

|   |                        |   |
|---|------------------------|---|
| Facility: <u>Nine Mile Point # 1</u>      |                        | Date of Examination: <u>07/24/2000</u>  |
| Examination Level (circle one): <b>RO</b> |                        | Operating Test Number: <u>Cat A Test 1</u>  |
| Administrative Topic/Subject Description  |                        | Describe method of evaluation:<br>1. ONE Administrative JPM, OR<br>2. TWO Administrative Questions  |
| A.1                                       | Procedures             | 2.1.20<br><br>Q.1. As an operator you have been assigned to the Reactor Building for performance of N1-ST-Q6A, CONTAINMENT SPRAY SYSTEM LOOP #111 QUARTERLY OPERABILITY TEST. What are the administrative requirements to ensure the steps are completed in the specified order? Include how a signed copy is maintained so that it can be reviewed by the SSS?<br><br>Ref. NIP-PRO-01, Section 3 |
|   |                        | 2.1.20<br><br>Q.2. During the performance of N1-ST-Q6A, CONTAINMENT SPRAY SYSTEM LOOP #111 QUARTERLY OPERABILITY TEST, step 8.2.10 containment spray raw water flow is determined to be $155.3 \times 10^4$ lbm/hr. What actions are required?<br><br>Ref. NIP-PRO-01, Section 3.4  |
|   | Parameter Verification | 2.1.7, 2.1.10, 2.1.19, 2.1.33, 2.2.22<br><br>Q.1. During a startup the Electric Pressure Regulator (EPR) fails and is removed from service. Reactor power is 42%. What is the new limiting value of MCPR?<br><br>References: T.S. 2.1 and COLR.<br><i>LER: 1-99-06</i>  |
|   |                        | 2.1.7, 2.1.10, 2.1.19, 2.1.33, 2.2.22<br><br>Q.2. If the value for CMFLPD is 1.006 on a P3 (3D Monicore Edit) what thermal limit is being exceeded?<br><br>References: T.S. 2.1.2, COLR<br><i>LER 1-99-03</i>   |

|     |                      |   |
|-----|----------------------|---|
| A.2 | Tagging              | <p>2.2.13</p> <p>Q.1. During a refueling outage a markup will be issued on the Hydrogen Seal Oil system for cleaning the tank. Other work will also be performed under this markup, including:</p> <ul style="list-style-type: none"> <li>• Replacing the differential pressure controller</li> <li>• Rebuilding the main and emergency seal oil pumps</li> </ul> <p>What are your responsibilities as an independent verifier to ensure adequate personnel protection is provided when verifying this markup during the development and review process?</p> <p>References: GAP-OPS-02, Section 3.2</p> <hr/> <p>2.2.13</p> <p>Q.2 During the application of a markup for electrical work on safety-related equipment, the job is <u>cancelled</u> while the tags are being hung.</p> <ul style="list-style-type: none"> <li>• Four (4) of the ten (10) tags on the markup have been hung on repositioned components but have NOT been independently verified.</li> <li>• The other six (6) tags have NOT been hung and the designated components have NOT been repositioned.</li> </ul> <p>The SSS has determined that it is not appropriate to hang the remaining six tags because of a safety concern.</p> <p>As the Markup Controller, what actions are necessary to void this markup?</p> <p>Reference: GAP-OPS-02, Section 3.12, 3.13</p> |
| A.3 | Radiation Control    | <p>2.3.1, 2.3.4</p> <p>Q.1. Use the attached Supplemental Radiation Survey Log Sheet for the Reactor Building 261' RWCU Corridor and RWCU Heat Exchanger Room to answer this question. State the radiological posting(s) required at the entrance to the area <b>and</b> identify on the map the information that supports the posting(s).</p> <p>Reference: S-RAP-RPP-0103, 3.2.6, 3.2.8, 4.4, 4.7</p> <hr/> <p>2.3.1, 2.3.10</p> <p>Q.2. You are required to enter the drywell to check freeze seals; this is your first drywell entry during this outage. Radiation Protection directs you to sign on and use RWP 507, DW VLV REPACKS, FREEZE SEALS AND ASSOCIATED WORK. The RWP is attached.</p> <p>Determine the requirements and restrictions that apply to you prior to and during the drywell entry.</p> <p>References: GAP-RPP-02</p>  |
| A.4 | Emergency Procedures | <p>JPM: Medical Emergency (CSO Actions) – Contaminated injured worker requiring transport to Oswego hospital – in accordance with EPIP-EPP-04. K/A 2.4.39 (3.3)</p>   |

p 2 A1

| <b>Nine Mile Point 1</b>                                  |                 |
|---|-----------------|
| <b>Category "A" - Examination Outline Cross Reference</b> |                 |
| Operating Test Number                                     | Cat "A" Test: 1 |
| Examination Level   | RO              |
| Administrative Topic                                      | A.1             |
| Subject Description:                                      | Procedures      |
| Question Number:  | 1               |

**Question:**

As an operator, you have been assigned to the Reactor Building for performance of N1-ST-Q6A, CONTAINMENT SPRAY SYSTEM LOOP #11 QUARTERLY OPERABILITY TEST.

What are the administrative requirements to ensure the steps are completed in the specified order? Include how a signed copy is maintained so that it can be reviewed by the SSS.

**Answer:**

- An individual shall be designated at the brief as the **Procedure Controller**.
- The Procedure Controller (control room) shall possess the "Controlled Working Copy."
- The operator in the Reactor Building shall have a copy of the "Controlled Working Copy" being used by the Procedure Controller.

*Note to the examiner: Per NIP-PRO-01, 3.3.9.b, remote personnel may possess a copy of the Controlled Working Copy, Master Copy, or Satellite Master Copy. Per the Note following NIP-PRO-01, 3.3.3.c, Since the procedure requires sign-offs, the Master Copy or Satellite Master Copy may NOT be used by the operator in the Reactor Building.*

- Procedure Controller is responsible for ensuring the procedural steps are performed in the correct sequence and each step is documented correctly. For steps outside the control room, the procedure controller directs step performance and indicates on the "Controlled Working Copy" in the control room step completion using a check mark adjacent to the step.
- The Reactor Building operator reports to the control room and signs the steps he/she performed on the "Controlled Working Copy" used by the procedure Controller.

|   |                 |
|---|-----------------|
| <b>Nine Mile Point 1</b>                                  |                 |
| <b>Category "A" - Examination Outline Cross Reference</b> |                 |
| Operating Test Number                                     | Cat "A" Test: 1 |
| Examination Level   | RO              |
| Administrative Topic                                      | A.1             |
| Subject Description:                                      | Procedures      |
| Question Number:  | 1               |

|                                |
|--------------------------------|
| <b>Technical Reference(s):</b> |
| Ref. NIP-PRO-01, Section 3     |

|               |                    |
|---------------|--------------------|
| <b>K/A #:</b> | <b>Importance:</b> |
| 2.1.20        |                    |

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|------------------|
| <b>Comments:</b> |
|                  |

NOT DO BECAUSE  
 MULT DEPARTMENTS  
 THAT PROC PERFORMED  
 BY MULTIPLE PERSONNEL  
 IN REMOTE LOCATIONS  
 ⇒ PROCURE CONTRACT

### 3.2.5 (Cont)

- b. Designation of a new RPO should be communicated to the Procedures Group by:
  1. Initiating a "Database Change Only" procedure control form per NIP-PRO-02 or NIP-PRO-03, as appropriate; OR,
  2. If numerous procedures are affected (such as all maintenance I&C procedures), documenting RPO transfer and affected procedure type(s) on an internal memorandum.

### 3.3 Use of Procedures

(C1) 3.3.1 Procedures *shall be physically present* and implemented as written for extensive, complex, or multi-step activities where reliance on memory is not sufficient. Except as permitted in 3.3.2, this includes, but is not limited to, Technical Procedures used to perform:

- Surveillance and special tests
- Emergency Operating Procedures (EOPs)
- Operations activities for startup, shutdown, power changes
- Activities that require independent verification

3.3.2 Procedures shall be implemented as written *but need NOT be physically present* while performing frequently repeated, routine activities or those that are committed to memory including:

- Recognition of EOP entry conditions
- Skill-of-the-Craft tasks based on personnel training and qualifications
- Activities implemented through Administrative Procedures
- Performing those EOP support procedures or specific actions within EOPs determined appropriate by the operator qualification and training program
- Immediate actions identified in Special Operating Procedures
- Checking or observing equipment
- Drawing samples
- Lubricating equipment
- Radiation surveying

3.3.3 When a Technical Procedure is required to be physically present, a "Controlled Working Copy" of the procedure shall be used.

- a. Controlled Working Copies shall be obtained per NIP-DOC-01.

3.3.3 (Cont)

- b. For data taking through observation, a Controlled Working Copy of a data sheet alone may be used provided the data sheet supports independent use.
- c. If a Controlled Working Copy becomes contaminated or unusable, data may be transferred to a "clean" copy.

**NOTE** If implementation does not require sign-offs, a Master or Satellite Master copy may be used in lieu of a Controlled Working Copy.

3.3.4 Before performing a procedure, users should review for familiarization, expected results, and potential concerns.

- a. Pre-shift briefings and, if necessary, periodic briefings thereafter should be conducted for involved personnel.
- b. Users should be aware of expected results of actions taken during procedural performance and verify that expected responses occur.

**NOTE:** Procedural inaccuracies do not relieve the user of the responsibility to maintain safe plant operation.

3.3.5 If a procedure contains SSS approval for release, SSS release may be granted prior to completion of prerequisites, however, the user shall ensure prerequisites are completed before performing the "Procedure" section.

- a. Preapproved work is subject to the scheduling controls of GAP-PSH-01.
- b. Completion of Prerequisites should not be delayed beyond the approved schedule for the work without SSS renotification.

3.3.6 Portions of procedures may be used for, but not limited to, the following situations:

- a. To satisfy post-maintenance testing (PMT) requirements
- b. To perform partial surveillance tests as a retest
- c. To perform a specific troubleshooting activity
- d. When the procedure includes multiple surveillance activities and not all activities require performance
- e. When emergency events addressed by Emergency Plan Implementing Procedures are not actually experienced

3.3.7 When only a portion of a technical procedure is performed, the Controlled Working Copy shall include as a minimum:

- a. The Purpose through Prerequisites sections
- b. Procedure subsections necessary to perform the activity
- c. The Return to Normal, Acceptance Criteria, and Records Review and Disposition Sections, as applicable

**NOTE:** For data taking *through observation*, a Controlled Working Copy of a data sheet alone may be used provided the data sheet supports independent use.

3.3.8 When procedure steps include sign-offs or checklists, users shall initial or check appropriately upon completion of each such step.

