIDE DRN VLV | Closes steam drain valves by taking each C/S to CLOSE on 901-3<br>MO 1-220-90A<br>green light lit indicating CLOSED<br>MO 1-220-90B<br>green light lit indicating CLOSED<br>MO 1-220-90C<br>green light lit indicating CLOSED<br>MO 1-220-90D<br>green light lit indicating CLOSED<br>MO 1-220-1<br>green light lit indicating CLOSED<br>MO 1-220-2<br>green light lit indicating CLOSED<br>MO 1-220-3<br>green light lit indicating CLOSED | [ ] [ ] [ ] |
| F.12. | Adjust 1A/1B PRESS SETPOINT to desired pressure. | EHC Pressure Setpoint adjusted to 920 psig (±10 psig) | [ ] [ ] [ ] |
| ***EVALUATOR: The candidate should inform you that the task is complete.*** | | | |

JPM Stop Time: 1450





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# Job Performance Measure (JPM)

Operator's Name: _____

Job Title: RO ❑ SRO ❑

JPM Title:Pressurize the Main Steam Lines

JPM Number: B.1.g. Revision Number: 1

Task Number and Title:
SR-0250-P01, Given a reactor plant at power when an inadvertent Group 1 isolation occurs, determine the cause, reset the Group 1, and re-open the MSIVs in accordance with QCOP 0250-01.

K/A Number and Importance:
**K/A**: 239001 A4.01 **Rating:** 4.2/4.0

**Suggested Testing Environment:** Simulator

**Actual Testing Environment:** ❑ Simulator ❑ Plant ❑ Control Room

**Testing Method:** ❑ Simulate ❑ Perform **Faulted:** ❑ Yes ■ No **Alternate Path:** ❑ Yes ■ No

**Time Critical:** ❑ Yes ■ No

**Estimated Time to Complete:** 25 minutes **Actual Time Used:** 21 minutes

**References:** QCOP 250-01, Rev. 5

# Job Performance Measure (JPM)

**EVALUATION SUMMARY:**

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____ (Print)

Evaluator's Signature: _____ Date: _____





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# Job Performance Measure (JPM)

## INITIAL CONDITIONS

(Student Copy)

- A Group I Isolation occurred approximately 30 minutes ago on Unit 1 due to low-low reactor water level.
- Reactor water level has been restored and is now being controlled by Feed/Condensate.
- Another RO will control pressure between 800 and 1000 psig with relief valves.
- The Main Steam Lines have been drained and the Steam line drain valves are shut.
- RPV level has been maintained less than 100" during the time the MSIVs have been closed.
- This JPM is not time critical

INITIATING CUE

Pressurize the Unit 1 Main Steam lines and re-open the MSIV's.





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# PRESSURIZING THE MAIN STEAM LINES

## A. PURPOSE

The purpose of this procedure is to provide instructions for pressurizing the Main Steam Lines during a Unit Startup **OR** when recovering from a Group I Primary Containment Isolation.

## B. DISCUSSION

None.

## C. PREREQUISITES

C.1. **IF** QGAs direct bypassing one or more Group I Isolation Signals, **THEN** signal has been bypassed per QCOP 0201-10 **OR** QCOP 0250-02, as specified in the QGAs. N/A

C.2. RPV level has been maintained $\leq$ 100 inches during the time the MSIVs have been closed. ✓

## D. PRECAUTIONS

**NOTE**

The following precaution does **NOT** apply when the QGA procedures direct use of this procedure to depressurize the RPV and permission has been given to exceed RPV cooldown rates.

D.1. During the performance of this procedure, caution should be used when opening Main Steam Line Drain Valves to ensure that Reactor cooldown rate does **NOT** exceed 100°F/hour.

## E. LIMITATIONS AND ACTIONS

None.

## F. PROCEDURE

F.1. **Place** MN STM ISOL RESET to INBD position. ✓

F.7. **Monitor** differential pressure decreasing across the MSIVs by monitoring Reactor Pressure **AND** 1(2)-3040-10, TURB THROT PRESS (at 901(2)-7 Panel). N

F.8. **IF** differential pressure across MSIVs does **NOT** decrease to < 200 psid, **THEN** at Panel 901(2)-7, **close**:

a. MO 1(2)-3004A,B,C and D, CONT VLVS ABOVE SEAT DRN. N/A

b. MO 1(2)-3005, CONT VLVS BELOW SEAT DRN. N/A

## CAUTION

**IF** Inboard MSIVs are going to be opened with a dP present, **THEN** consideration should be given to opening two (2) valves simultaneously in order to avoid a possible Group I isolation due to Main Steam Line high flow rates.

F.9. **WHEN** differential pressure across the MSIVs is < 200 psid, **OR** has stopped decreasing and Unit Supervisor has given permission to proceed, **THEN open** Inboard MSIVs:

a. AO 1(2)-203-1A, 1A INBD MSIV. N

b. AO 1(2)-203-1B, 1B INBD MSIV. N

c. AO 1(2)-203-1C, 1C INBD MSIV. N

d. AO 1(2)-203-1D, 1D INBD MSIV. N

F.10. **IF** desired, **THEN open** the following valves:

a. MO 1(2)-3004A,B,C and D, CONT VLVS ABOVE SEAT DRN. ____

b. MO 1(2)-3005, CONT VLVS BELOW SEAT DRN. ____

c. One of the following:

(1) AO 1(2)-5401A and B, SJAE SUCT VLVS. ____

(2) AO 1(2)-5402A and B, SJAE SUCT VLVS. ____

F.11. **Close** drain valves:

a. MO 1(2)-220-90A, STM LINE DRN VLV. ____

b. MO 1(2)-220-90B, STM LINE DRN VLV. ____

c. MO 1(2)-220-90C, STM LINE DRN VLV. ____

d. MO 1(2)-220-90D, STM LINE DRN VLV. ____

e. MO 1(2)-220-1, STM DRN ISOL VLV. ____

f. MO 1(2)-220-2, STM DRN ISOL VLV. ____

g. MO 1(2)-220-3, OUTSIDE DRN VLV. ____

F.12. **Adjust** 1(2)A/B PRESS SETPOINT to desired pressure. ____ I

## G. ATTACHMENTS

None.

## H. REFERENCES

H.1. **Technical Specifications:**

None.

H.2. **P&IDs:**

None.

H.3. **Drawings:**

a. M-13 (M-60), Diagram of Main Steam Piping.

b. 4E-1505 (4E-2505), Schematic Diagram PCI System.

H.4. **Manuals:**

None.

H.5. **Procedures:**

a. QCOP 0201-10, Bypassing Isolation Signals to Allow Drywell Flooding or Alternate RPV Blowdown.

b. QCOP 0250-02, Bypassing MSIV Low Low Reactor Water Level Group I Isolation Signal.

## H.6. UFSAR:

None.

## H.7. Commitments:

None.

## H.8. Others:

a. QCPWG (Procedure Writers Guide) Vol 3.

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# Nuclear Generation Group

# Job Performance Measure

Aligning Fire Protection Water to SSMP Room Cooler

JPM Number: B.2.a.

Revision Number: 01

Date: 09/2002

| | | |
|---|---|---|
| **Developed By:** | Instructor | Date |
| **Validated By:** | SME or Instructor | Date |
| **Review By:** | Operations Representative | Date |

# Job Performance Measure (JPM)

## Revision Record (Summary)

Revision 0, The reason for this JPM is to demonstrate the ability to terminate one of the twenty most probable Core Damage Sequences.

This JPM is developed IAW guidelines established in NUREG 1021 Rev 8 ES-301 and Appendix C. This JPM meets the criteria of Category B.2 "Facility Walk-Through," for RO/SRO candidates.

Revision 1 The JPM was revised to incorporate validation time and comments.

**Information For Evaluator's Use:**

All components are located in the Safe Shutdown Makeup Pump Room on the south wall.

UNSAT requires written comments on respective step.

*Denotes CRITICAL steps.

Note step #3 is not critical due to having the bypass valve open is a normal lineup for this system unless freon head pressure for the room cooler is >260 psig. This was validated by the Facility Representative.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section at the bottom of the page. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

## Job Performance Measure (JPM)

### INITIAL CONDITIONS

- There is a severe fire in RB 1S. SSMP is the injection source for U-1. Service Water is no longer available to the SSMP Room Cooler.
- You have been issued a flashlight, radio, and the AR tool box which includes; a V-key, an R-Key, VHR-key, a Fire Lock key, an S-Key, a straight blade screwdriver, a wire cutters, a crescent wrench.
- This JPM is not time critical.

INITIATING CUE

Align Fire Protection Water to SSMP Room Cooler in accordance with QCARP 0010-01 Attachment D.

**Provide examinee with:**

Copy of QCARP 0010-01 Attachment D.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

## Job Performance Measure (JPM)

JPM Start Time: _____

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| *Attachment D, step 1 | **Close** 1/2-2901-25, SERV WTR TO SAFE SHUTDOWN PMP RM HVAC CLR SV. | Turns 1/2-2901-25 valve hand wheel clockwise until valve no longer moves. | [ ] [ ] [ ] |
| ***CUE:*** ***Indicate to the candidate that the valve will not longer turn after the proper technique is demonstrated.*** | | | |
| *Attachment D, step 2 | **Unlock** and **Open** ½-2901-9 FIRE PROTECTION WTR TO SAFE SHUTDOWN PMP RM HVAC CLR SV. | Selects "S" Key and unlocks ½-2901-9 turns valve hand wheel counterclockwise until valve no longer moves. | [ ] [ ] [ ] |
| ***CUE:*** ***Indicate to the candidate that the lock is unlocked and that the valve will no longer turn after the proper technique is demonstrated.*** Manip Critical Step not critical | | | |
| Attachment D, step 3 * | **Close** 1/2-2999-9, SERVICE WATER TO SSMP ROOM COOLER BYPASS VALVE. | Turns 1/2-2999-9 valve hand wheel clockwise until valve no longer moves. | [ ] [ ] [ ] |
| **CUE: Indicate to the candidate that the valve will not longer turn after the proper technique is demonstrated.** | | | |
| Attachment D, step 4 | **Verify** SSMP Room Cooler Operation. | Checks to see if cooler is cooling room. | [ ] [ ] [ ] |
| ***CUE:*** ***After proper checks are made for Cooler operation (Proper checks should include that the candidate listens or feels for cool air flow discharging from the cooler, or verifying that the room is getting cooler), indicate to the candidate that the room is becoming cooler.*** | | | |
| Attachment D, step 5 | **Notify** U1 US that steps are complete. | Proper communication techniques. | [ ] [ ] [ ] |
| ***CUE:*** ***When informed, acknowledge as Unit One Unit Supervisor that you understand that the SSMP Room Cooler is lined up to the fire header.*** | | | |
| ***Evaluator Note: Candidate should state that the JPM is complete.*** | | | |

*CRITICAL STEP

JPM Stop Time:_____

# Job Performance Measure (JPM)

Operator's Name: _____

Job Title: RO ❑ SRO ❑

JPM Title: Align Fire Protection Water to SSMP Room Cooler

JPM Number: B.2.a. Revision Number: 1

Task Number and Title:

**SN 2900-P08** Given Unit 1 in an QCARP condition, transfer SSMP HVAC cooling water supply to the fire header and verify SSMP room cooler operation in accordance with QCARP 0010-01 Attachment D. (Important PSA task/transferring cooling water supply has Risk Achievement Worth (RAW) ranging from 1.25 alone to 655 in combination with other actions. Accomplishing this task terminates 1 of the 20 most probable core damage sequences)

K/A Number and Importance:

**K/A:** 295018 AA1.01 **RATING:** 3.3/3.4

**Suggested Testing Environment:** Plant

**Actual Testing Environment:** ❑ Simulator ❑ Plant ❑ Control Room

**Testing Method:** ❑ Simulate ❑ Perform **Faulted:** ❑ Yes ■ No **Alternate Path:** ❑ Yes ■ No

**Time Critical:** ❑ Yes ■ No

**Estimated Time to Complete:** 10 minutes **Actual Time Used:** _____ minutes

**References:** QCARP 0010-01 Attachment D, Rev. 1





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# Job Performance Measure (JPM)

**EVALUATION SUMMARY:**

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ Date: _____

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

(Student Copy)

- There is a severe fire in RB 1S. SSMP is the injection source for U-1. Service Water is no longer available to the SSMP Room Cooler.
- You have been issued a flashlight, radio, and the AR tool box which includes; a V-key, an R-Key, VHR-key, a Fire Lock key, an S-Key, a straight blade screwdriver, a wire cutters, a crescent wrench.
- This JPM is not time critical.

INITIATING CUE

Align Fire Protection Water to SSMP Room Cooler in accordance with QCARP 0010-01 Attachment D.

Candidate Copy



## ATTACHMENT D (Page 1 of 1)
## ALIGNING FIRE PROTECTION WATER TO SSMP ROOM COOLER

1. **Close** 1/2-2901-25, SERV WTR TO SAFE SHUTDOWN PMP RM HVAC CLR SV. ____

2. **Unlock** and **open** 1/2-2901-9, FIRE PROTECTION WTR TO SAFE SHUTDOWN PMP RM HVAC CLR SV. ____

3. **Close** 1/2-2999-9, SERVICE WATER TO SSMP ROOM COOLER BYPASS VALVE. ____

4. **Verify** SSMP Room Cooler operation. ____

5. **Notify** U1 US that steps are complete. ____

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# Nuclear Generation Group

# Job Performance Measure

Depressurize the Scram Air Header

JPM Number: B.2.b.

Revision Number: 1

Date: 09/2002

| | | |
|---|---|---|
| **Developed By:** | Instructor | 10/10/02 Date |
| **Validated By:** | SME or Instructor | 10-11-02 Date |
| **Review By:** | Operations Representative | 10-11-02 Date |

CRD 0301-10
CRD CLG WTR-FCV

# Job Performance Measure (JPM)

## Revision Record (Summary)

Revision 0 This JPM is developed IAW guidelines established in NUREG 1021 Rev 8 ES-301 and Appendix C. This JPM meets the criteria of Category B.2 "Facility Walk-Through," for RO/SRO candidates.

Revision 1 The JPM was revised to incorporate validation time and comments.

**Information For Evaluator's Use:**

All components are located in the U-2 reactor building 595' elevation near the southeast corner of the north CRD bank.

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section at the bottom of the page. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

# Job Performance Measure (JPM)

## INITIAL CONDITIONS

- An ATWS has occurred on Unit 2 with reactor power currently at 35%.
- The Control Room is in QGA 101 and attempting to insert Control Rods.
- The Unit Supervisor has directed performance of QCOP 0300-28
- This JPM is not time critical

INITIATING CUE

Vent the U-2 scram air header to insert control rods in accordance with QCOP 0300-28 step F.3.

Provide candidate a copy of QCOP 0300-28.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

# Job Performance Measure (JPM)

JPM Start Time: _____

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| | | | |
| *F.3.a.(1) | **Close OR verify closed** both 2-301-147A **AND** B, INST AIR TO SCRAM VLV PILOT AIR HDR A/B (FILT) INLET VLV. | Rotates 2-301-147A **AND** 147B handwheels clockwise until they do not turn any further. | [ ] [ ] [ ] |
| **Cue: You have rotated the handwheels clockwise and they will not turn any further.** | | | |
| *F.3.a.(2) | **Manually open** RV 2-0399-24 SCRAM AIR RELIEF VALVE RV, by lifting the relief valve handle. | Lifts handle on RV 2-0399-24. | [ ] [ ] [ ] |
| **Cue: You heard air blowing for several seconds, the flow then slowed and finally stopped. The Control Room reports that all the control rods have fully inserted. Restore the scram air header.** | | | |
| F.3.b.(1) | **Close** RV 2-0399-24 SCRAM AIR RELIEF VALVE RV. | Releases handle on RV 2-0399-24. | [ ] [ ] [ ] |
| **Cue: You have released the handle on the Relief Valve and it has returned to its original position.** | | | |
| F.3.b.(2) critical 0 | **Open** either the 2-301-147A **OR** B, INST AIR TO SCRAM VLV PILOT AIR HDR A/B (FILT) INLET. | Rotates 2-301-147A **OR** 147B handwheel counterclockwise until it does not turn any further. | [ ] [ ] [ ] |
| **Cue: You have rotated the handwheel counterclockwise and it will not turn any further. If asked, scram air header pressure indication is 70 psig and rising.** | | | |
| **EVALUATOR: The candidate should inform you that the task is complete.** | | | |

JPM Stop Time:_____

# Job Performance Measure (JPM)

Operator's Name: _____

Job Title: RO ❑ SRO ❑

JPM Title: Depressurize the scram air header

JPM Number: B.2.b. Revision Number: 1

Task Number and Title:

**SRN-0300-TP019** - Given a reactor plant in an ATWS condition (QGA), locally isolate and depressurize the scram air header in accordance with QCOP 300-28.

K/A Number and Importance:

**K/A**: 295037 EA1.03 **Rating**: 4.1/4.1

**Suggested Testing Environment:** Plant

**Actual Testing Environment:** ❑ Simulator ❑ Plant ❑ Control Room

**Testing Method:** ❑ Simulate ❑ Perform **Faulted:** ❑ Yes ■ No **Alternate Path:** ❑ Yes ■ No

**Time Critical:** ❑ Yes ■ No

**Estimated Time to Complete:** 10 minutes **Actual Time Used:** ____ minutes

**References:** QCOP 0300-28 Rev. 19

# Job Performance Measure (JPM)

**EVALUATION SUMMARY:**

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ Date: _____

Candidate Copy



# ALTERNATE CONTROL ROD INSERTION

## A. PURPOSE

The purpose of this procedure is to provide alternate methods for inserting Control Rods when Control Rods did **NOT** insert on a Reactor Scram condition.

## B. DISCUSSION

B.1. Attachment A, ALTERNATE CONTROL ROD INSERTION FLOWCHART, is provided to accommodate quick execution of this procedure. It does **NOT** contain the level of detail that the text procedure contains, but represents the fundamental steps that must be performed in order to perform the task. The text procedure should be referenced if more detail is required and to document restoration for systems that were altered to accomplish rod insertion. All supporting sections of the procedure (i.e., Precautions, Prerequisites, etc.) are applicable to the flowchart as well as to the text procedure.

B.2. This procedure provides several alternate methods for Control Rod insertion. The alternate methods described in this procedure fall into two categories; insertion of all Control Rods simultaneously and individual Control Rod insertion. Simultaneous insertion of all Control Rods is the preferred method but individual Control Rod insertion should be performed concurrently.

B.3. Methods for inserting all Control Rods simultaneously:

a. De-energizing Scram Solenoids.

This step removes the scram solenoid fuses to open all the scram valves.

b. Depressurizing Scram Air Header.

This step vents the air in the scram air header to fail open the scram valves.



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B.3 (cont'd)

c. Manual Reactor Scram.

This step provides for resetting the Reactor scram (by normal means or by jumpering out all Reactor scram signals and ARI) to allow draining of the Scram Discharge Volume and insertion of a manual scram signal.

B.4. Methods that insert one Control Rod at a time:

a. Individual Control Rod Scramming.

This step provides for resetting the Reactor scram (by normal means or by jumpering out all Reactor scram signals and ARI) to allow draining of the SDV and individual scram insertion of Control Rods from the scram test panel.

b. Manual Control Rod insertion.

This step provides for inserting Control Rods by use of the normal Reactor Manual Control System.

B.5. Verification steps within this procedure may be performed when time permits and therefore are allowed to be performed out of sequence.

## C. PREREQUISITES

C.1. QGAs **OR** SAMGs have directed use of this procedure.

## D. PRECAUTIONS

D.1. **Exercise** caution when installing jumpers **OR** blocks due to potentially energized circuits.

## E. LIMITATIONS AND ACTIONS

E.1. **IF** the POWER leg of QGA 101 is exited **AND** SAMG is **NOT** in progress, **THEN**:

a. **IF** Boron injection is in progress, **THEN terminate** Boron injection.

b. **Enter** QCGP 2-3.

c. **Continue** this procedure at step F.8.

E.2. **IF** repetitive steps are in progress that insert individual control rods (e.g., manual insertion using RMC, individual rod scramming, etc.) **AND** the method is **NOT** successful, **THEN** that method may be stopped following 2 or 3 attempts on rods associated with each CRD bank.

E.3. Documentation of jumper or fuse manipulation may be performed any time after the appropriate step is completed and will typically be done when plant conditions are stable enough to allow sufficient time.

## F. PROCEDURE

F.1. **IF** ALL Scram Valves are open, as indicated by the blue scram lights on the full core display being lit, **THEN go to** step F.4. ____

**NOTE**

The next three steps of this procedure are to be implemented concurrently. Completion of the next three steps is **NOT** required prior to implementing subsequent procedure steps. The next three steps are:

De-energizing scram solenoids.
Venting the scram air header.
Manual control rod insertion.