3.3.9 When performing an activity involving multiple users in separate locations, procedures may be performed using a "Procedure Controller":

- a. The Procedure Controller shall possess and maintain the Controlled Working Copy.
- b. Remote personnel should possess a copy of the Controlled Working Copy, Master copy, or Satellite Master Copy.
- c. The Procedure Controller is responsible to ensure that procedure steps are performed in correct sequence by directing remote personnel as required.
- d. The Procedure Controller shall indicate step completion in the Controlled Working Copy. Sign-offs may be completed by the Procedure Controller or may be obtained from remote personnel before procedure closeout.

3.3.10 Procedure entries are controlled by NIP-RMG-01 for legibility, ink requirements, and corrections.

3.3.11 When a procedure activity is interrupted or use is discontinuous, users shall ensure equipment is left in a safe, stable condition.

- a. Procedures should not remain open for long periods.
- b. If a lengthy interruption is expected (>2 weeks), the procedure should be closed with appropriate sections completed and new copy initiated when work is resumed.

- 3.3.12 If a technical procedure is inactivated during use, the RPO shall ensure the activity is re-evaluated and shall:
- a. Accept completed results based on a comparison with any revised or replacement documents; OR
  - b. Ensure affected activities are re-performed using the revised or replacement document
- 3.3.13 If a procedure requires implementation of a reference document, such references shall be controlled as follows:
- a. Other procedures, drawings, vendor manuals, and other documents normally controlled by Document Control shall be controlled per NIP-DOC-01.
  - b. Documents not normally controlled by Document Control shall be used as referenced in applicable procedure.
- 3.3.14 Forms shall be controlled by the parent procedure. Users shall verify forms are current per the latest revision of the parent procedure including any approved changes.

(C1) 3.4 Adherence to Procedures

- 3.4.1 While on site, personnel shall adhere to requirements of applicable Generation Administrative Procedures (GAPs), Nuclear Interface Procedures (NIPs), and procedures for emergency response regardless of the individual's reporting organization.
- 3.4.2 When a procedure is required, users shall perform steps in sequence unless:
- a. The procedure specifically permits deviation from sequence
  - b. The activity is administrative and sequence is not dictated by the Administrative Procedure
  - c. Performing Annunciator Response Procedure steps which may be performed in any order, or not completed, as appropriate
- 3.4.3 When a procedure cannot be performed safely, cannot or should not be performed as written, is technically incorrect, or unexpected results or conditions occur, users shall:
- a. Stop the activity being performed at the earliest point so as to prevent endangering personnel or equipment.
  - b. Notify supervision of the deficiency or condition.
  - c. As applicable, notify the Station Shift Supervisor of unexpected results or conditions.

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| <b>Nine Mile Point 1</b>                                  |                 |
| <b>Category "A" - Examination Outline Cross Reference</b> |                 |
| Operating Test Number                                     | Cat "A" Test: 1 |
| Examination Level   | RO              |
| Administrative Topic                                      | A.1             |
| Subject Description:                                      | Procedures      |
| Question Number:  | 2               |

**Question:**

During the performance of N1-ST-Q6A, CONTAINMENT SPRAY SYSTEM LOOP 111 QUARTERLY OPERABILITY TEST, Step 8.2.10, the containment spray raw water flow is determined to be  $155.3 \times 10^4$  lbm/hr.

What actions are required?

**Answer:**

*Per step 8.2.10*, break the seal and attempt to raise flow (throttle 93-21, RATE SET – 111 CONT SPRAY RAW WATER OUTLET) by performing the following:

- Unlock and remove the tamper seal on 93-21.
- Throttle open 93-21, to establish CSRW Flow at  $156.8$  to  $163.2 \times 10^4$  lbm/hr.

**EXAMINER INTERACTION:** When the candidate attempts to throttle flow inform the candidate that "**Flow cannot be raised above  $155.3 \times 10^4$  Lbm/hr.**"

- Stop the surveillance
- Notify the CRS, SSS that the procedure cannot be performed as written
- Determine that the system is already in a safe condition

**Technical Reference(s):**  
 NIP-PRO-01, Section 3.4  
 N1-ST-Q6A

|               |                    |
|---------------|--------------------|
| <b>K/A #:</b> | <b>Importance:</b> |
| 2.1.20        |                    |

**Comments:**

- 3.3.12 If a technical procedure is inactivated during use, the RPO shall ensure the activity is re-evaluated and shall:
- a. Accept completed results based on a comparison with any revised or replacement documents; OR
  - b. Ensure affected activities are re-performed using the revised or replacement document
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- a. The procedure specifically permits deviation from sequence
  - b. The activity is administrative and sequence is not dictated by the Administrative Procedure
  - c. Performing Annunciator Response Procedure steps which may be performed in any order, or not completed, as appropriate
- 3.4.3 When a procedure cannot be performed safely, cannot or should not be performed as written, is technically incorrect, or unexpected results or conditions occur, users shall:
- a. Stop the activity being performed at the earliest point so as to prevent endangering personnel or equipment.
  - b. Notify supervision of the deficiency or condition.
  - c. As applicable, notify the Station Shift Supervisor of unexpected results or conditions.

3.4.3 (Cont)

- d. As appropriate, obtain approval of a procedure revision or procedure change to correct the deficiency prior to resuming the activity.

3.4.4 When a procedure is found to have inconsistencies that do NOT lead to confusion or do NOT prevent it from being performed correctly (such as typographical or spelling errors), users should:

- a. Make a note of the deficiency
- b. Continue with the activity
- c. Initiate a procedure change after completion of the activity.

3.4.5 Operations Department actions are controlled by GAP-OPS-01 for situations that are not addressed by existing procedures, may result in personnel injury or damage to the station, OR require actions to protect the health and safety of the public.

3.5 Independent Verification

3.5.1 Independent verification is required for the alignment of safety related systems and components, for maintenance and testing activities, to ensure:

- a. The correct system or component is removed from service, and
- b. Systems or components returned to service are properly aligned before being declared operational.

3.5.2 Independent verification is required for the application and restoration of temporary alterations to systems/components, that affect nuclear safety, to ensure proper installation and removal.

3.5.3 Independent verification may be waived when proper alignment can be demonstrated through functional testing or when significant radiation exposure would result.

3.5.4 Personnel performing independent verification shall:

- a. Be knowledgeable of the action or condition being verified AND be qualified to perform the action being verified.
- b. Maintain the integrity of independent verification by minimizing interaction between the performer and verifier. Physical separation is not required.
- c. Verify the action or condition against the written procedure requirement.

NIAGARA MOHAWK POWER CORPORATION  
NINE MILE POINT NUCLEAR STATION UNIT 1  
SURVEILLANCE TEST PROCEDURE

N1-ST-Q6A

REVISION 06

CONTAINMENT SPRAY SYSTEM LOOP 111 QUARTERLY OPERABILITY TEST

TECHNICAL SPECIFICATION REQUIRED

Approved by:  
R. G. Smith

\_\_\_\_\_  
Manager Operations - Unit 1

\_\_\_\_\_  
Date

THIS IS A FULL REVISION

Effective Date: \_\_\_\_\_

LIST OF EFFECTIVE PAGES

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| i               | . . . . .50806,50966,<br>51491,51857,52787,53894,<br>54131,54448,55176 | 24              | . . . . .50403             |                 |                   |
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| 7               | . . . . .52787   | 32              | . . . . .                  |                 |                   |
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| 17              | . . . . .54448   |                 |                            |                 |                   |
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1.0 PURPOSE

- 1.1 To perform Containment System Isolation Valves operability testing in accordance with Plant Technical Specifications and the NMP1 Pump and Valve Inservice Testing Program Plan.
- 1.2 To verify satisfactory operation of valve position limit switches (LSC,LSO) and solenoid operated valves (SOVs) in accordance with the requirements of the Equipment Qualification (EQ) Program.
- 1.3 This procedure provides the instructions necessary to perform Containment Spray and Raw Water System pump and valve operability testing in accordance with Technical Specifications and NMP1 Pump and Valve Inservice Testing Program Plan.
- 1.4 To provide instructions necessary to perform Environmental Qualification (EQ) testing in accordance with the NMP1 Equipment Qualification Program.
- 1.5 Provides instructions to allow lowering of Torus Level should it be necessary coincident with performance of the surveillance test.

2.0 TECHNICAL SPECIFICATIONS

2.1 Surveillance Requirements

- 2.1.1 4.2.6b, In-service Testing
- 2.1.2 4.3.7a, Containment Spray Pump Testing
- 2.1.3 4.3.7c, Raw Water Cooling Pump Testing
- 2.1.4 4.3.7d, Surveillance with Inoperable Components
- 2.1.5 4.3.4b, Primary Containment Isolation Valves

2.2 Limiting Conditions for Operability (LCO)

- 2.2.1 3.2.6b, In-service Testing
- 2.2.2 3.3.7.b & c, Containment Spray System
- 2.2.3 3.3.4, Primary Containment Isolation Valves
- 2.2.4 NIP-DES-04, List of Controlled Lists (Valve Stroke Times)

2.3 Frequency

This procedure shall be performed quarterly to satisfy surveillance requirements during all periods when the Containment Spray System is required to be operable.

- 3.0 REFERENCES AND COMMITMENTS
- 3.1 Licensee Documentation
  - 3.1.1 Technical Specification 6.14, Systems Integrity
  - 3.1.2 DER 1-92-4195 NMP1 Motor Current Evaluation
  - 3.1.3 DER 1-98-2407, System Leakage not Recorded
- 3.2 Standards, Regulations, and Codes
  - 3.2.1 NUREG 0737, Clarification of TMI Action Plan Requirements, Item III.D.1.1
  - 3.2.2 NUREG 0578, Three Mile Island 2, Lessons Learned Task Force Status Report and Short Term Recommendations
  - 3.2.3 ASME Section XI, 1989 Edition.
- 3.3 Policies, Programs and Procedures
  - 3.3.1 N1-PM-Q9, Procedure for Operations Lubrication
  - 3.3.2 N1-MAP-IIT-0102 Analysis and Trending of IST Test Results
  - 3.3.3 N1-ITP-02, Vibration Measurement
  - 3.3.4 N1-OP-14, Containment Spray System
  - 3.3.5 N1-ITP-03, Check Valve Non-Intrusive Testing
  - 3.3.6 N1-ITP-08, Check Valve Non-Intrusive Testing Using Liberty Technologies Quickcheck II
- 3.4 Technical Information
  - 3.4.1 C-18012-C, Shts 1 and 2, Reactor Containment Spray System P&ID
  - 3.4.2 C-27072-C, Torus Modification Mode of Drain Conn. & Addition of Valves P&ID
  - 3.4.3 MDC-11, Pump Curves and Acceptance Criteria
  - 3.4.4 NMPC Calculation SO-TORUS-M009 NMP1 Pool Heatup Analysis
  - 3.4.5 EQRM 16
  - 3.4.6 EQRM 8G
  - 3.4.7 EQRM 4B
  - 3.4.8 EQRM 8F