F.2. **IF** ALL Scram Valves are **NOT** open, as indicated by the blue scram lights **NOT** being lit on full core display, **THEN remove** the following fuses to de-energize the scram solenoids:

a. At Panel 901(2)-15, Terminal Board "C":

(1) 590-715A, F5. ____

(2) 590-715C, F6. ____

(3) 590-715E, F7. ____

(4) 590-715G, F8. ____

F.2 (cont'd)

b. At Panel 901(2)-17 Terminal Board "C":

(1) 590-715B, F5. ____

(2) 590-715D, F6. ____

(3) 590-715F, F7. ____

(4) 590-715H, F8. ____

c. **WHEN** Control Rods stop moving inward **OR NO** Control Rod movement occurs, **THEN re-install** fuses:

(1) At Panel 901(2)-15, Terminal Board "C":

(a) 590-715A, F5. ____

(b) 590-715C, F6. ____

(c) 590-715E, F7. ____

(d) 590-715G, F8. ____

(2) At Panel 901(2)-17 Terminal Board "C":

(a) 590-715B, F5. ____

(b) 590-715D, F6. ____

(c) 590-715F, F7. ____

(d) 590-715H, F8. ____

F.3. **IF** ALL Scram Valves are **NOT** open, as indicated by the blue scram lights **NOT** being lit on full core display, **THEN vent** the scram air header:

**NOTE**

While the scram air header is bled down in this step, it may **NOT** be possible to drive rods manually due to loss of motive air to FCVs.

a. On Reactor Building 1st Floor by Control Rod Drive Flow Control Station:

(1) **Close OR verify closed** both 1(2)-301-147A **AND** B, INST AIR TO SCRAM VLV PILOT AIR HDR A/B (FILT) INLET VLV. ____

(2) **Manually open** RV 1(2)-0399-24, SCRAM AIR RELIEF VALVE RV, by lifting the relief valve handle. ____

b. **WHEN** Control Rods stop moving inward **OR NO** Control Rod movement occurs, **THEN restore** Scram Air Header:

(1) **Close** RV 1(2)-0399-24, SCRAM AIR RELIEF VALVE RV. ____

(2) **Open** either the 1(2)-301-147A **OR** B, INST AIR TO SCRAM VLV PILOT AIR HDR A/B (FILT) INLET VLV, that was repositioned in step F.3.a.(1). ____

F.4. **Perform** manual Control Rod insertion:

a. **IF** a CRD Pump is **NOT** operating, **THEN start** a CRD Pump per QCOP 0300-01. ____

b. **IF NEITHER** 1(2)A/B CRD Pumps can be started, **THEN perform** QCOP 0300-19 (cross tie of Unit 1 and 2 CRD Pumps). ____

c. **IF** a CRD Pump is operating, **THEN**:

(1) **IF** at ANY TIME during the performance of this procedure a CRD pump trips, **THEN restart** the CRD Pump per QCOP 0300-01 **AND continue** in this step. ____

F.4.c (cont'd)

(2) **IF** at ANY TIME during performance of this procedure additional drive pressure is required, **THEN throttle** MO 1(2)-302-8, U-1(2) DRIVE PRESS VLV, **OR start** the second CRD pump per QCOP 0300-01. ____

(3) **IF** at ANY TIME during the performance of this procedure rods can **NOT** be driven due to insufficient drive water pressure, **THEN close** 1(2)-301-25, U-1(2) CRD CHARGING WTR SV, located in CRD Master Flow Control area, Reactor Building 1st Floor. ____

(4) **Place** RWM to BY position. ____

(5) **Select** a CRAM Rod that is **NOT** fully inserted **AND continuously drive** UNTIL fully inserted to position 00 using the EMERGENCY IN switch **OR** ROD MOVEMENT CONT switch. ____

(6) **IF** Control Rod inward motion is observed, **THEN continue inserting** CRAM Rods until all CRAM Rods are inserted. ____

(7) **Select** a center Control Rod that is **NOT** fully inserted **AND continuously drive** UNTIL fully inserted to position 00 using the EMERGENCY IN switch **OR** ROD MOVEMENT CONT switch. ____

(8) **IF** Control Rod inward motion is observed, **THEN continue inserting** Control Rods by spiraling out from the central core locations to peripheral locations UNTIL ALL Control Rods are inserted to **OR** beyond position 04. **Ensure** movable rods are **NOT** skipped as you work out from the center. ____

F.5. **Perform** scram reset **AND** SDV draining:

a. **Place** DISCH VOL HI WTR BYP keylock switch to BYPASS position. ____

F.5 (cont'd)

## CAUTION

**Unit 1 Only:** **IF** the Feedwater Level Control System is in AUTO, **THEN** resetting the Reactor Scram will return Feedwater Level Control to its tape setpoint value, possibly resulting in a sudden reactivity addition, Turbine trip or Reactor Feed Pump trip due to the increase in Feedwater flow and RPV level.

## NOTE

**Unit 2 Only:** Reset of Scram > 20 seconds after initiation will have **NO** effect on the FWLC System. Reset of Scram within 20 seconds will deactivate the feedwater flow scram profile if level > 15" and result in a smooth ramp of the level setpoint from actual water level to the master controller setting.

b. **IF** a RPV level transient is anticipated, **THEN control** the RPV level transient by adjusting the Feedwater Level Control level setpoint **OR** taking manual control of the Feedwater Regulating Valves. ____

c. **Reset** Reactor Scram. ____

F.5. (cont'd)

[redacted]

**CAUTION**

The next step bypasses ALL automatic RPS Scram signals!

[redacted]

d. **IF** Reactor Scram does **NOT** reset, **THEN jumper out** Reactor scram by installing jumpers, located in QGA Equipment Storage Drawer, as follows:

(1) **Install** jumpers in Panel 901(2)-15:

| | JUMPER No. | INIT |
|---|---|---|
| (a) Jumper between terminal board A, point 14 **AND** terminal board A, point 76. | #_____ | ____ |
| • Verification | | ____ |
| (b) Jumper between terminal board E, point 54 **AND** terminal board E, point 90. | #_____ | ____ |
| • Verification | | ____ |

(2) **Install** jumpers in Panel 901(2)-17:

| | | |
|---|---|---|
| (a) Jumper between terminal board A, point 76 **AND** terminal board A, point 86. | #_____ | ____ |
| • Verification | | ____ |
| (b) Jumper between terminal board E, point 54 **AND** terminal board E, point 90. | #_____ | ____ |
| • Verification | | ____ |

F.5.d. (cont'd)

## CAUTION

**Unit 1 Only:** **IF** the Feedwater Level Control System is in AUTO, **THEN** resetting the Reactor Scram will return Feedwater Level Control to its tape setpoint value, possibly resulting in a sudden reactivity addition, Turbine trip or Reactor Feed Pump trip due to the increase in Feedwater flow and RPV level.

**Unit 2 Only:** Reset of scram > 20 seconds after initiation will have **NO** effect on the FWLC System.

(3) **IF** a RPV level transient is anticipated, **THEN control** the RPV level transient by adjusting the Feedwater Level Control level setpoint **OR** taking manual control of the Feedwater Regulating Valves. ____

(4) **Reset** Reactor Scram. ____

## CAUTION

This next step prevents automatic operation of ARI valves by removing the ARI valve power supply.

e. **IF** scram valves are open, **THEN pull** the following fuses, located in Auxiliary Electrical Room, to allow automatic closure of ARI valves:

(1) At Panel 2201(2)-70A:

(a) Fuse F20A, second fuse from bottom of fuse block. ____

(b) Fuse F21A, bottom fuse of fuse block. ____

F.5.e. (cont'd)

(2) At Panel 2201(2)-70B:

(a) Fuse F20B, second fuse from bottom of fuse block. ____

(b) Fuse F21B, bottom fuse of fuse block. ____

F.6. **IF** control rods inserted as a result of the previous scram signal, **THEN**:

a. **IF** RPV pressure is less than 700 psig, **THEN open** 1(2)-301-25, U-1(2) CRD CHARGING WTR SV, to establish charging pressure. **Coordinate** opening of 1(2)-301-25 with NSO driving rods. ____

(1) **WHEN** the majority of CRD HCUs are charged, **THEN close** 1(2)-301-25, U-1(2) CRD CHARGING WTR SV. ____

b. **WHEN** SDV has drained as indicated by alarm 901(2)-5 A-14, CHANNEL A/B DISCH VOLUME HIGH LEVEL, reset, **THEN proceed**. ____

c. **WHEN** Reactor Scram is reset **AND** CRD scram pressure is available, **THEN initiate** a manual Reactor Scram. ____

(1) **IF** ALL Control Rods are **NOT** inserted to or beyond position 04 BUT Control Rods did move, **THEN repeat** steps F.5. **AND** F.6. ____

F.7. **Perform** Single Control Rod Scram Insertion:

a. **Place** DISCH VOL HI WTR BYP keylock switch to BYPASS position. ____

b. **IF** RPV pressure is < 700 psig, **THEN open** 1(2)-301-25, U-1(2) CRD CHARGING WTR SV, to establish charging pressure. **Coordinate** opening of 1(2)-301-25 with NSO driving rods. ____

(1) **WHEN** the majority of CRD HCUs are charged, **THEN close** 1(2)-301-25, U-1(2) CRD CHARGING WTR SV. ____

F.7. (cont'd)

c. **WHEN** SDV has drained as indicated by alarm 901(2)-5 A-14, CHANNEL A/B DISCH VOLUME HIGH LEVEL, reset, **THEN proceed**. ____

d. **WHEN** Reactor scram is reset **AND** CRD scram pressure is available **AND** SDV has drained, **THEN**:

(1) **Scram** a CRAM Control Rod that is **NOT** fully inserted by repositioning Control Rod scram toggle switch located on Panel 901(2)-16 to the **full up** position. ____

(2) **WHEN** Control Rod inward movement stops, **THEN return** scram switch to normal. ____

(3) **Continue** inserting CRAM Rods UNTIL ALL movable CRAM Rods are inserted to or beyond position 04. ____

(4) **WHEN** all movable CRAM Rods are inserted, **THEN scram** a center Control Rod that is **NOT** fully inserted by repositioning Control Rod scram toggle switch located on Panel 902(2)-16 to the **full up** position. ____

(5) **WHEN** Control Rod inward movement stops, **THEN return** scram switch to normal. ____

(6) **Continue** inserting Control Rods by spiraling out from the center core locations to peripheral locations UNTIL ALL Control Rods are inserted to or beyond position 04. **Ensure** movable rods are **NOT** skipped as you work out from the center. ____

F.8. **IF** Reactor Scram was jumpered **AND** jumpers are **NO** longer required, **THEN remove** jumpers:

a. **Remove** jumpers in Panel 901(2)-15:

| | JUMPER No. | INIT |
|---|---|---|
| (1) Jumper between terminal board A, point 14 **AND** terminal board A, point 76. | #_____ | ____ |
| (a) Verification | | ____ |
| (2) Jumper between terminal board E, point 54 **AND** terminal board E, point 90. | #_____ | ____ |
| (a) Verification | | ____ |

b. **Remove** jumpers in Panel 901(2)-17:

| | | |
|---|---|---|
| (1) Jumper between terminal board A, point 76 **AND** terminal board A, point 86. | #_____ | ____ |
| (a) Verification | | ____ |
| (2) Jumper between terminal board E, point 54 **AND** terminal board E, point 90. | #_____ | ____ |
| (a) Verification | | ____ |