3.5 Supplemental References

- 3.5.1 NMP1 Pump and Valve Inservice Testing Program
- 3.5.2 Letter dated December 31, 1978 from Donald P. Dise to Harold R. Denton on the subject of NUREG 0578.
- 3.5.3 Safety Evaluation 91-023 Heat Removal Capability of the Containment Spray System based on the Design Basis Reconstitution LOCA Suppression Chamber Temperature Response Analysis
- 3.5.4 Safety Evaluation 89-13 Containment Spray Post DBA LOCA Appendix J Water Seal
- 3.5.5 NP-4916, R1, EPRI Lubrication Guide
- 3.5.6 Letter dated January 29, 1996 from P. Bartolini to P. Politzi on subject of Raw Water Pump Stuffing Box Greasing M96-0017
- 3.5.7 DER 1-98-3460, Containment Spray System LCO Clarity

3.6 Commitments

| <u>Sequence Number</u> | <u>NCTS Number</u> | <u>Description</u>  |
|------------------------|--------------------|---|
| <EQ>                   | 003460-01          | Revise procedures to incorporate EQRM requirements.                             |
| C2                     | DER 1-94-0660      | Engineering to evaluate Containment Spray leakage per Safety Evaluation 94-036. |
| C3                     | 503965-04          | Deleted   |

4.0 GENERAL TEST METHODS

This procedure is divided into two (2) subsections, each of which may be performed independently of each other to facilitate Post-Maintenance Testing and to minimize shifting of plant equipment. Steps within these subsections shall be performed in order with the exception of data taking steps in subsection 8.2 - those steps that take data after the 5 minute waiting period may be performed in the order convenient for the data takers.

4.1 Containment System IV Testing

- 4.1.1 Full exercise testing of power operated valves consists of operating the valve to the position(s) required to fulfill its safety function.

- 4.1.2 Cycling of valves consists of full exercising a valve from its normal position to the opposite position and returning it to its normal position again by full exercising as indicated by observing indirect evidence that signals the change of disk position.
- 4.1.3 Stroke times of power operated valves are measured during full exercise testing in the direction specified in the NMP1 Pump and Valve Inservice Testing Program Plan. Stroke times are measured to at least a tenth of a second for stroke times of 10 seconds or less. Full stroke times of longer than 10 seconds are measured to at least the nearest second. Full stroke time is that interval from the initiation of the actuating signal to the end of the actuating cycle indication.
- 4.1.4 The operation of valve position limit switches will be verified during valve cycling by checking for satisfactory valve position indication (VPI) in the control room. Limit switches that are tested for EQ purposes are listed in Attachment 5, EQ Component Matrix.
- 4.1.5 The operation of SOVs will be demonstrated by the ability to cycle the associated valve. SOVs that are tested for EQ purposes are listed in Attachment 5, EQ Component Matrix.
- 4.2 Containment Spray System Pump Testing
- 4.2.1 Containment Spray Pump and Containment Spray Raw Water Pump testing is performed by starting the applicable pump combination, running the pumps for a minimum of 5 minutes under stabilized conditions, and measuring the following parameters.
- a. Pump inlet pressure
  - b. Pump discharge pressure
  - c. Flow rate
  - d. Motor vibration amplitudes
  - e. Motor running current
- 4.2.2 Inservice Testing (IST) test personnel shall perform all procedure steps designated IST, as applicable.
- 4.2.3 ASME Section XI requires gauge fluctuations to be less than  $\pm 2\%$  of the observed reading. Hydraulic instrumentation may be dampened by using gauge snubbers or by throttling small valves in instrument lines.
- 4.3 Containment Spray System Check Valve Testing
- 4.3.1 Check valve full exercise testing in the forward flow direction consists of passing the required design flow rate through the valve.
- 4.3.2 Check valve partial exercise testing in the forward flow direction consists of passing the minimum required pump test flowrate through the valve.

- 4.3.3 Check valve reverse flow testing will be completed in this procedure using the difference between the discharge pressure prior to starting the pump and the discharge pressure after the pump is shut off.
- 4.3.4 Check valve full exercise testing in the forward flow direction is performed by verifying that the check valve disk is exercised to full open position as indicated by Non-Intrusive Test equipment. This testing is only required to be performed once every Refuel.

4.4 Quantification of System Leakage

A walkdown of the Containment Spray System is performed while the Containment Spray Pumps are running to quantify the total leakage from the Containment Spray System.

4.5 Post-Maintenance Testing

This procedure may be used for Post-Maintenance Testing or verification of operability for any equipment covered by this procedure. When used for this purpose, Sections 1.0 through 6.0 and the applicable subsections/steps of Section 7.0 through 10.0 shall be performed. All IST tests applicable to a particular component are required to be performed to verify operability.

4.6 EQ Testing

This procedure implements EQRM 16 requirements to check containment spray pump motor oil levels, bearing temperatures and vibration levels.

4.7 Use of Not Applicable (N/A) or Not Required (N/R) For Procedure Steps

- 4.7.1 N/A or N/R may be used where the procedure specifically allows it; or,
- 4.7.2 N/A or N/R may be used to eliminate procedure steps when only a portion of the procedure is performed, such as Post-Maintenance Testing, retest to verify questionable data, or other testing to be specified in Section 7.0. Document the reason for using N/A or N/R in Section 10.
- 4.8 Independent verifications may be performed after the completion of Section 8.0, except those marked by an asterisk (\*). Those marked by an asterisk must be performed in the order they appear in the test.

5.0 TEST EQUIPMENT

| 5.1 | <u>Portable Test Instrumentation</u> | <u>Range</u> | <u>Required Accuracy</u> |
|-----|--------------------------------------|--------------|--------------------------|
| •   | Vibration Spectrum Analyzer(2)       | N/A          | ±5%                      |
| •   | Hand-held stopwatch                  | N/A          | N/A                      |
| •   | Thermocouple Digital Thermometer     | N/A          | N/A                      |

5.1 (Cont)

|   | <u>Portable Test Instrumentation</u>                         | <u>Range</u> | <u>Required Accuracy</u> |
|---|--|--------------|--------------------------|
| • | Stroboscope  | N/A          | N/A                      |
| • | MOVATS Non-Intrusive Test System ("Checkmate")               |              |                          |
| • | Liberty Technologies Quickcheck II Non-Intrusive Test System |              |                          |

6.0 PRECAUTIONS AND LIMITATIONS

- 6.1 Failure to use calibrated test equipment of the specified accuracy may result in invalidating the test data obtained.
- 6.2 Failure to notify the Station Shift Supervisor (SSS) immediately whenever a procedural step cannot be completed as stated, or if any other problem develops during the test, may result in invalidating procedure and tests results.
- 6.3 Containment Spray Raw Water Pumps and the associated Containment Spray Pumps should be run simultaneously to maintain a lower differential pressure between the heat exchanger shell and tubes. The Containment Spray Raw Water Pumps should always be started first.
- 6.4 Failure to exercise caution to prevent the temperature probe from contacting any energized or moving parts when measuring stator housing temperatures may cause personnel endangerment and equipment damage.
- 6.5 Applicable Radiological precautions shall be observed, Radiation Protection shall be contacted for guidance, as required.
- 6.6 All ALARA practices shall be observed to minimize personnel exposure and spread of contamination.
- 6.7 Failure of the Operations Department to analyze Inservice Testing test data during the same shift, could result in a violation of ASME Section XI requirements.
- 6.8 During testing of CS Raw Water 111 Intertie Valve 93-71, failure to allow it's corresponding CS 111 HX Outlet Valve 93-25 to reach full open or closed prior to giving a second control switch signal to these valves, may cause both valves to be either open or closed simultaneously, due to the difference in their stroke times. If this condition occurs, taking the control switch to open for either of the valves will properly re-align them to one open, and one closed.

7.0 PREREQUISITES

Initials/Date

7.1 Verify this procedure to be the latest revision.

\_\_\_\_\_/\_\_\_\_\_

7.2 Specify the reason for test performance.

(\_\_ ) Routine Surveillance, including IST

(\_\_ ) Post-Maintenance Testing, WO Number \_\_\_\_\_

(\_\_ ) Inoperable Component

(\_\_ ) Other (specify) \_\_\_\_\_

\_\_\_\_\_/\_\_\_\_\_

Initials/Date

7.3 Notify Inservice Testing (IST) Department prior to the start of testing. \_\_\_\_\_ / \_\_\_\_\_

\_\_\_\_\_  
Person Notified                      /                      /  
Date                                      Time

7.4 Determine if Non-Intrusive testing of 80-06, Containment Spray Pump 111 Discharge Check Valve is required. (Once every Refuel)

Non-Intrusive testing required. ( ) YES ( ) NO \_\_\_\_\_ / \_\_\_\_\_

7.5 Personnel responsible for the performance of this test have read and thoroughly understand its contents prior to test commencement. \_\_\_\_\_ / \_\_\_\_\_

7.6 Ensure the following permanent plant instrumentation is calibrated, and reading normally for no-flow condition:

| <u>Instrument Name</u> | <u>Instrument ID Number</u> | <u>Cal. Due Date</u> |               |
|------------------------|-----------------------------|----------------------|---------------|
| • CTNSP 111 Pressure   | PI-80-47A                   | _____                | _____ / _____ |
| • CTNSP 111 Flow       | FI-80-49B                   | _____                | _____ / _____ |
| • CTNRW 111 Flow       | FI-93-30B                   | _____                | _____ / _____ |
| • Torus Level          | LI-58-05A                   | _____                | _____ / _____ |
| • Torus Level          | LI-58-06A                   | _____                | _____ / _____ |
| • Lake Level           | PI-73-32                    | _____                | _____ / _____ |
| • CTNRW 111 Press      | PI-93-95                    | _____                | _____ / _____ |
| • CTNRW Heat Ex Press  | PI-93-47                    | _____                | _____ / _____ |
| • CTNSP Heat Ex Press  | PI-80-34A                   | _____                | _____ / _____ |

7.7 If any of the above instruments are not calibrated or not indicating normally, notify I&C.

N/A, instruments are calibrated AND indicating normally . . . . . ( ) \_\_\_\_\_ / \_\_\_\_\_

Initials/Date

7.8 Ensure the following portable test instrumentation is calibrated:

|   | <u>Instrument Name</u>                 | <u>Range Used</u> | <u>Instrument ID Serial No.</u> | <u>Cal Due Date</u> |
|---|--|-------------------|---------------------------------|---------------------|
| • | Vibration                              | <u>N/A</u>        | _____                           | _____/_____<br>IST  |
| • | Vibration                              | <u>N/A</u>        | _____                           | _____/_____<br>IST  |
| • | Time                                   | <u>N/A</u>        | _____                           | _____/_____<br>/    |
| • | Time                                   | <u>N/A</u>        | _____                           | _____/_____<br>/    |
| • | Thermocouple<br>Digital<br>Thermometer | <u>N/A</u>        | _____                           | _____/_____<br>/    |
| • | Non-Intrusive                          | <u>N/A</u>        | _____                           | _____/_____<br>/    |