F.9. **IF** fuses for scram solenoids were removed, **THEN verify** fuses re-installed:

a. At Panel 901(2)-15, Terminal Board "C":

| | |
|---|---|
| (1) 590-715A, F5. | ____ |
| (2) 590-715C, F6. | ____ |
| (3) 590-715E, F7. | ____ |
| (4) 590-715G, F8. | ____ |

F.9. (cont'd)

b. At Panel 901(2)-17 Terminal Board "C":

(1) 590-715B, F5. ____

(2) 590-715D, F6. ____

(3) 590-715F, F7. ____

(4) 590-715H, F8. ____

c. Verified by:_____ Date _____
SRO

F.10. **IF** ARI fuses were pulled **AND** are **NO** longer required to remain pulled, **THEN install** fuses in Auxiliary Electrical Room:

a. At Panel 2201(2)-70A, in upper left hand corner fuse block:

(1) Fuse F20A, second fuse from bottom of fuse block. ____

(2) Fuse F21A, bottom fuse of fuse block. ____

b. At Panel 2201(2)-70B, in upper left hand corner fuse block:

(1) Fuse F20B, second fuse from bottom of fuse block. ____

(2) Fuse F21B, bottom fuse of fuse block. ____

c. Verified by: _____ Date _____
SRO

F.11. **IF** scram air header was vented, **THEN open** one of the following valves:

a. 1(2)-301-147A, INST AIR TO SCRAM VLV PILOT AIR HDR A (FILT) INLET VLV. ____

b. 1(2)-301-147B, INST AIR TO SCRAM VLV PILOT AIR HDR B (FILT) INLET VLV. ____

c. Verified by: _____ Date_____
SRO

## G. ATTACHMENTS

G.1. Attachment A: Alternate Control Rod Insertion Flowchart.

## H. REFERENCES

### H.1. Technical Specifications:

None.

### H.2. P&IDs:

None.

### H.3. Drawings:

a. 4E-1465 (4E-2465), Schematic Diagram Reactor Protection System Channel "A" Scram & Auxiliary Trip Relays.

b. 4E-1466 Sh 1 (4E-2466 Sh 1), Schematic Diagram Reactor Protection System Channel "B" Scram & Auxiliary Trip Relays.

c. 4E-6577F (4E-7573F), Schematic Diagram ATWS Recirc Pump Trip System Div I & II Pt 6.

d. 4E-6578C (4E-7574C), Internal Wiring Diagram ATWS Recirc Pump Trip System Div I Pt 3.

e. 4E-6579C (4E-7575C), Internal Wiring Diagram ATWS Recirc Pump Trip System Div II Pt 3.

### H.4. Manuals:

None.

### H.5. Procedures:

a. QCOP 0300-01, CRD System Startup.

b. QCOP 0300-19, CRD Pump Cross-Tie Operation.

c. CC-AA-112, Temporary Modifications.

d. QCGP 2-3, Reactor Scram.

e. QGA 101, RPV Control (ATWS).

## H.6. UFSAR:

None.

## H.7. Commitments:

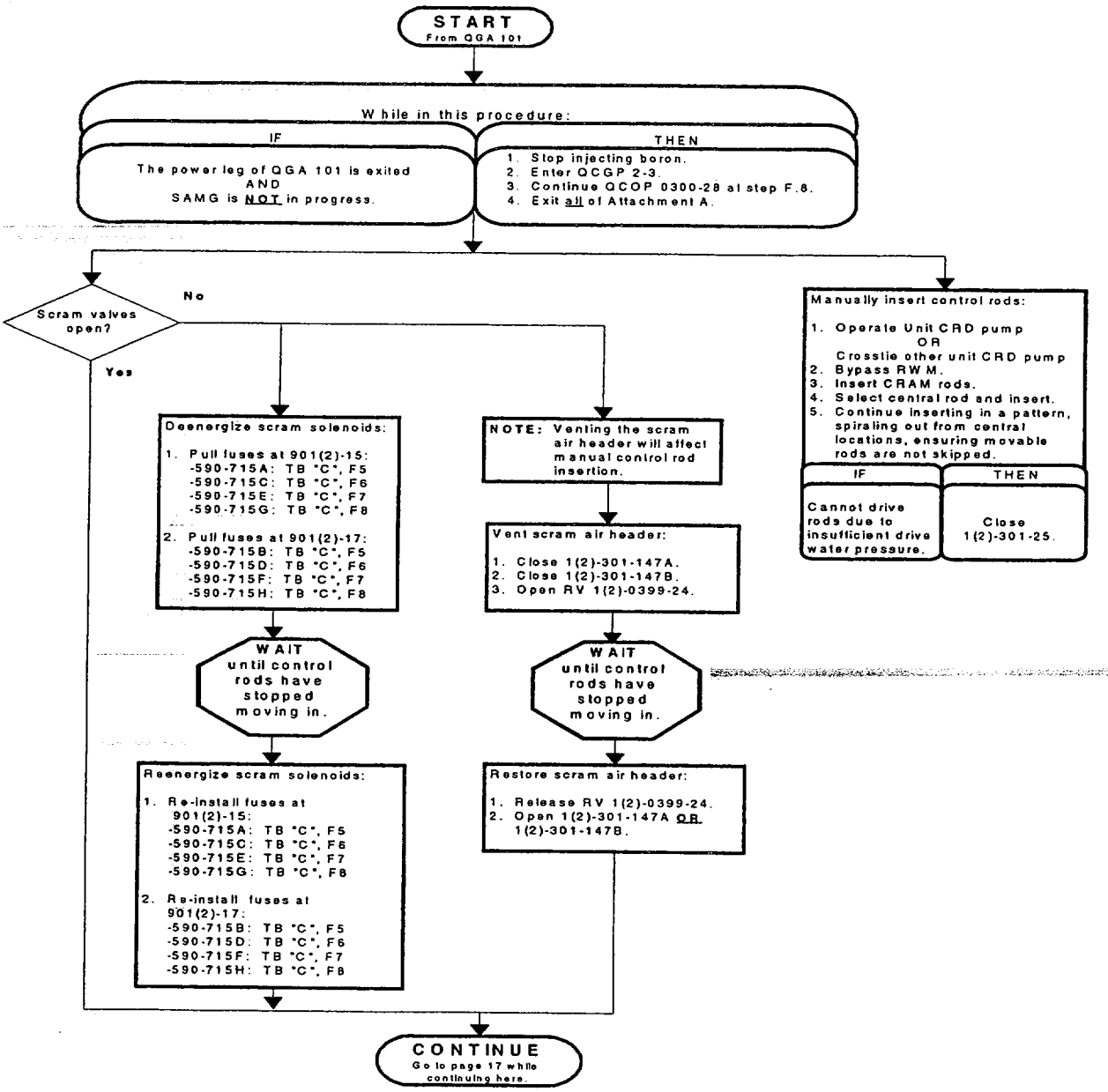
None.

## H.8. Others:

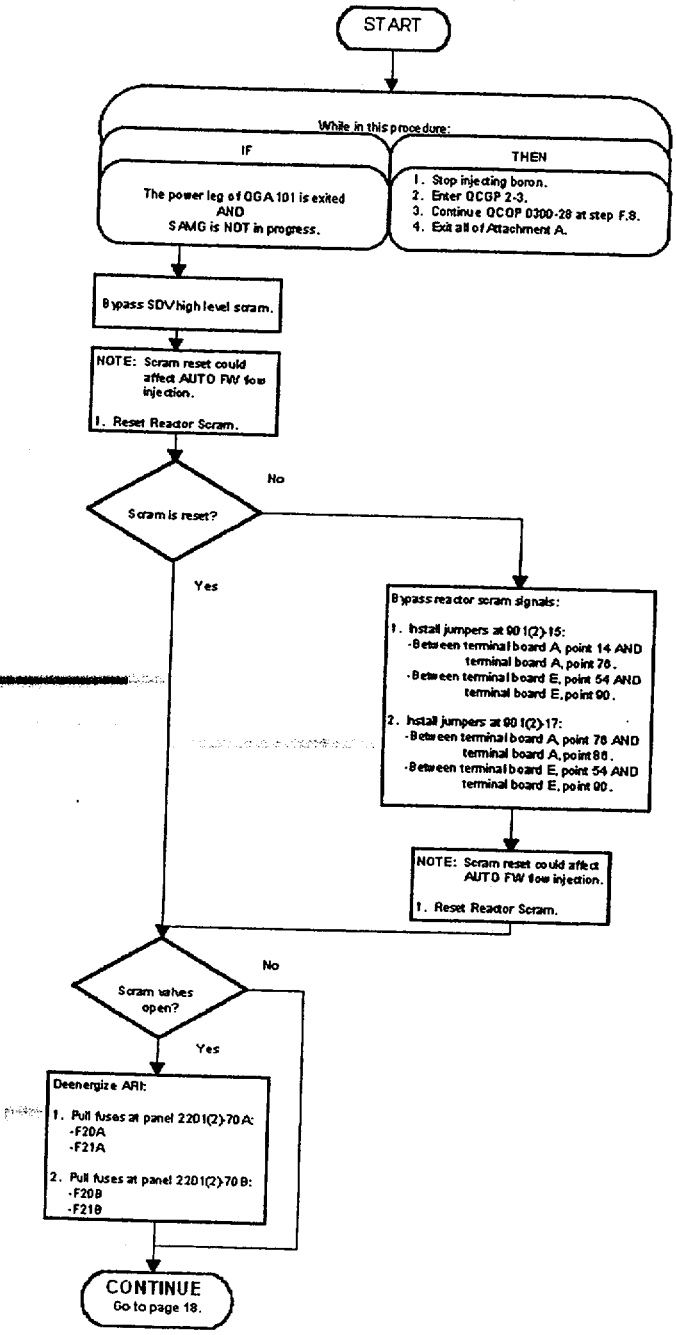
a. BWR Owners Group Emergency Procedure and Severe Accident Guideline.

b. QCPWG (Procedure Writers Guide) Vol 3.