7.9 Obtain a Radiation Work Permit (RWP), if required. \_\_\_\_\_/\_\_\_\_\_

7.10 The Containment Spray System is in a normal configuration in accordance with N1-OP-14. Any exceptions have been evaluated by the SSS and have no impact on the performance of this test. \_\_\_\_\_/\_\_\_\_\_  
SSS

7.11 IST verify vibration point Red Dots installed on 80-04, Containment Spray Pump 111 as indicated on Attachment 2, Containment Spray Pump Vibration Monitoring Points. Document vibration point Red Dots re-established in Section 10.2, Remarks. \_\_\_\_\_/\_\_\_\_\_  
IST

7.12 IST verify vibration point Red Dots installed on 93-02, Containment Spray Raw Water Pump 111 as indicated on Attachment 3, Containment Spray Raw Water Pump Vibration Monitoring Points. Document vibration point Red Dots re-established in Section 10.2, Remarks. \_\_\_\_\_/\_\_\_\_\_  
IST

7.13 Obtain SSS Permission to perform procedure and acknowledgement that temporary alterations are to be used.

Initials/Date

- PLANT IMPACT:
1. CONTAINMENT SPRAY LOOP 111 AND RAW WATER LOOP 111 OPERATE IN TORUS COOLING MODE.
  2. THIS PROCEDURE MAY REQUIRE ENTRY INTO A T.S. LCO. ALL T.S. APPLICABILITY STATEMENTS REFER TO FULL POWER OPERATION. T.S. MUST BE CONSULTED FOR PLANT CONDITIONS OTHER THAN RUN.
  3. 80-45, CONT SPRAY BYPASS BLOCKING VALVE IS CLOSED REQUIRING ENTRY INTO A 7 DAY LCO (CONT SP WTR SEAL).
  4. DRAIN HOSE IS INSTALLED AND REMOVED ON CONTAINMENT SPRAY SYSTEM.
  5. RUNNING CONT SPRAY PUMP REQUIRES LCO ENTRY FOR PUMP OPERABILITY (SE 98-104)

\_\_\_\_\_/\_\_\_\_\_  
SSS

7.14 Notify CSO that procedure is to be performed and that temporary alterations are used.

\_\_\_\_\_/\_\_\_\_\_

7.15 Record start time and date.

\_\_\_\_\_/\_\_\_\_\_  
Start Time                      Date

\_\_\_\_\_/\_\_\_\_\_

8.0 PROCEDURE

8.1 Containment Spray Loop 111 IV Testing

**NOTE:**            Cycling the following Containment Spray Valves renders the associated Cont. Spray Loop inoperable, T.S. 3.3.7.b applies.

8.1.1 Notify SSS to Log entry into appropriate LCO for Plant condition.

\_\_\_\_\_/\_\_\_\_\_

8.1.2 Place in PULL-TO-LOCK CONTAINMENT SPRAY PUMP 111.

\_\_\_\_\_/\_\_\_\_\_

8.1.3 Cycle 80-01, CONT SPRAY SUCTION ISOLATION VALVE 111, AND perform the following:

(IST)  
[T/S]

a. Record Open to Close Stroke Time for 80-01:

\_\_\_\_\_ sec ( $\geq 52.1$  sec AND  $\leq 70$  sec) [ $\leq 70$  sec]

\_\_\_\_\_/\_\_\_\_\_

b. Verify Open 80-01, CONT SPRAY SUCTION ISOLATION VALVE 111.

\_\_\_\_\_/\_\_\_\_\_

\_\_\_\_\_/\_\_\_\_\_  
Ind. Verif.\*

8.1.4 Cycle 80-16, CONT SPRAY DISCH IV 111, AND perform the following:

(IST) [T/S]

a. Record Open to Close Stroke Time for 80-16: \_\_\_\_\_ sec (>9 sec and <=15 sec) [<=60 sec] /

b. Record Close to Open Stroke Time for 80-16 \_\_\_\_\_ sec (>9.6 sec and <=16.1 sec) [<=60 sec] /

<EQ>

c. Check satisfactory operation of Valve Position Indicating Lights for 80-16. /

d. Independently verify Open 80-16, CONT SPRAY DISCH IV 111. /

Ind. Verif.\*

8.1.5 Place in green flag AUTO START position, CONTAINMENT SPRAY PUMP 111 control switch. /

Ind. Verif.\*

\*\*\*\*\*

**CAUTION**

During testing of 93-71 in Step 8.1.6.c below, failure to verify Cont. Spr. 111 HX Outlet Valve 93-25 full closed prior to giving close signal to 93-71, will result in 93-25 AND 93-71 being closed simultaneously. \*\*\*\*\*

8.1.6 Cycle 93-71, CONT SPRAY RAW WTR 111 INTERTIE, AND perform the following:

(IST)

a. Record Close to Open Stroke Time for 93-71: \_\_\_\_\_ sec (>17.3 sec and <=28.9 sec) /

b. Verify Closed 93-25. /

c. Record Open to Close Stroke Time for 93-71: \_\_\_\_\_ sec (>16.3 sec and <=27.2 sec) /

d. Independently verify Closed 93-71. /

Ind. Verif.\*

e. Verify Open 93-25. /

Ind. Verif.\*

**NOTE:** Cycling the following Containment Spray Valve renders Cont. Spray water seal inoperable, T.S. 3.3.7.d applies.

8.1.7 Notify SSS to Log entry into appropriate LCO for Plant condition. /

8.1.8 Cycle 80-40, CONT SPRAY BYPASS BV 111, AND Record the following stroke times.

(IST)

a. Record Open to Close stroke time for 80-40. \_\_\_\_\_ sec (>15.6 sec and <=26 sec) /

Initials/Date

8.1.8 (Cont)

b. Record Close to Open stroke time for 80-40.

\_\_\_\_\_ sec (>8.7 sec and <14.5 sec)

\_\_\_\_\_/\_\_\_\_\_

<EQ>

c. Check satisfactory operation of Valve Position Indicating Lights for 80-40.

\_\_\_\_\_/\_\_\_\_\_

d. Independently verify Open 80-40.

\_\_\_\_\_/\_\_\_\_\_

Ind. Verif.\*

8.1.9 Complete Section 10.1.1 for Containment Spray IV testing performed.

\_\_\_\_\_/\_\_\_\_\_

ASSS/SSS

8.1.10 Notify SSS Containment Spray valve testing complete and LCOs entered may be exited.

\_\_\_\_\_/\_\_\_\_\_

8.2 Containment Spray Loop 111 Pump and Check Valve Testing

8.2.1 Perform the following:

a. Record Lake level.

PI-73-32 \_\_\_\_\_ft

\_\_\_\_\_/\_\_\_\_\_

<EQ>

b. Verify lubrication level on the following pump motor bearings is in accordance with N1-PM-Q9:

• Containment Spray Pump 111.

\_\_\_\_\_/\_\_\_\_\_

• Containment Spray Raw Water Pump 111.

\_\_\_\_\_/\_\_\_\_\_

8.2.2 Verify the following Control Room SB Switch valve lineup:

• 80-01 open, CONT SPRAY SUCTION ISOLATION VALVE 111

( )

• 80-114 closed, CONT SPRAY TO RAD WASTE IV 11

( )

• 80-41 closed, CONT SPRAY BYPASS BV 121

( )

• 80-44 closed, CONT SPRAY BYPASS BV 112

( )

• 80-40 open, CONT SPRAY BYPASS BV 111

( )

• 93-25 open, CONT SPRAY RAW WTR 111 INTERTIE

( )

\_\_\_\_\_/\_\_\_\_\_

Initials/Date

8.2.3 Verify open the following in-plant valves:

- 80-43 BV - CONT SPRAY TEST TO TORUS AFTER  
FCV 80-118 ( ) \_\_\_\_\_
- 80-12 RATE SET - 111 CONT SPRAY HX INLET ( ) \_\_\_\_\_
- 80-08 BV - 111 CONT SPRAY PUMP DISCHARGE ( ) \_\_\_\_\_
- 93-14 BV - 111 CONT SPRAY RAW WATER PUMP  
DISCHARGE ( ) \_\_\_\_\_
- 93-17 BV - 111 CONT SPRAY HX RAW WATER INLET ( ) \_\_\_\_\_ / \_\_\_\_\_

**NOTE:** Closing the following Containment Spray Valve renders Cont. Spray water seal inoperable, T.S. 3.3.7.d applies.

8.2.4 Notify SSS to Log entry into appropriate LCO for Plant condition. \_\_\_\_\_ / \_\_\_\_\_

8.2.5 Close 80-45, CONT SPRAY BYPASS BV 122, \_\_\_\_\_ / \_\_\_\_\_

8.2.6 Close 80-16, CONT SPRAY DISCH IV 111. \_\_\_\_\_ / \_\_\_\_\_

8.2.7 Open 80-118, CONT SPRAY TEST TO TORUS FCV. \_\_\_\_\_ / \_\_\_\_\_

8.2.8 Unlock and close 93-65, BV-111 CTN SP RW TO CORE SPRAY LOOP 11. \_\_\_\_\_ / \_\_\_\_\_

8.2.9 Start CONTAINMENT SPRAY RAW WATER PUMP 111 and confirm the following:

- a. Pump packing lubrication has sufficient flow to prevent overheating, but water is not being thrown off shaft. \_\_\_\_\_ / \_\_\_\_\_
- b. Flow through bleed port line, temperature feels consistent with lake temperature (top line off casing). \_\_\_\_\_ / \_\_\_\_\_

**NOTE:** When throttling flowrate, attempt to establish the exact reference value given OR as close as practical within the allowable range provided.

8.2.10 IF required, throttle 93-21, RATE SET - 111 CONT SPRAY RAW WATER OUTLET as follows:

- a. Unlock AND remove tamper seal on 93-21. \_\_\_\_\_ / \_\_\_\_\_

Initials/Date

8.2.10 (Cont)

b. Throttle 93-21, to establish Containment Spray  
Raw Water Flow of  $160 \times 10^4$  lbm/hr ( $156.8 \times 10^4$   
to  $163.2 \times 10^4$  lbm/hr)

\_\_\_\_\_ / \_\_\_\_\_

8.2.11 Record Containment Spray Pump 111 discharge pressure.

Pressure \_\_\_\_\_ psig PI-80-47A (K Panel)

\_\_\_\_\_ / \_\_\_\_\_

8.2.12 Start CONTAINMENT SPRAY PUMP 111 (K Panel).

\_\_\_\_\_ / \_\_\_\_\_

8.2.13 If required, stop and restart CONTAINMENT SPRAY PUMP 111  
to support completion of step 8.2.14.

( ) N/A, not required.