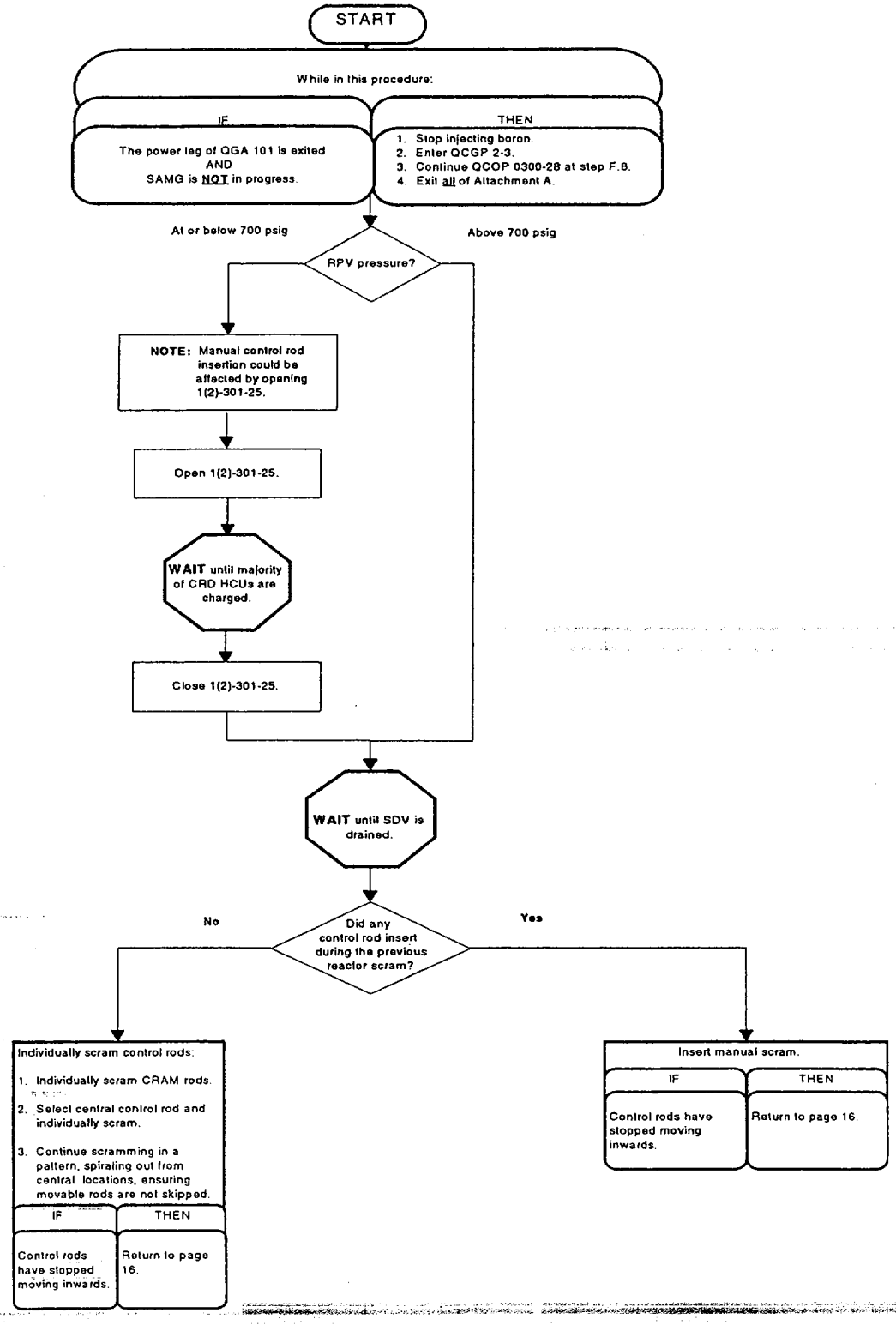
# ATTACHMENT A (Page 1 of 3)
# ALTERNATE CONTROL ROD INSERTION FLOWCHART



# ATTACHMENT A (Page 2 of 3)
# ALTERNATE CONTROL ROD INSERTION FLOWCHART



# ATTACHMENT A (Page 3 of 3)
# ALTERNATE CONTROL ROD INSERTION FLOWCHART



# Job Performance Measure (JPM)

## INITIAL CONDITIONS

(Student Copy)

- An ATWS has occurred on Unit 2 with reactor power currently at 35%.
- The Control Room is in QGA 101 and attempting to insert Control Rods.
- The Unit Supervisor has directed performance of QCOP 0300-28
- This JPM is not time critical

INITIATING CUE

Vent the U-2 scram air header to insert control rods in accordance with QCOP 0300-28 step F.3.

Exelon
Nuclear

# Nuclear Generation Group

# Job Performance Measure

**Perform the Aux Electric Room actions to start RHR in the Shutdown Cooling Mode in accordance with QCOP 1000-29.**

JPM Number: B.2.c.

Revision Number: 1

Date: 09/2002

| | | |
|---|---|---|
| **Developed By:** | Gary Thomas | 10/10/02 |
| | **Instructor** | **Date** |
| **Validated By:** | RC Moreland | 10-11-02 |
| | **SME or Instructor** | **Date** |
| **Review By:** | M Swigle | 10-11-02 |
| | **Operations Representative** | **Date** |

## Job Performance Measure (JPM)

### Revision Record (Summary)

Revision 0, The reason for this JPM is to demonstrate the ability to terminate one of the twenty most probable Core Damage Sequences.

This JPM is developed IAW guidelines established in NUREG 1021 Rev 8 ES-301 and Appendix C. This JPM meets the criteria of Category B.2. "Facility Walk Through," for RO/SRO candidates.

Revision 1 The JPM was revised to incorporate validation time and comments.

**Information For Evaluator's Use:**

All components are located in the Aux. Equipment Room. A key will need to be checked out at the Work Execution Center to access the cabinets in the Aux. Electric room

UNSAT requires written comments on respective step.

Denotes CRITICAL steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section at the bottom of the page. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

## Job Performance Measure (JPM)

### INITIAL CONDITIONS

- Unit 2 is entering a refueling outage.
- The Control Room has been evacuated due to toxic gas in the ventilation system.
- The Unit Supervisor has directed that the "A" Loop of Shutdown Cooling is to be placed in service from outside the Control Room.
- The Condensate Transfer system is available.
- Operators have been briefed and are standing by outside the MSIV room at phone extension 2431 with Radiation Protection support and all necessary equipment to perform step F.7.
- The reactor is shut down with reactor pressure at 37 psig.
- The plant is NOT using the QCARPs.
- The Shutdown Cooling suction header has been filled and vented.
- The RHR Service Water system is operating with discharge pressure of 275 psig.
- You have an Aux Electric Room key, and a jumper wire.
- This JPM is not time critical

**Initiating Cue:** **Perform the Aux Electric Room actions to start U-2"A"Loop RHR system in the Shutdown Cooling Mode in accordance with QCOP 1000-29 performing steps F.7.j.through F.7.l.**

**Provide examinee with:**

1. Copy of QCOP 1000-29 signed off through step F.7.i.
2. Unit 2 Auxiliary Electric Room Key

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

## Job Performance Measure (JPM)

JPM Start Time: _____

| | PERFORMANCE | OBJECTIVE STANDARDS | SAT UNSAT N/A |
|---|---|---|---|
| ***Evaluator Note: Provide candidate with marked up copy of procedure and a U-2 Aux. Electric room key.*** | | | |
| *F.7.j. Attachment B step 1.a. | Resets Group 2 isolation inboard logic per Attachment B. | Slides the ON/OFF switch for relay 595-115, located in the 902-40 to the ON position. (left) | [ ] [ ] [ ] |
| ***CUE: Indicate to the candidate that the ON/OFF switch for relay 595-115 is indicating ON.*** | | | |
| *F.7.j. Attachment B step 1.b. | Resets Group 2 isolation outboard logic per Attachment B. | Slides the ON/OFF switch for relay 595-116, located in the 902-41 to the ON position. | [ ] [ ] [ ] |
| ***CUE: Indicate to the candidate that the ON/OFF switch for relay 595-116 is indicating ON.*** | | | |
| *F.7.k. | Notifies operator to open the MO 2-1001-47 valve. | Using phone, notifies the operator standing by near the MO 2-1001-47 valve to open the valve | [ ] [ ] [ ] |
| ***CUE: Report as the NLO that the MO 2-1001-47 valve has been opened per step F.7.k. of QCOP 1000-29.*** | | | |
| ***NOTE to Evaluator: Once started closed by momentary installation of the jumper, the valve contactors seal in until the valve is full open (30 to 40 seconds).*** | | | |
| *F.7.l. | Open the MO 2-1001-50 SDC INBD ISOL LVL. | Momentarily places a jumper across terminals AA-12 and AA-13 in the 902-40 panel. | [ ] [ ] [ ] |
| F.7.l. | Makes notification of step completion. | Notifies Unit Supervisor or other shift personnel that step F.7.l. is complete. | [ ] [ ] [ ] |
| ***CUE: Acknowledge notification of step completion. If questioned regarding valve position, state that an operator verified the MO 2-1001-50 valve open.*** | | | |

*CRITICAL STEP

JPM Stop Time: _____

use of radio prohibited in sup elec. Rm.

# Job Performance Measure (JPM)

Operator's Name: _____

Job Title: RO ❑ SRO ❑

JPM Title: Perform the Aux Electric Room actions to start RHR in the Shutdown Cooling Mode in accordance with QCOP 1000-29.

JPM Number: B.2.c. Revision Number: 1

Task Number and Title SRN-1000-P34
Given a shutdown reactor plant with the control room evacuated, perform the aux. electric room actions to start RHR shutdown cooling operation in accordance with QCOP 1000-29

K/A Number and Importance:
**K/A: APE 295021 AA1.02** **RATING:** 3.5/3.5

**Suggested Testing Environment:** Plant

**Actual Testing Environment:** ❑ Simulator ❑ Plant
❑ Control Room

**Testing Method:** ❑ Simulate ❑ Perform **Faulted:** ❑ Yes ■ No **Alternate Path:** ❑ Yes ■ No

**Time Critical:** ❑ Yes ■ No

**Estimated Time to Complete:** 24 minutes **Actual Time Used:** _____ minutes

**References:** QCOP 1000-29, Rev. 11

## Job Performance Measure (JPM)

**EVALUATION SUMMARY:**

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____ (Print)

Evaluator's Signature: _____ Date: _____

# H. REFERENCES

## H.1. Technical Specifications:

a. TS 3.3.5.1, Emergency Core Cooling System (ECCS) Instrumentation.

b. TS 3.3.6.1, Primary Containment Isolation Instrumentation.

c. TS 3.4.7, Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown.

d. TS 3.4.8, Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown.

e. TS 3.4.9, RCS Pressure and Temperature (P/T) Limits.

f. TS 3.6.1.3, Primary Containment Isolation Valves (PCIVs).

g. TS 3.9.8, Residual Heat Removal (RHR) - High Water Level.

h. TS 3.9.9, Residual Heat Removal (RHR) - Low Water Level.

i. TS 3.5.1, ECCS - Operating.

j. TS 3.5.2, ECCS - Shutdown.

## H.2. P&IDs:

a. M-37 (M-79), Diagram of R.H.R.S. Piping.

b. M-39 Sh. 1 & 2 (M-81 Sh. 1& 2), Diagram of R.H.R.S. Piping.