\_\_\_\_\_ / \_\_\_\_\_

8.2.14 Verify Check Valve 80-06 is Exercised to full open  
(IST) position as determined by Non-Intrusive Test equipment.

( ) SAT ( ) UNSAT ( ) N/A, Refuel ONLY

\_\_\_\_\_ / \_\_\_\_\_

8.2.15 Throttle 80-118, CONT SPRAY TEST TO TORUS FCV  
(IST) to establish Containment Spray Flow of  $145 \times 10^4$  lbm/hr  
( $142.1 \times 10^4$  to  $147.9 \times 10^4$  lbm/hr)

\_\_\_\_\_ / \_\_\_\_\_

8.2.16 When pump combination has run in a stable condition  
(IST) for at least 5 minutes as indicated on the calibrated  
[T/S] stopwatch, record the following:

a. Torus Level.

\_\_\_\_\_ ft. LI-58-05A or LI-58-06A (K Panel)

\_\_\_\_\_ / \_\_\_\_\_

b. Containment Spray Pump 111 discharge pressure.

\_\_\_\_\_ psig PI-80-47A (K Panel)

\_\_\_\_\_ / \_\_\_\_\_

c. Containment Spray Pump 111 flow.

\_\_\_\_\_ lbm/hr FI-80-49B (K Panel)

\_\_\_\_\_ / \_\_\_\_\_

d. Containment Spray Raw Water Pump 111 discharge  
pressure.

\_\_\_\_\_ psig (PI-93-95 local)

\_\_\_\_\_ / \_\_\_\_\_

e. Containment Spray Raw Water Pump 111 flow.

\_\_\_\_\_ lbm/hr FI-93-30B (K Panel)

\_\_\_\_\_ / \_\_\_\_\_

8.2.16 (Cont)

**NOTE:** Steps 8.2.17 through 8.2.27 may be performed in the order convenient for the data takers.

\* \* \* \* \*

**CAUTION**

ALL system leakage must be documented to validate containment leakage assumptions and to ensure compliance with T.S. Section 6.14.

\* \* \* \* \*

8.2.17 (C2) Inspect AND record Containment Spray System component leakage using Attachment 4 AND initiate DER for individual component leakage > 1 GPM. (S.E. 94-036)

( ) DER N/A, leakage < 1GPM for each component.

\_\_\_\_\_ / \_\_\_\_\_

\* \* \* \* \*

**WARNING**

Failure to exercise caution to prevent the temperature probe from contacting any energized or moving parts when measuring stator housing temperatures may cause personnel endangerment and equipment damage.

\* \* \* \* \*

8.2.18 <EQ> Record the following temperatures, using a thermocouple digital thermometer:

- Containment Spray Room. \_\_\_\_\_ °F \_\_\_\_\_ / \_\_\_\_\_
- Containment Spray Pump 111 Inboard Mtr Bearing. \_\_\_\_\_ °F << 200°F > \_\_\_\_\_ / \_\_\_\_\_
- Containment Spray Pump 111 Outboard Mtr Bearing \_\_\_\_\_ °F << 200°F > \_\_\_\_\_ / \_\_\_\_\_

8.2.19 Record Containment Spray Pump 111 motor running current in Control Room (K Panel).

\_\_\_\_\_ amps. (≤ 53.5 amps) \_\_\_\_\_ / \_\_\_\_\_

8.2.20 Record Containment Spray Heat Exchanger 111 Shell Side pressure.

\_\_\_\_\_ psig PI-80-34A (local). \_\_\_\_\_ / \_\_\_\_\_

Initials/Date

- 8.2.21 Record Containment Spray Heat Exchanger 111 discharge pressure.  
[TS] \_\_\_\_\_ psig PI-93-47 (local).  
[≥ 141 psig.] \_\_\_\_\_ /
- 8.2.22 Verify PI-93-47 pressure is greater than PI-80-34A pressure. \_\_\_\_\_ /
- 8.2.23 Record Containment Spray Raw Water Pump 111 motor running current.  
\_\_\_\_\_ amps (K Panel).  
(≤76.5 amps) \_\_\_\_\_ /
- 8.2.24 IST perform Containment Spray Pump 111 vibration monitoring (refer to Attachment 2) in accordance with IST Procedure N1-ITP-02 AND record unfiltered peak velocity (in/sec) vibration data below:  
<EQ> (IST)
- Point 1V (Vertical) \_\_\_\_\_ in/sec  
(≤0.250 in/sec) IST /
  - Point 1H (Horizontal) \_\_\_\_\_ in/sec  
(≤0.250 in/sec) IST /
  - Point 1A (Axial) \_\_\_\_\_ in/sec  
(≤0.250 in/sec) IST /
- 8.2.25 IST perform Containment Spray Raw Water Pump 111 vibration monitoring (refer to Attachment 3) in accordance with IST Procedure N1-ITP-02 AND record unfiltered peak velocity (in/sec) vibration data below:  
(IST)
- Point 1V (Vertical) \_\_\_\_\_ in/sec  
(≤0.220 in/sec) IST /
  - Point 1H (Horizontal) \_\_\_\_\_ in/sec  
(≤0.207 in/sec) IST /
  - Point 1A (Axial) \_\_\_\_\_ in/sec  
(≤0.117 in/sec) IST /
- 8.2.26 IST Record Containment Spray Pump 111 speed in RPMs using Stroboscope.  
\_\_\_\_\_ RPMs. \_\_\_\_\_ /  
IST

Initials/Date

8.2.27 IST Record Containment Spray Raw Water Pump 111 speed in RPMs using Stroboscope.

\_\_\_\_\_ RPMs.

\_\_\_\_\_/\_\_\_\_\_  
IST

(IST) 8.2.28 Calculate 80-04, CONTAINMENT SPRAY PUMP 111 Suction Pressure.

$$P_i = (\text{_____ ft} + 7.54 \text{ ft}) \times (0.433 \text{ psi/ft})$$

(Step 8.2.16.a)

$$P_i = \text{_____ psig. } (>0.46 \text{ psig})$$

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_  
Ind. Verif.\*

(IST) 8.2.29 Calculate 80-04, CONTAINMENT SPRAY PUMP 111 Discharge Pressure.

$$P_o = \text{_____ psig} + 4.35 \text{ psig.}$$

(Step 8.2.16.b)

$$P_o = \text{_____ psig.}$$

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_  
Ind. Verif.\*

(IST) 8.2.30 Calculate 80-04, CONTAINMENT SPRAY PUMP 111 Differential Pressure.

$$\Delta P = \text{_____ psig} - \text{_____ psig}$$

(Step 8.2.29) (Step 8.2.28)

$$\Delta P = \text{_____ psid}$$

(154.917 to 179.377 psid)

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_  
Ind. Verif.\*

(IST) 8.2.31 Calculate 80-04, CONTAINMENT SPRAY PUMP 111 Flowrate in gpm.

$$Q = \text{_____ lbm/hr} \times 0.002 \frac{\text{gpm}}{\text{lbm/hr}}$$

(Step 8.2.16.c)

[T/S]  $Q = \text{_____ gpm}$   
(2842 to 2958 gpm) [ $\geq 2800$  gpm]

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_  
Ind. Verif.\*

8.2.32 Calculate 93-02, CONTAINMENT SPRAY RAW WATER PUMP 111  
(IST) Suction Pressure.

$$P_i = \left( \frac{\quad}{\text{Step 8.2.1a}} \text{ft} - 229.25 \text{ ft} \right) \times (0.433 \text{ psi/ft})$$

$$P_i = \frac{\quad}{(\geq 4.8 \text{ psig})} \text{ psig}$$

\_\_\_\_\_  
/  
\_\_\_\_\_  
/  
Ind. Verif.\*

8.2.33 Calculate 93-02, CONTAINMENT SPRAY RAW WATER PUMP 111  
(IST) Discharge Pressure.

$$P_o = \frac{\quad}{\text{Step 8.2.16.d}} \text{ psig} + 13.68 \text{ psig}$$

$$P_o = \frac{\quad}{\quad} \text{ psig}$$

\_\_\_\_\_  
/  
\_\_\_\_\_  
/  
Ind. Verif.\*

8.2.34 Calculate 93-02, CONTAINMENT SPRAY RAW WATER PUMP 111  
(IST) Differential Pressure.

$$\Delta P = \frac{\quad}{\text{Step 8.2.33}} \text{ psig} - \frac{\quad}{\text{Step 8.2.32}} \text{ psig}$$

$$\Delta P = \frac{\quad}{(189.829 \text{ to } 219.802 \text{ psid})} \text{ psid}$$

\_\_\_\_\_  
/  
\_\_\_\_\_  
/  
Ind. Verif.\*

8.2.35 Calculate 93-02, CONTAINMENT SPRAY RAW WATER PUMP 111  
(IST) Flowrate in gpm.

$$Q = \frac{\quad}{\text{Step 8.2.16.e}} \text{ lbm/hr} \times 0.002 \frac{\text{gpm}}{\text{lbm/hr}}$$

[T/S]  $Q = \frac{\quad}{(3136 \text{ to } 3264 \text{ gpm})} \text{ gpm} \quad [\geq 3055 \text{ gpm}]$

\_\_\_\_\_  
/  
\_\_\_\_\_  
/  
Ind. Verif.\*

8.2.36 If desired to lower torus water level, then perform the following:

- a. Notify Radwaste of intent to pump down Torus to Waste Collector Tank.

\_\_\_\_\_

8.2.36 (Cont)

- b. Open 80-115, CONT SPRAY TO RAD WASTE IV 12. \_\_\_\_\_ / \_\_\_\_\_
- c. Open 80-114, CONT SPRAY TO RAD WASTE IV 11. \_\_\_\_\_ / \_\_\_\_\_
- d. Throttle 80-118, CONT SPRAY TEST TO TORUS FCV to control flow to Waste Collector Tank. \_\_\_\_\_ / \_\_\_\_\_
- e. Monitor 58-05A and 58-06A, TORUS H<sub>2</sub>O LEVEL indicators, for level response. \_\_\_\_\_ / \_\_\_\_\_
- f. At desired Torus level, open 80-118, to reduce flow to Waste Collector Tank. \_\_\_\_\_ / \_\_\_\_\_
- g. Close 80-115, CONT SPRAY TO RAD WASTE IV 12. \_\_\_\_\_ / \_\_\_\_\_
- h. Close 80-114, CONT SPRAY TO RAD WASTE IV 11. \_\_\_\_\_ / \_\_\_\_\_
- ( ) N/A, Torus Level does not require lowering. \_\_\_\_\_ / \_\_\_\_\_

8.2.37 Place in STOP, CONTAINMENT SPRAY PUMP 111 control switch (K Panel). \_\_\_\_\_ / \_\_\_\_\_

8.2.38 Record Containment Spray Pump 111 discharge pressure. \_\_\_\_\_ psig PI 80-47A (K Panel). \_\_\_\_\_ / \_\_\_\_\_

8.2.39 Compare Containment Spray Pump 111 discharge pressures.  
 $\frac{8.2.38}{8.2.11} - \frac{8.2.11}{\text{Total}} = \text{_____} (<10)$  \_\_\_\_\_ / \_\_\_\_\_

\_\_\_\_\_  
Ind. Verif.