## H.3. Drawings:

a. 4E-1438C (4E-2438C), Schematic Diagram RHR System Relay Logic - Div. I - Sh.3.

b. 4E-1438K Sh. 1 (4E-2438K Sh. 1), Schematic Diagram RHR System Motor Operated Valves Div I.

c. 4E-1507 (4E-2507), Schematic Diagram P.C.I. System RHR/Reactor Water Cleanup Systems.

d. 4E-1420B Sh 1 (4E-2420A Sh 3), Schematic Diagram Recirculation Pump 1B(2A) MO Valves.

e. 4E-1501D (4E-1501D), Schematic Diagram P.C.I. System Switch Development.

H.3. (cont'd)

f. 4E-1508A Sh 3 (4E-2508A Sh 3), Schematic Diagram P.C.I. System MO Valves 1(2)-1001-47 and 50.

## H.4. Manuals:

None.

## H.5. Procedures:

a. QCOA 1000-02, Loss of Shutdown Cooling.

b. QCOP 1000-02, RHR System Preparation for Standby Operation.

c. QCOP 1000-03, Shutdown Cooling Suction Header Fill and Vent.

d. QOP 6500-10, Local Control of 4160 and 480 Volt Motor Operated Circuit Breaker.

e. QOP 9900-50, Print One Value and Limits (OD-50).

## H.6. UFSAR:

a. Section 6.2.4, Residual Heat Removal (RHR) System.

b. Section 7.4.2, Shutdown Outside the Control Room.

## H.7. Commitments:

None.

## H.8. Others:

a. NRC Bulletin 88-04 Potential Safety Related Pump Loss.

b. OPEX 401-87-002 (Inadvertent draining of Reactor vessel).

c. OPEX 83-56 (Inadvertent draining of Reactor Vessel to the Suppression Pool).

d. OPEX 998-401-87-00200 (Inadvertent draining of Reactor Vessel to the Suppression Pool at BWRs).

e. Eenigenburg Letter to R. Bax dated 10-28-85, Operational Guidelines for Motor Operated Valves.

f. QCPWG (Procedure Writers Guide), Volume 3.

F.8. (cont'd)

d. **IF** Unit Supervisor determines SDC is required to be placed back into operation, **THEN**:

(1) **Direct** operator at Bus 13(23)-1 **AND** 14(24)-1 to set up for local 4 KV breaker operation per QOP 6500-10 for the RHR Pump(s) to be started:

(a) 1(2)A/B RHR Pump at Bus 13(23)-1. ____

(b) 1(2)C/D RHR Pump at Bus 14(24)-1. ____

## CAUTION

The next two steps should be performed in rapid secession to provide a flow path so as **NOT** to dead head the RHR Pump.

e. **Close** RHR Pump Breaker at Bus 13-1/14-1(23-1/24-1). ____

f. **Immediately open** MO 1(2)-1001-29A/B, INBD LPCI INJ VLV from local Control Station (located Torus area outside RHR Pump Room) to establish a RHR discharge pressure of 150 to 200 psig. ____

g. **Throttle** MO 1(2)-1001-16A/B from local Control Station (located in RHR Pump room) to establish a cooldown rate < 100°F/hr. (H.1.e) ____

F.9. **IF** RHR Shutdown Cooling will **NOT** be required for operation, **THEN**:

a. **Establish** communications between the RHR Pump breaker at Bus 13(23)-1 or 14(24)-1, the local Control Station for MO 1(2)-1001-29A/B, **AND** RHR Pump discharge pressure instrument. ____

b. **Close** MO 1(2)-1001-29A/B from local Control Station. ____

c. **WHEN** RHR Pump discharge pressure starts to increase, **THEN open** RHR pump breaker at Bus 13(23)-1 or 14(24)-1 per QOP 6500-10. ____

F.9. (cont'd)

d. **Close** breaker for MO 1(2)-1001-43A and 43B **OR** MO 1(2)-1001-43C and 43D, at MCC 18(28)-1B or MCC 19(29)-4. ____

e. **Close** MO 1(2)-1001-43A and 43B **OR** MO 1(2)-1001-43C and 43D. ____

f. **Close** MO 1(2)-1001-47. ____

g. **Close** MO 1(2)-1001-50, by momentarily placing jumpers across terminals AA-14 and AA-15 in 901(2)-40 Panel (in Aux Electric Room). ____

h. **Close** breaker for MO 1(2)-1001-7A and 7B **OR** MO 1(2)-1001-7C and 7D, at MCC 18(28)-1B or MCC 19(29)-4. ____

i. **Open** MO 1(2)-1001-7A and 7B **OR** MO 1(2)-1001-7C and 7D. ____

j. **Close** breaker for MO 1(2)-1001-18A/B, RHR MIN FLOW VLV at MCC 18-1A-1/19-1-1 (MCC 28-1A-1/29-1-1). ____

(1) **Open** MO 1(2)-1001-18A/B. ____

k. **IF** the opposite RHR Loop is lined up such that MO 1(2)-1001-19A/B, may be opened, **THEN open** MO 1(2)-1001-19A/B. ____

l. **Open** MO 1(2)-1001-16A/B. ____

m. **Open** breaker for running RHR Service Water pump(s) at Bus 13(23) or 14(24) per QOP 6500-10. ____

n. **Close** MO 1(2)-1001-5A/B. ____

o. **Perform** Attachment C. ____

## G. ATTACHMENTS

G.1. Attachment A, Resetting Group 2 Isolation for MO 1(2)-1001-29A/B from the Aux Electric Room.

G.2. Attachment B, Resetting Group 2 Isolation from the Aux Electric Room.

G.3. Attachment C, RHR Shutdown Cooling Restoration Verification Sheet.

## Job Performance Measure (JPM)

### INITIAL CONDITIONS

(Student Copy)

- Unit 2 is entering a refueling outage.
- The Control Room has been evacuated due to toxic gas in the ventilation system.
- The Unit Supervisor has directed that the "A" Loop of Shutdown Cooling is to be placed in service from outside the Control Room.
- The Condensate Transfer system is available.
- Operators have been briefed and are standing by outside the MSIV room at phone extension 2431 with Radiation Protection support and all necessary equipment to perform step F.7.
- The reactor is shut down with reactor pressure at 37 psig.
- The plant is NOT using the QCARPs.
- The Shutdown Cooling suction header has been filled and vented.
- The RHR Service Water system is operating with discharge pressure of 275 psig.
- You have an Aux Electric Room key, and a jumper wire.
- This JPM is not time critical

**Initiating Cue:** **Perform the Aux Electric Room actions to start U-2"A"Loop RHR system in the Shutdown Cooling Mode in accordance with QCOP 1000-29 performing steps F.7.j.through F.7.l.**

F.7. (cont'd)

g. **Open** breaker for MO 1(2)-1001-43A and 43B **OR** MO 1(2)-1001-43C and 43D, **THEN release** local Control Station pushbutton. MS

h. **Close** MO 1(2)-1001-19A/B, from the local Control Station, (located in RHR Pump Room) **AND hold** close pushbutton until next step is completed. MS

i. **Open** breaker for MO 1(2)-1001-19A/B, at MCC 18-1B/19-4 (MCC 28-1B/29-4), **THEN release** close pushbutton. MS

(j) **Reset** Group 2 isolation per Attachment B. ✓

k. **Open** MO 1(2)-1001-47 from local Control Station (located outside the MSIV Room) (near Recirculation MG Set oil cooler). CM

**NOTE**

Contactors closed during performance of the next step, will seal-in once depressed until valve fully opens in 30 to 40 seconds.

l. **Open** MO 1(2)-1001-50 SDC INBD ISOL VLV, by momentarily placing jumpers across terminals AA-12 and AA-13 in 901(2)-40 Panel (located in Aux Electric Room). ✓

m. **Verify open** MO 1(2)-1001-16A/B, RHR HX BYP VLV by observing the indicating lights on the local Control Station (located in RHR Pump Room). ____

n. **Verify** bearing **AND** seal water available to desired RHR Pump. ____

o. **Close** MO 1(2)-1001-28A/B from the local Control Station. ____

p. **Open** MO 1(2)-1001-29A/B from local Control Station (located Torus area outside RHR Pump Room). ____

F.7. (cont'd)

q. **Verify closed** MO 1(2)-1001-23A/B from local Control Station (located 1st floor RB outside Drywell Personnel Access RB el 623 behind Instrument Rack 2201-6). ____

r. **Verify closed** MO 1(2)-1001-34A/B from local Control Station. ____

s. **Direct** operator at Bus 13(23)-1 **AND** 14(24)-1 to set up for local 4 KV breaker operation per QOP 6500-10 for the RHR Pump(s) to be started:

(1) 1(2)A/B RHR Pump at Bus 13(23)-1. ____

(2) 1(2)C/D RHR Pump at Bus 14(24)-1. ____

## CAUTION

The next two steps should be performed in rapid secession to provide a flow path so as **NOT** to dead head the RHR Pump.

t. **Close** RHR Pump Breaker at Bus 13-1/14-1(23-1/24-1). ____

u. **Immediately throttle open** MO 1(2)-1001-28A/B, from local Control Station, (located Torus area outside RHR Pump Room) to establish a RHR discharge pressure of 150 to 200 psig. ____

v. **Throttle** MO 1(2)-1001-16A/B, from local Control Station, (located in RHR Pump Room) to establish a Reactor cooldown rate < 100°F per hour. (H.1.e) ____

F.8. **WHEN** Unit Supervisor determines Shutdown Cooling is **NO** longer required, **THEN**:

a. **Establish** communications between the RHR Pump breaker at Bus 13(23)-1 or 14(24)-1, the local Control Station for MO 1(2)-1001-29A/B, and RHR Pump discharge pressure instrument. ____

b. **Close** MO 1(2)-1001-29A/B from the local Control Station. ____

c. **WHEN** RHR Pump discharge pressure starts to increase, **THEN trip** RHR pump breaker from the bus. ____

## ATTACHMENT A (Page 1 of 1)

# RESETTING GROUP 2 ISOLATION FOR MO 1(2)-1001-29A/B FROM THE AUX ELECTRIC ROOM

1. To reset GROUP 2 isolation for MO 1(2)-1001-29A/B perform the following at 901(2)-32/33 Panel:

   a. **Remove** cover from relay 10A-K63A/B. ____

   b. With use of a non-conducting device (such as a small fuse puller) **gently pull** the movable contact finger for contact 2-8 away from the fixed contact. ____

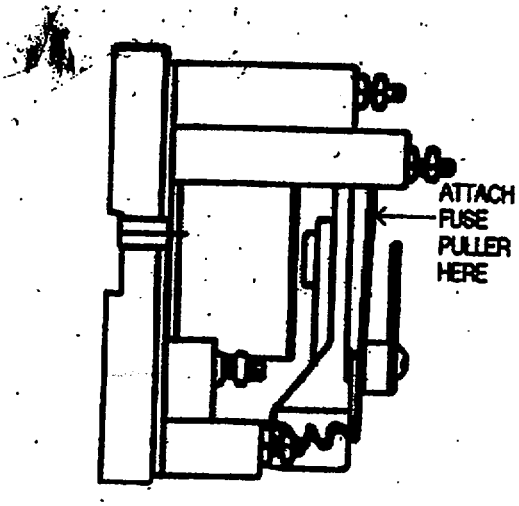
   c. **Verify** relay resets. ____

   d. **Release** the contact fingers. ____

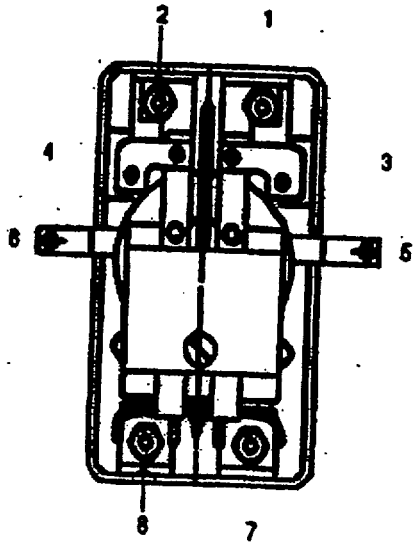
**NOTE**

The relay will stay reset if the Group Two isolation signal is reset.

   e. **Verify** relay stays reset. ____




SIDE VIEW




FRONT VIEW

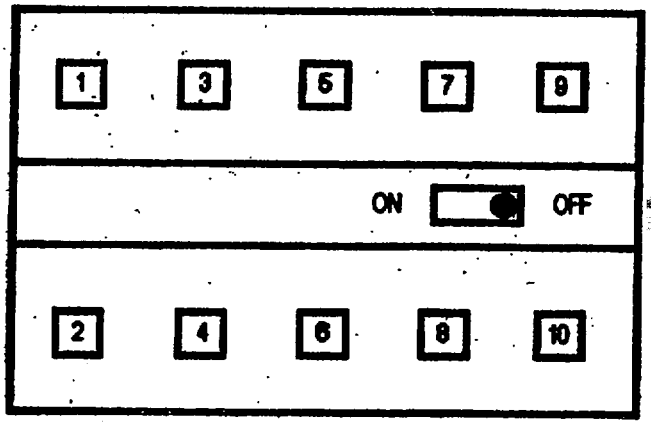
## ATTACHMENT B (Page 1 of 1)

# RESETTING GROUP 2 ISOLATION FROM THE AUX ELECTRIC ROOM

1. To reset GROUP 2 isolation perform the following:

   a. For <u>inboard</u> logic, **place** ON/OFF switch for relay 595-115, (located in 901(2)-40 Panel) to ON position.

   b. For <u>outboard</u> logic, **place** ON/OFF switch for relay 595-116, (located in 901(2)-41 Panel) to ON position.




RELAY 595-115 / 595-116

## ATTACHMENT C (Page 1 of 3)

# RHR SHUTDOWN COOLING RESTORATION VERIFICATION SHEET

1. **Verify** the following breakers are **racked in OR closed**:

   a. 1(2)A RHR Service Water Pump at Bus 13 cubicle 12 (23 cubicle 5). _____

   b. 1(2)B RHR Service Water Pump at Bus 13 cubicle 9 (23 cubicle 9). _____

   c. 1(2)C RHR Service Water Pump at Bus 14 cubicle 10 (24 cubicle 2). _____

   d. 1(2)D RHR Service Water Pump at Bus 14 cubicle 14 (24 cubicle 6). _____

   e. 1(2)A RHR Pump at Bus 13-1 cubicle 9 (Bus 23-1 cubicle 4). _____

   f. 1(2)B RHR Pump at Bus 13-1 cubicle 5 (Bus 23-1 cubicle 6). _____

   g. 1(2)C RHR Pump at Bus 14-1 cubicle 8 (Bus 24-1 cubicle 5). _____

   h. 1(2)D RHR Pump at Bus 14-1 cubicle 4 (Bus 24-1 cubicle 7). _____

   i. MCC 18(28)-1B:

      (1) MO 1(2)-1001-7A, RHR PUMP SUCTION VALVE. _____

      (2) MO 1(2)-1001-7B, RHR PUMP SUCTION VALVE. _____

      (3) MO 1(2)-1001-43A, RHR SHUTDOWN CLG SUCT VALVE. _____

      (4) MO 1(2)-1001-43B, RHR SHUTDOWN CLG SUCT VALVE. _____

      (5) MO 1(2)-1001-19A, RHR HDR CROSS-TIE VALVE. _____

   j. MCC 19(29)-4:

      (1) MO 1(2)-1001-7C, RHR PUMP SUCTION VALVE. _____

      (2) MO 1(2)-1001-7D, RHR PUMP SUCTION VALVE. _____

      (3) MO 1(2)-1001-43C, RHR SHUTDOWN CLG SUCT VALVE. _____

## ATTACHMENT C (Page 2 of 3)

## RHR SHUTDOWN COOLING RESTORATION VERIFICATION SHEET

(4) MO 1(2)-1001-43D, RHR SHUTDOWN CLG SUCT VALVE. _____

(5) MO 1(2)-1001-19B, RHR HDR CROSS-TIE VALVE. _____

2. **Verify** the following jumpers **removed**:

a. Across terminals BB-58 and BB-59 in 901(2)-46 Panel (located in Aux Electric Room). _____

b. Across terminals BB-58 and BB-59 in 901(2)-47 Panel (located in Aux Electric Room). _____

c. Across terminals AA-12 and AA-13 in 901(2)-40 Panel (located in Aux Electric Room). _____

d. Across terminals AA-14 and AA-15 in 901(2)-40 Panel (located in Aux Electric Room). _____

3. **Verify** the following valve positions:

a. MO 1(2)-1001-5A/B, RHR HX SW DISCH VLV **closed**. _____

b. MO 1(2)-1001-7A, TORUS TO RHR PMP ISOL VLV **open**. _____

c. MO 1(2)-1001-7B, TORUS TO RHR PMP ISOL VLV **open**. _____

d. MO 1(2)-1001-7C, TORUS TO RHR PMP ISOL VLV **open**. _____

e. MO 1(2)-1001-7D, TORUS TO RHR PMP ISOL VLV **open**. _____

f. MO 1(2)-1001-16A/B, RHR HX BYP VLV **open**. _____

g. MO 1(2)-1001-18A/B, RHR MIN FLOW BYP **open**. _____

h. MO 1(2)-1001-19A/B, SOUTH XTIE VLV **open**. _____

i. MO 1(2)-1001-28A/B, OUTBD LPCI INJ VLV **open**. _____

j. MO 1(2)-1001-29A/B, INBD LPCI INJ VLV **closed**. _____

## ATTACHMENT C (Page 3 of 3)

# RHR SHUTDOWN COOLING RESTORATION VERIFICATION SHEET

k. MO 1(2)-1001-43A, SDC OR FUEL POOL SUCT VLV **closed**. _____

l. MO 1(2)-1001-43B, SDC OR FUEL POOL SUCT VLV **closed**. _____

m. MO 1(2)-1001-43C, SDC OR FUEL POOL SUCT VLV **closed**. _____

n. MO 1(2)-1001-43D, SDC OR FUEL POOL SUCT VLV **closed**. _____

o. MO 1(2)-1001-47, SDC OUTBD ISOL VLV **closed**. _____

p. MO 1(2)-1001-50 SDC INBD ISOL VLV **closed**. _____

4. **WHEN** Control Room is accessible again, **THEN perform** QCOP 1000-02. _____

_____ _____
Verified By Date

## NOTE

SDC permissive interlock will clear at 118.5 psig Reactor pressure. This can be read at Instrument Rack 2201(2)-5, 2nd floor RB **OR** in TSC computer points CX09 and CX10.

F.3. **Verify** SDC permissive interlock **cleared** by observing relay 595-117 in 901(2)-40 Panel is **energized**, toggle is in ON position, (located in Aux Electric Room).

F.4. **IF** on UNIT 1, **THEN fill** and **vent** Shutdown Cooling suction header:

NA

a. **Open** 1-3399-108, COND TRANSFER TO U-1 ECCS SV, (located second floor RB north wall). ____

b. **Open** 1-3399-137, COND TRANSFER TO U-1 ECCS PCV BYP VLV (located 1st floor RB north wall). ____

c. **Open** 1-1001-134, COND TRANSFER FILL LINE TO U-1 SHUTDOWN CLG HDR SV, (located 1st floor RB north wall by CRD Modules). ____

d. **Reset** Group II isolation at 901-5 Panel. ____

e. **Verify** breaker for MO 1-1001-47, SDC OUTBD ISOL VLV at 250V DC MCC 1A, CUB. J01 **Open**. ____

f. **Close** disconnect switch for MO 1-1001-47, at 1-1001-47-DS (located in the "D" Heater Bay, ground floor elevation, on the west face of H line at 17 line). ____

g. **Close** breaker for MO 1-1001-47 at 250VDC MCC 1A, Cub J01. ____

h. **Open** 1-1001-47. ____

i. **Connect** a hose downstream of 1-1001-48, SHUTDOWN DLG SUCT HDR PRESS TEST INBD SV and 1-1001-49, SHUTDOWN CLG SUCT HDR PRESS TEST OUTBD SV (located in MSIV room) per Step E.1. ____

j. **Open** 1-1001-48. ____

F.4. (cont'd)

NA

k. **Slowly open** 1-1001-49 valve to vent system. ____

l. **WHEN** a steady stream of water is observed, **THEN close** 1-1001-49. ____

m. **Close** 1-1001-48 **AND remove** hose. ____

n. **Close** 1-1001-134. ____

o. **Close** 1-3399-108, COND TRANSFER TO U-1 ECCS SV. ____

p. **Close** 1-3399-137. ____

F.5. **IF** on UNIT 2, **THEN fill** and **vent** the SDC suction header:

a. **Open** 2-3399-108, COND TRANSFER TO U-2 ECCS SV, (located second floor RB south wall). MS

b. **Open** 2-1001-134, COND TRANSFER FILL LINE TO U-2 SHUTDOWN CLG HDR SV, (located 1st floor RB south wall by CRD Modules). MS

c. **Reset** Group II isolation on 902-5 Panel per Attachment B. MS

d. **Verify** breaker K02, K03 for MO 2-1001-47, SDC OUTBD ISOL VLV at 250V DC MCC 2A **open**. MS

e. **Close** disconnect switch for MO 2-1001-47 at 2-1001-47-DS (located near Recirculation MG Set Oil Coolers). MS

f. **Close** breaker K02, K03 for MO 2-1001-47, SDC OUTBD ISOL VLV at 250V MCC 2A. MS

g. **Open** MO 2-1001-47, SDC OUTBD ISOL VLV from local Control Station, (located near Recirculation MG Set oil cooler. MS

h. **Open** 2-1001-156A, U-2 SHUTDOWN CLG SUCT HDR INBD VENT VLV. MS

i. **Open** 2-1001-156B, U-2 SHUTDOWN CLG SUCT HDR OUTBD VENT VL (located Steam Tunnel south wall by steps) until a steady flow of water is observed, **THEN close** valve. MS

E.6. **IF** Shutdown Cooling is lost, **THEN perform** QCOA 1000-02.