8.2.40 Apply 2-3 pumps or until grease flows from packing (which ever is less) of Mobilith AW2 grease to packing gland grease fitting of operating RW Pump. \_\_\_\_\_ / \_\_\_\_\_

8.2.41 Place in STOP, CONTAINMENT SPRAY RAW WATER PUMP 111 control switch (K Panel). \_\_\_\_\_ / \_\_\_\_\_

8.2.42 Complete Section 10.1.2, Acceptance Criteria, for Containment Spray Loop 111 pumps and check valves prior to continuing with this procedure. \_\_\_\_\_ / \_\_\_\_\_

9.0 RETURN TO NORMAL

9.1 Place CONTAINMENT SPRAY RAW WATER PUMP 111 Pull to Lock (PTL). \_\_\_\_\_ / \_\_\_\_\_



- 9.7 Open the following valves to drain Containment Spray Heat Exchanger 111:
- 93-131, DRAIN-111 CTN SP HX RW INLET TO RBFD.           /
  - 93-127, DRAIN-111 CTN SP HX RW OUTLET TO RBFD.           /
- 9.8 Confirm approximately two (2) hrs has elapsed since Containment Spray Pump 111 was secured.           /
- 9.9 Place in Pull-To-Lock Containment Spray Pump 111.           /
- 9.10 Close the following valves to Isolate 111 Containment Spray System:
- 80-178, VENT-111 CONT SPRAY HX SHELL INLET TO TORUS. . . . . (\_\_\_)
  - 80-182, VENT-111 CONT SPRAY HX SHELL TO TORUS. (Unlock and Close) . . . . . (\_\_\_)           /            
          /            
\*Ind. Verif.
  - 80-01 CONT SPRAY SUCTION ISOLATION VALVE 111. (\_\_\_)
  - 80-40, CONT SPRAY BYPASS BV 111. . . . . (\_\_\_)           /            
          /            
\*Ind. Verif.
- 9.11 Provide drain as follows:
- a. Remove pipe cap downstream of 80-153, DRAIN-2ND OUTSIDE OF CT SP IV 111 80-16.
  - b. Attach hose to pipe downstream of 80-153, AND route other end to floor drain.           /
- 9.12 Unlock AND open the following valves to drain system:
- 80-153, DRAIN-2ND OUTSIDE OF CT SP IV 111 80-16.           /
  - 80-152, DRAIN-1ST OUTSIDE OF CT SP IV 111 80-16.           /
- 9.13 Provide vent path by performing the following:
- a. Remove pipe cap downstream 80-140, LLRT-111 CONT SPRAY HX TEST CONN.           /
  - b. Open 80-140, LLRT-111 CONT SPRAY HX TEST CONN.           /

Initials/Date

9.14 Lock closed the following valves when draining complete:

- 80-152, DRAIN-1ST OUTSIDE OF CT SP IV 111 80-16.

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_

Ind. Verif.

- 80-153, DRAIN-2ND OUTSIDE OF CT SP IV 111 80-16.

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_

Ind. Verif.

9.15 Restore system to normal lineup as follows:

- a. Remove hose from pipe downstream of 80-153 and install pipe cap.

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_

\*Ind. Verif.

- b. Close 80-140, LLRT-111 CONT SPRAY HX TEST CONN.

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_

Ind. Verif.

- c. Install pipe cap downstream of 80-140.

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_

Ind. Verif.

9.16 Perform the following valves:

- Lock Open 80-182, VENT-111 CONT SPRAY HX SHELL TO TORUS.

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_

Ind. Verif.

- Open 80-178, VENT-111 CONT SPRAY HX SHELL INLET TO TORUS.

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_

Ind. Verif.

- Open 80-01, CONT SPRAY SUCTION ISOLATION VALVE 111.

\_\_\_\_\_/\_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_

Ind. Verif.

|      |  | <u>Initials/Date</u>           |
|------|--|--------------------------------|
| 9.17 | Place in green flag AUTO START position, CONTAINMENT SPRAY PUMP 111 control switch.                    | _____<br>_____<br>Ind. Verif.  |
| 9.18 | When water is no longer draining from Containment Spray Heat Exchanger 111 close the following valves: |                                |
|      | • 93-131 DRAIN-111 CTN SP HX RW INLET TO RBFD.   | _____<br>_____<br>*Ind. Verif. |
|      | • 93-127 DRAIN-111 CTN SP HX RW OUTLET TO RBFD.  | _____<br>_____<br>*Ind. Verif. |
|      | • 93-115, VENT 111 CTN SP HX RW OUTLET TO RBFD.  | _____<br>_____<br>*Ind. Verif. |
|      | • 93-119, VENT 111 CTN SP HX RW INLET TO RBFD.   | _____<br>_____<br>*Ind. Verif. |
| 9.19 | Lock closed 93-87, DRAIN-111 CTN SP RW BEFORE 93-65 TO RBFD.   | _____<br>_____<br>*Ind. Verif. |
| 9.20 | Place 111 CONT SPRAY RAW WATER INTERTIE switch to the DIS VLV 111 position AND verify:                 |                                |
|      | • 93-71, CONT SPRAY RAW WTR 111 INTERTIE (CORE SPR 11) CLOSED  | _____<br>_____<br>Ind. Verif.  |
|      | • 93-25, CONT SPRAY RAW WTR 111 INTERTIE (DIS VLV 111) OPEN  | _____<br>_____<br>Ind. Verif.  |
| 9.21 | Lock open 93-65, BV-111 CTN SP RW TO CORE SPRAY LOOP 11.   | _____<br>_____<br>Ind. Verif.  |
| 9.22 | Close 93-57, T CK VLV-CONT SPRAY RAW WATER 111   | _____<br>_____<br>Ind. Verif.  |

|      |  | <u>Initials/Date</u> |
|------|--|----------------------|
| 9.23 | Place in green flag AUTO START position CONTAINMENT SPRAY RAW WATER PUMP 111 control switch. | /                    |
| 9.24 | Verify closed:   | Ind. Verif.          |
|      | • 80-41, CONT SPRAY BYPASS BV 121  | /                    |
|      |  | Ind. Verif.          |
|      | • 80-44, CONT SPRAY BYPASS BV 112  | /                    |
|      |  | Ind. Verif.          |
| 9.25 | Verify open the following valves:  |                      |
|      | a. 80-40, CONT SPRAY BYPASS BV 111.  | /                    |
|      |  | Ind. Verif.          |
|      | b. 80-45, CONT SPRAY BYPASS BV 122.  | /                    |
|      |  | Ind. Verif.          |
|      | c. 80-16, CONT SPRAY DISCH IV 111.   | /                    |
|      |  | Ind. Verif.          |
| 9.26 | Close 80-118, CONT SPRAY TEST TO TORUS FCV.  | /                    |
|      |  | Ind. Verif.          |
| 9.27 | Verify closed the following valves:  |                      |
|      | • 80-115, CONT SPRAY TO RAD WASTE IV 12  | /                    |
|      |  | Ind. Verif.          |
|      | • 80-114, CONT SPRAY TO RAD WAST IV 11   | /                    |
|      |  | Ind. Verif.          |

|      |  | <u>Initials/Date</u>     |
|------|--|--------------------------|
| 9.28 | Notify SSS that LCO can be exited and record time.<br>Time _____ hrs.  | _____<br>/               |
| 9.29 | Verify locked 93-21, RATE SET-111 CONT SPRAY RAW<br>WATER OUTLET.  | _____<br>/<br>_____<br>/ |
|      |  | Ind. Verif.              |
| 9.30 | Verify tamper seal on 93-21, RATE SET-111 CONT SPRAY<br>RAW WATER OUTLET.  | _____<br>/<br>_____<br>/ |
|      |  | Ind. Verif.              |
| 9.31 | Verify all Independent Verification steps have<br>been completed.  | _____<br>/               |
| 9.32 | Verify that test personnel performing this<br>procedure have initialed and signed Attachment 1,<br>Test Personnel Signature and Initial Log. | _____<br>/               |
| 9.33 | Notify the SSS of test completion and of any<br>abnormal test results.   | _____<br>/               |
| 9.34 | Record stop time and date.   | _____<br>/               |
|      | _____<br>/   |                          |
|      | Stop Time _____ Date _____   |                          |

10.0 ACCEPTANCE CRITERIA

10.1 Operation Review

10.1.1 Containment Spray Loop 111 IVs Valve Test Results Meet IST, T/S and EQ acceptance criteria as follows:

a. T/S and IST test results

| Valve ID                                  | Test Direction    | Stroke Time            | IST ST Limit**   | T/S ST Limit             | Valve Test Results                     |
|---|-------------------|------------------------|--|--------------------------|--|
| 80-01<br>(Step 8.1.3.a)                   | O to C            | _____ sec              | > 52.1 sec;<br>< 70 sec                                | ≤ 70.0 sec               | ( ) SAT ( ) UNSAT                      |
| 80-16<br>(Step 8.1.4.a)<br>(Step 8.1.4b)  | O to C<br>C to O* | _____ sec<br>_____ sec | > 9 sec;<br>< 15 sec<br>≥ 9.6 sec;<br>≤ 16.1 sec       | ≤ 60.0 sec<br>≤ 60.0 sec | ( ) SAT ( ) UNSAT<br>( ) SAT ( ) UNSAT |
| 93-71<br>(Step 8.1.6.a)<br>(Step 8.1.6.c) | C to O<br>O to C  | _____ sec<br>_____ sec | ≥ 17.3 sec;<br>≤ 28.9 sec<br>≥ 16.3 sec;<br>≤ 27.2 sec | N/A<br>N/A               | ( ) SAT ( ) UNSAT<br>( ) SAT ( ) UNSAT |
| 80-40<br>(Step 8.1.8.a)<br>(Step 8.1.8.b) | O to C<br>C to O* | _____ sec<br>_____ sec | > 15.6 sec;<br>< 26 sec<br>≥ 8.7 sec;<br>≤ 14.5 sec    | ≤ 60.0 sec<br>≤ 30.0 sec | ( ) SAT ( ) UNSAT<br>( ) SAT ( ) UNSAT |

\* Acceptable valve exercising in the direction indicated verifies acceptable Fail Safe testing.

\*\* If any stroke time exceeds the IST stroke time/acceptance limit or if any IST acceptance criteria is exceeded, the valve shall be declared inoperable immediately. Notify the IST department of the inoperable valve.

b. Limit Switch and SOV EQ test results

| EPN  | Test Direction/ Indication | Acceptance Criteria                        | Test Results                               |
|--|----------------------------|--|--|
| 80-16-ILSC<br>80-16-ILSO<br>SOV-80-16C<br>SOV-80-16D | CYCLE                      | 80-16 Satisfactory VPI<br><br>80-16 Cycled | ( ) SAT ( ) UNSAT<br><br>( ) SAT ( ) UNSAT |
| 80-40-ILSC<br>80-40-ILSO<br>SOV-80-40B               | CYCLE                      | 80-40 Satisfactory VPI<br><br>80-40 Cycled | ( ) SAT ( ) UNSAT<br><br>( ) SAT ( ) UNSAT |

10.1.2 Containment Spray Loop 111 Motor, Pump and Check Valve Testing meets IST requirements.

a. Check valve data meets IST Acceptance Criteria.

| EPN                     | Test Direction/ | Acceptance Criteria  | Test Results  |
|-------------------------|-----------------|--|---|
| 80-06<br>Step<br>8.2.31 | PARTIAL FORWARD | FLOW $\geq$ 2842 GPM   | <input type="checkbox"/> SAT <input type="checkbox"/><br>UNSAT  |
| 80-06<br>Step<br>8.2.39 | REVERSE FLOW    | Change In Discharge Pressure<br>Less than 10   | <input type="checkbox"/> SAT <input type="checkbox"/><br>UNSAT  |
| 80-06<br>Step<br>8.2.14 | FULL FORWARD    | Check valve disk exercised<br>to<br>full open position as<br>determined by Non-intrusive<br>Test equipment | <input type="checkbox"/> N/A Refuel<br>Only<br><input type="checkbox"/> SAT <input type="checkbox"/><br>UNSAT |
| 93-10<br>STEP<br>8.2.35 | FULL FORWARD    | FLOW $\geq$ 3055 GPM   | <input type="checkbox"/> SAT <input type="checkbox"/><br>UNSAT  |
| 93-57<br>STEP<br>8.2.35 | FULL FORWARD    | FLOW $\geq$ 3055 GPM   | <input type="checkbox"/> SAT <input type="checkbox"/><br>UNSAT  |

\* Acceptable valve exercising in the direction indicated verifies acceptable Fail Safe testing.

\*\* If any stroke time exceeds the IST stroke time/acceptance limit or if any IST acceptance criteria is exceeded, the valve shall be declared inoperable immediately. Notify the IST Department of the inoperable valve.

b. Motor Current Limits

| EPN                     | MEASURED VALUE | Acceptance Criteria | Test Results   |
|-------------------------|----------------|---------------------|--|
| 80-04<br>Step<br>8.2.19 | _____ AMPS     | $\leq$ 53.5 AMPS    | <input type="checkbox"/> SAT <input type="checkbox"/><br>UNSAT |
| 93-82<br>Step<br>8.2.23 | _____ AMPS     | $\leq$ 76.5 AMPS    | <input type="checkbox"/> SAT <input type="checkbox"/><br>UNSAT |

The motor current limits have been established through disposition of DER 1-92-4195. If these limits are exceeded, generate a DER. The motor current limits are guide values and have no immediate impact on pump operability.

10.1.2 (Cont)

c. Containment Spray Pump 111 meets IST criteria

| TEST QUANTITY                             | MEASURE D VALUE | ACCEPTANCE RANGE |         | ALERT RANGE        |      | REQUIRED ACTION RANGE |          | OVERALL RESULTS |     |       |
|---|-----------------|------------------|---------|--------------------|------|-----------------------|----------|-----------------|-----|-------|
|   |                 | LOW              | HIGH    | LOW                | HIGH | LOW                   | HIGH     | ACC             | AL* | R/A** |
| SUCT PRESS (PSIG)<br>STEP 8.2.28          |                 | ≥0.46            | N/A     | N/A                | N/A  | N/A                   | N/A      |                 |     |       |
| DIFF PRESS (PSID)<br>STEP 8.2.30          |                 | 154.917          | 179.377 | 151.655 to 154.917 | N/A  | <151.655              | >179.377 |                 |     |       |
| FLOW GPM<br>STEP 8.2.31                   |                 | 2842             | 2958    | N/A                | N/A  | N/A                   | N/A      |                 |     |       |
| VIB. VERT. PT. 1V (IN/SEC)<br>STEP 8.2.24 |                 | ≤0.250           |         | >0.250             |      | >0.600                |          |                 |     |       |
| VIB. HRZ. PT. 1H (IN/SEC)<br>STEP 8.2.24  |                 | ≤0.250           |         | >0.250             |      | >0.600                |          |                 |     |       |
| VIB. AXIAL PT. 1A (IN/SEC)<br>STEP 8.2.24 |                 | ≤0.250           |         | >0.250             |      | >0.600                |          |                 |     |       |

\* Pump test results which fall into the Alert Range require that the test frequency be doubled until the cause is determined and condition corrected. Subsequently, inform the IST Department of the pump condition. Alert Range test results are considered satisfactory for continued operation.

\*\* Pump test results falling within the required action range shall be the basis for declaring the pump inoperable immediately. Notify the IST Department of the inoperable pump.

10.1.2 (Cont)

d. Containment Spray Raw Water Pump 111 meets IST criteria.

| TEST QUANTITY                              | MEASURED VALUE | ACCEPTANCE RANGE |             | ALERT RANGE              |      | REQUIRED ACTION RANGE |              | OVERALL RESULTS |     |       |
|--|----------------|------------------|-------------|--------------------------|------|-----------------------|--------------|-----------------|-----|-------|
|  |                | LOW              | HIGH        | LOW                      | HIGH | LOW                   | HIGH         | ACC             | AL* | R/A** |
| SUCT PRESS (PSIG)<br>STEP 8.2.32           |                | ≥ 4.8            | N/A         | N/A                      | N/A  | N/A                   | N/A          |                 |     |       |
| DIFF PRESS (PSID)<br>STEP 8.2.34           |                | 189.829          | 219.80<br>2 | 185.833<br>to<br>189.829 | N/A  | <185.833              | >219.80<br>2 |                 |     |       |
| FLOW (GPM)<br>STEP 8.2.35                  |                | 3136             | 3264        | N/A                      | N/A  | N/A                   | N/A          |                 |     |       |
| VIB. VERT. PT. 1V (IN/SEC)<br>STEP 8.2.25  |                | ≤ 0.220          |             | > 0.220                  |      | > 0.528               |              |                 |     |       |
| VIB. HORIZ. PT. 1H (IN/SEC)<br>STEP 8.2.25 |                | ≤ 0.207          |             | > 0.207                  |      | > 0.498               |              |                 |     |       |
| VIB. AXIAL PT. 1A (IN/SEC)<br>STEP 8.2.25  |                | ≤ 0.117          |             | > 0.117                  |      | > 0.282               |              |                 |     |       |

\* Pump test results which fall into the Alert Range require that the test frequency be doubled until the cause is determined and condition corrected. Subsequently, inform the IST Department of the pump condition. Alert Range test results are considered satisfactory for continued operation.

\*\* Pump test results falling within the required action range shall be the basis for declaring the pump inoperable immediately. Notify the IST Department of the inoperable pump.

10.1.3 Pump Motor Bearing Data Meets EQ Requirements

a. 80-04, Containment Spray Pump 111

1. Lubrication levels are satisfactory in accordance with N1-PM-Q9, Procedure for Operations Lubrication.

YES             NO

2. Bearing temperatures are ≤ 200°F.

YES             NO

10.1.3.a (Cont)

3. Vibration levels are satisfactory in accordance with NMP1 Pump and Valve IST Program Plan.

YES  NO

10.1.4 Pump Data Meets Technical Specification Acceptance Criteria.

a. 80-04, Containment Spray Pump 111.

1. Differential Pressure recorded in Step 8.2.30 vs. Flow recorded in Step 8.2.31 fall on OR above the minimum performance curve in MDC-11, Appendix A to assure 3600 gpm at 87.7 psid.

YES  NO

2. Flow recorded in Step 8.2.31 is  $\geq 2800$

YES  NO

b. 93-02, Containment Spray Raw Water Pump 111.

1. Flow recorded in Step 8.2.35 is  $\geq 3055$  gpm.

YES  NO

2. Pressure recorded in Step 8.2.21 is  $\geq 141$  psig.

YES  NO

10.1.5 All test documents completed.  YES  NO

\_\_\_\_\_  
Completed by SSS/ASSS      /      /  
Date      Time

10.1.6 SSS Review

Satisfactory, no corrective action required.

Satisfactory, corrective action required. (Explain in Remarks Section as necessary and initiate PID).

Unsatisfactory (Explain in Remarks section as necessary, Initiate a PID and immediately notify the \*Manager Operations or designee).



10.2 IST Review

- ( ) Satisfactory, no corrective action required.
- ( ) Increased test frequency required (list equipment in Remarks Section).
- ( ) Recommendations (Explain in Remarks Section).

Remarks:

---

---

---

\_\_\_\_\_  
Signature IST      Date      /      Time      /

10.3 Second Operations Review

All test data reviewed, all documentation completed.