E.7. **IF** unexplained loss of coolant inventory occurs, **THEN close** MO 1(2)-1001-47, SDC OUTBD ISOL VLV, MO 1(2)-1001-50, SDC INBD ISOL VLV, **AND** MO 1(2)-1001-29A/B, INBD LPCI INJ VLV. (H.8.b, H.8.c, H.8.d)

E.8. On a Group II isolation the following RHR valves will auto close: (H.1.b, H.3.a)

a. MO 1(2)-1001-20, RHR TO RW DISCH VLV.

b. MO 1(2)-1001-21, RHR TO RW DISCH VLV.

c. MO 1(2)-1001-47, SDC OUTBD ISOL VLV.

d. MO 1(2)-1001-50, SDC INBD ISOL VLV.

**NOTE**

**WHEN** MO 1(2)-1001-29A/B, INBD LPCI INJ VLV is in the Shutdown Cooling mode it will isolate on an Group II isolation signal.

e. MO 1(2)-1001-29A/B, INBD LPCI INJ VLV **WHEN** BOTH MO 1(2)-1001-47, SDC OUTBD ISOL VLV **AND** MO 1(2)-1001-50, SDC INBD ISOL VLV are open.

E.9. Group II isolation is initiated by any of the follow signals: (H.1.b)

a. Reactor low water level.

b. Drywell high pressure.

c. Drywell high radiation.

E.10. Motor Operated Valves Guidelines: (H.8.e)

a. A maximum of five starts within a one minute period, followed by a 30 minutes cooling off time.

b. The valve is operable during the cooling off period.

c. **WHEN** throttle valves are required to adjust flow or pressure, **THEN** it may be necessary to wait a few seconds to abide by this guideline.

E.11. **WHEN** a change of radiological conditions in RHR Room, "D" Heater Bay, Steam Tunnel and/or Torus area may have occurred, **THEN** **contact** Radiation Protection prior to entry **AND** **IF** time permits, **THEN** a Radiation Technician should accompany the operator.

E.12. RHR and RHR Service Water motor start limitations:

a. Two starts in succession with windings at ambient temperature **OR** during an accident. Windings are considered to be at ambient temperature if the pump has been off for ≥ 45 minutes.

b. Once with the windings at rated temperature, 60°C (140°F) during non-accident conditions. Windings are considered to be at rated temperature if the pump has been running for ≥ 15 minutes.

## F. PROCEDURE

F.1. **IF** a Group 2 Isolation occurs, **THEN**, as needed, **reset** by performing Attachment A **AND** Attachment B.

F.2. **IF** B Reactor Recirculation pump trips, **THEN**, as needed, **close** MO 1(2)-202-5B by performing the following:

a. Install a jumper at one of the following locations:

(1) Across terminals BB-58 and BB-59 in 901(2)-46 Panel (located in Aux Electric Room).

(2) Across terminal BB-58 and BB-59 in 901(2)-47 Panel (located in Aux Electric Room).

b. **WHEN** MO 1(2)-202-5B is **closed** as indicated on MCC 18/19-5 (MCC 28/29-5), **THEN** **remove** jumper.

Verified By: N/A / N/A
Date

F.5. (cont'd)

j. **Close** 2-1001-156A. MS

k. **Close** MO 2-1001-47 from local Control Station. MS

l. **Close** 2-1001-134. MS

m. **Close** 2-3399-108. MS

F.6. **Place** RHR Service Water System in operation:

a. **Direct** operator at Bus 13(23) **AND** 14(24) to set up for local 4 KV breaker operation per QOP 6500-10 for the RHR Service Water Pump(s) to be started:

(1) 1(2)A RHR Service Water Pump at Bus 13(23) cubicle 12(5). MS

(2) 1(2)B RHR Service Water Pump at Bus 13(23) cubicle 9(9). MS

(3) 1(2)C RHR Service Water Pump at Bus 14(24) cubicle 10(2). MS

(4) 1(2)D RHR Service Water Pump at Bus 14(24) cubicle 14(6). MS

b. **Open** 65% (26 sec open signal) MO 1(2)-1001-5A/B, RHR HX SW DISCH VLV from local Control Station, (located in RHR Pump Room). MS

c. **Close** RHR Service Water Pump breaker at Bus 13/14(23/24). MS

(1) **Monitor** RHR Service Water Pump discharge pressure as indicated on local PI 1(2)-1001-77A/B/C/D. MS

(2) **Adjust** MO 1(2)-1001-5A/B, RHR HX SW DISCH VLV to establish discharge pressure of 250 psig to 300 psig. MS

F.7. **Place** RHR in SDC:

a. From Local Control Station **outside** the RHR room, **verify closed** MO 1(2)-1001-18A/B, RHR MIN FLOW BYP (north room for "A" valves, south room for "B" valves. MS

F.7. (cont'd)

b. **Open** breaker for MO 1(2)-1001-18A/B, RHR MIN FLOW VLV at following: MS

(1) MO 1(2)-1001-18A at MCC 18(28)-1A-1, C3. MS

(2) MO 1(2)-1001-18B at MCC 19(29)-1-1, B1. MS

c. **Establish** communications between the RHR Pump Room and the following MCCs:

(1) MCC 18(28)-1B: MS

(a) MO 1(2)-1001-7A.

(b) MO 1(2)-1001-7B.

(c) MO 1(2)-1001-43A.

(d) MO 1(2)-1001-43B.

(e) MO 1(2)-1001-19A.

(2) MCC 19(29)-4: MS

(a) MO 1(2)-1001-7C.

(b) MO 1(2)-1001-7D.

(c) MO 1(2)-1001-43C.

(d) MO 1(2)-1001-43D.

(e) MO 1(2)-1001-19B.

d. **Close** MO 1(2)-1001-7A and 7B **OR** MO 1(2)-1001-7C and 7D, from local Control Station, (located in RHR Pump Room) **AND hold** pushbutton until the next step is completed. MS

e. **Open** breaker for MO 1(2)-1001-7A and 7B **OR** MO 1(2)-1001-7C and 7D, **THEN release** local Control Station pushbutton. MS

f. **Open** MO 1(2)-1001-43A and 43B **OR** MO 1(2)-1001-43C and 43D, from local Control Station, (location in RHR Pump Room) **AND hold** pushbutton until the next step is completed. MS

Candidate Copy



# SHUTDOWN COOLING STARTUP AND OPERATION FROM OUTSIDE THE CONTROL ROOM

## A. PURPOSE

The purpose of this procedure is to provide the steps necessary to start up and operate RHR in the Shutdown Cooling (SDC) mode from outside the Control Room.

## B. DISCUSSION

None.

## C. PREREQUISITES

C.1. Condensate Transfer System available. MS

C.2. Keys for local valve control stations. MS

C.3. Reactor Pressure < 100 psig. MS

C.4. Plant **NOT** using QARPs. MS

## D. PRECAUTIONS

D.1. The Shutdown Cooling Group 2 isolation interlocks shall remain fully operational during the performance of this procedure.

D.2. **Maintain** RHR Service Water pressure at least 15 psig to 20 psig higher than RHR pressure.

D.3. **IF** MO 1(2)-1001-7A & 7B **OR** MO 1(2)-1001-7C & 7D, TORUS TO RHR PMP ISOL VLV are closed for any reason; except during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) cut-in permissive pressure in MODE 3, **IF** capable of being manually realigned and **NOT** otherwise inoperable, **THEN** the associated LPCI subsystem is inoperable. (H.1.i)

D.4. **WHEN** in SDC, **THEN** do **NOT** open MO 1(2)-1001-34A/B, TORUS TEST OR SPRAY VLV **AND** MO 1(2)-1001-36A/B, TORUS H2O TEST VLV (to prevent draining water from Reactor vessel to the suppression chamber). (H.8.b, c, d)

D.5. **WHEN** in SDC, **THEN** do **NOT** open MO 1(2)-1001-34A/B, TORUS TEST OR SPRAY VLV **AND** MO 1(2)-1001-37A/B, TORUS SPRAY SHUTOFF VLV (to prevent draining water from Reactor vessel to the Torus). (H.8.b, c, d)

D.6. To prevent draining the Reactor Vessel to CCST, 1-1001-41(2-1001-40), U-1(2) RHR CCST SUCT VLV **AND** 1(2)-1001-42A/B/C/D, 1(2)A/B/C/D RHR PMP CCST SUCT VLV must be locked closed. (H.8.b, c, d)

D.7. During conditions with Reactor Vessel isolated, vessel water level will vary with coolant temperature. Experience has shown this relationship to be approximately a 1-inch change in water level for a 4°F change in coolant temperature. (H.1.e)

D.8. During the performance of this procedure MO 1(2)-1001-18A/B will be de-energized in the closed position and there will be **NO** minimum flow protection for the RHR Pumps. Therefore minimize the time the RHR Pumps are running without a flow path.

## E. LIMITATIONS AND ACTIONS

E.1. Venting the U1 SDC system will be accomplished by installing a section of hose, approximately 20 feet or longer (to reach nearest drain), downstream of the 1-1001-48 and 49 valves (in the MSIV room) **AND** looping the hose a minimum of 5 feet above the top of the piping. The 5 foot loop is required as the piping in the Drywell is at a higher elevation.

E.2. In order to fill and vent the SDC headers, MO 1(2)-1001-47, SDC SUCT HDR DOWNSTREAM SV, must be open. This will require Reactor pressure be < 100 psig. This verification is required prior to electrically connecting the valve motor armature due to 'hot short' concerns.

E.3. Computer point values may be obtained from the Technical Support Center (TSC) in accordance with QOP 9900-50.

E.4. **Maintain** Reactor Coolant cooldown rate of less than 100°F/hr. **Monitor** coolant temperature with computer point CX23, if RWCU is in operation **OR** RHR inlet temperature computer points CX83, for A RHR Loop **OR** CX84, for B RHR Loop. (H.1.e)

E.5. **IF** the B Reactor Recirculation Pump is off **OR** trips when Shutdown Cooling is discharging to the B loop, **THEN close** MO 1(2)-202-5B, PMP DISCH VLV (Recirc Pump) per this procedure.