\_\_\_\_\_  
STA/SRO Signature      Date

10.4 Forward a copy of identified leakage on Att. 4 to Tech. Support.

\_\_\_\_\_  
Control Room  
Clerk



ATTACHMENT 2: CONTAINMENT SPRAY PUMP VIBRATION MONITORING POINTS

ATTACHMENT 3: CONTAINMENT SPRAY RAW WATER PUMP VIBRATION MONITORING POINTS

ATTACHMENT 4: CONTAINMENT SPRAY SYSTEM LEAKAGE 111 LINE

| <u>EPN</u> | <u>DESCRIPTION</u>   | <u>LEAKAGE</u> | <u>Initials/Date</u> |
|------------|--|----------------|----------------------|
| -RB 198-   |  |                |                      |
| 80-01      | IV - 111 CONT SPRAY PUMP SUCTION   | _____          | _____/_____          |
| 80-163     | DRAIN - 111 CONT SPRAY PUMP SUCTION IV   | _____          | _____/_____          |
| 80-92      | BALL JOINT - 111 CONT SPRAY SYSTEM   | _____          | _____/_____          |
| 80-93      | BALL JOINT - 111 CONT SPRAY SYSTEM   | _____          | _____/_____          |
| 80-46      | PS - 111 CONT SPRAY PUMP suction Pressure Switch and all Associated Fittings                                 | _____          | _____/_____          |
| 80-04      | PUMP - CONTAINMENT SPRAY PUMP 111 and all associated fittings  | _____          | _____/_____          |
| 80-04      | PUMP - CONTAINMENT SPRAY PUMP 111 packing (estimate volume, should be adequate for pump cooling AND minimal) | _____          | _____/_____          |
| 80-202     | VENT - 111 CONT SPRAY PUMP - 1ST   | _____          | _____/_____          |
| 80-194     | VENT - 111 CONT SPRAY PUMP - 2ND   | _____          | _____/_____          |
| 80-102A    | RELIEF - 111 CONT SPRAY PUMP motor Cooling and associated fittings   | _____          | _____/_____          |
| 80-47      | PT - 111 CONT SPRAY PUMP Pressure Transmitter and associated fittings  | _____          | _____/_____          |
| 80-105A    | STRAINER - 111 CTN SP PUMP COOLING WATER   | _____          | _____/_____          |
| 80-206     | DRAIN - 111 CTN SP PUMP COOLING WATER STRAINER   | _____          | _____/_____          |
| 80-103A    | PCV - 111 CTN SP PUMP COOLING WATER  | _____          | _____/_____          |
| 80-06      | CHECK VALVE - 111 CONT SPRAY PUMP DISCH  | _____          | _____/_____          |
| 80-08      | BV - 111 CONT SPRAY PUMP DISCHARGE   | _____          | _____/_____          |
| -RB 218-   |  |                |                      |
| 80-222     | DRAIN - 1ST FOR CONT SPRAY STRAINER 111  | _____          | _____/_____          |
| 80-218     | DRAIN - 2ND FOR CONT SPRAY STRAINER 111  | _____          | _____/_____          |
| 80-214     | VENT - 1ST FOR CONT SPRAY STRAINER 111   | _____          | _____/_____          |
| 80-210     | VENT - 2ND FOR CONT SPRAY STRAINER 111   | _____          | _____/_____          |
| 80-48K1    | ROOT - DPIS 80-48-111 CTN SP FLT DP-HI SIDE  | _____          | _____/_____          |
| 80-48K2    | ROOT - DPIS 80-48-111 CTN SP FLT DP-LO SIDE  | _____          | _____/_____          |

ATTACHMENT 4 (Cont)

| <u>EPN</u> | <u>DESCRIPTION</u>  | <u>LEAKAGE</u> | <u>Initials/Date</u> |
|------------|---|----------------|----------------------|
| 80-10      | STRAINER - 111 CTN SPRAY STRAINER<br>-RB 261-TRACKBAY-        | _____          | _____/_____          |
| 80-49      | FE - 111 CTN SPRAY Flow Element<br>-RB 318-                   | _____          | _____/_____          |
| 80-50      | TE - 111 CTN SPRAY Temperature Element                        | _____          | _____/_____          |
| 80-178     | VENT - 111 CONT SPRAY HX SHELL INLET TO TORUS                 | _____          | _____/_____          |
| 80-12      | RATE SET - 111 CONT SPRAY HX SHELL INLET TO TORUS             | _____          | _____/_____          |
| 80-182     | VENT - 111 CONT SPRAY HX SHELL TO TORUS                       | _____          | _____/_____          |
| 80-140     | LLRT - 111 CONT SPRAY HX TEST CONN                            | _____          | _____/_____          |
| 80-34      | HX - 111 CONT SPRAY HEAT EXCHANGER                            | _____          | _____/_____          |
| 80-34A     | PI - 111 HX PRESS INDICATOR and all Associated Fittings       | _____          | _____/_____          |
| 80-190     | DRAIN - 111 CONT SPRAY HX SHELL TO TORUS and Downstream Union | _____          | _____/_____          |
| 80-201     | ROOT - PI 80-34A CT SP HX 111 SHELL                           | _____          | _____/_____          |
| 80-86      | STRAINER - 111 HX Y-STRAINER                                  | _____          | _____/_____          |
| 80-186     | DRAIN - 111 CTN SP HX VENT STRAINER TO TORUS                  | _____          | _____/_____          |
| 93-83      | DRAIN - 121 CTN SP RW AFTER 93-73                             | _____          | _____/_____          |
| 93-73      | BV - 121 CTN SP RW TO CONT SPRAY LOOP 111<br>-RB 298          | _____          | _____/_____          |
| 80-155     | SAMPLE - CONT SPRAY HX 111 OUTLET                             | _____          | _____/_____          |
| 80-52      | TE - Temperature Element                                      | _____          | _____/_____          |
| 80-40      | BV - 111 CONT SPRAY LOOP TEST<br>-RB 281                      | _____          | _____/_____          |
| 80-16      | IV - CONT SPRAY DISH IV 111                                   | _____          | _____/_____          |
| 80-152     | DRAIN - 1ST OUTSIDE OF CT SP IV 111 80-16                     | _____          | _____/_____          |
| 80-153     | DRAIN - 2ND OUTSIDE OF CT SP IV 111 80-16                     | _____          | _____/_____          |

ATTACHMENT 5: EQ COMPONENT MATRIX

A. Limit Switches, EQRM 4B

| <u>EPN</u> | <u>Satisfactory Operation Demonstrated by:</u> |
|------------|--|
| 80-16-1LSC | VPI during cycling of 80-16                    |
| 80-16-1LSO | VPI during cycling of 80-16                    |
| 80-40-1LSC | VPI during cycling of 80-40                    |
| 80-40-1LSO | VPI during cycling of 80-40                    |

B. SOVs, EQRM 8G

| <u>EPN</u> | <u>Satisfactory Operation Demonstrated by:</u> |
|------------|--|
| SOV-80-16C | Satisfactory operation of 80-16                |
| SOV-80-16D | Satisfactory operation of 80-16                |

C. SOVs, EQRM 8F

| <u>EPN</u> | <u>Satisfactory Operation Demonstrated by:</u> |
|------------|--|
| SOV-80-40B | Satisfactory operation of 80-40                |

D. Pump Motor Bearings, EQRM 16

| <u>EPN</u> | <u>Satisfactory Operation Demonstrated by:</u>   |
|------------|--|
| 80-04      | Lubrication levels satisfactory in accordance with N1-PM-Q9, Procedure for Operations Lubrication. |
| 80-04      | Bearing temperatures $\leq 200^{\circ}\text{F}$ .  |
| 80-04      | Vibration levels satisfactory in accordance with NMP1 Pump and Valve IST Program Plan.             |

20 A 1

| Nine Mile Point 1<br>Category "A" - Examination Outline Cross Reference |                        |
|---|------------------------|
| Operating Test Number   | Cat "A" Test: 1        |
| Examination Level   | RO                     |
| Administrative Topic  | A.1                    |
| Subject Description:  | Parameter Verification |
| Question Number:  | 1                      |

**Question:**

During a startup the Electric Pressure Regulator (EPR) fails and is removed from service. Reactor power is 42%. What is the new limiting value of MCPR?

**Answer:**

MFLCPR must be lowered to less than the Fraction of Rated Thermal Power (FRTTP) which in this case is 0.42.

$MCPR = 1.46$  at 100% power and at 42% =  $1.46 \times 0.42 = .6132$

**Technical Reference(s):**  
T.S. 2.1 and COLR

| K/A #:                                      | Importance: |
|---|-------------|
| 2.1.7, 2.1.10,<br>2.1.19, 2.1.33,<br>2.2.22 |             |

**Comments:**

STELL  
LOW V. COM  
AT ER

TABLE 1

NINE MILE POINT UNIT 1:  
 CYCLE 14 LIMITING CONDITION FOR OPERATION MCPR

| Core Average Incremental Exposure, MWD/STU   | <u>Limiting MCPR<sup>(1)(2)(3)</sup></u> |
|--|--|
| BOC to EOC   | All Fuel Types<br>≥ 1.46                 |
| (1) <i>Based on a 1.07 MCPR Safety Limit (SLCPR).</i>  |  |
| (2) <i>If the feedwater pump configuration as defined by Nuclear Engineering Report No. NER-1M-022 is such that a feedwater controller failure could result in maximum feedwater flow greater than that for two feedwater pumps (i.e., the shaft-driven pump plus one motor-driven pump), then the limiting MCPR for all fuel types shall be ≥ 1.59.</i> |  |
| (3) <i>Conservative limits have been established for operations with one of two pressure regulators out-of-service. The MCPR based limit for operation with one of two pressure regulators out-of-service is as follows:</i>   |  |
| <i>For operation below 90% of rated power, maintain MFLCPR less than or equal to the fraction of rated power at which the reactor is operating.</i>  |  |
| <i>For operation at or above 90% of rated power, no MFLCPR penalty is necessary.</i>   |  |

| Nine Mile Point<br>Category "A" - Examination Outline Cross Reference |                        |
|---|------------------------|
| Operating Test Number   | Cat "A" Test: 1        |
| Examination Level   | RO                     |
| Administrative Topic  | A.1                    |
| Subject Description:  | Parameter Verification |
| Question Number:  | 2                      |

**Question:**

If the value for CMFLPD is 1.006 on a P3 (3D Monicore Edit) what Thermal Limit is being exceeded?

**Answer:**

CMFLPD = The maximum core value of ACTUAL BUNDLE LHGR/LHGR LIMIT

In this case 1.006 = Actual Bundle LHGR/11 KW/FT

$1.006 \times 11 \text{KW/FT} = 11.066 \text{ KW/FT}$  which exceeds the Linear Heat Generation Limit (LHGR) of 11KW/FT

**Technical Reference(s):**  
T.S. 2.1.2, COLR

| K/A #:                                      | Importance: |
|---|-------------|
| 2.1.7, 2.1.10,<br>2.1.19, 2.1.33,<br>2.2.22 |             |

**Comments:**

3.0 Linear Heat Generation Rate (LHGR)

3.1 Limits for Technical Specification 3.1.7.b

During power operation, the Linear Heat Generation Rate (LHGR) of any rod in any fuel assembly at any axial location shall not exceed the limits shown below:

| <u>Fuel Type</u> | <u>LHGR(KW/FT)<sup>(1)</sup></u> |
|------------------|----------------------------------|
| GE11             | ≤ 11.0                           |

- (1) *Conservative limits have been established for operations with one of two pressure regulators out-of-service. The LHGR based limit for operation with one of two pressure regulators out-of-service is as follows:*

*For operation below 90% of rated power, maintain MFLPD less than or equal to the fraction of rated power at which the reactor is operating*

*For operation at or above 90% of rated power, no MFLPD penalty is necessary.*

**SAFETY LIMIT**

- c. The neutron flux shall not exceed its scram setting for longer than 1.5 seconds as indicated by the process computer. When the process computer is out of service, a safety limit violation shall be assumed if the neutron flux exceeds the scram setting and control rod scram does not occur.

To ensure that the Safety Limit established in Specifications 2.1.1a and 2.1.1b is not exceeded, each required scram shall be initiated by its expected scram signal. The Safety Limit shall be assumed to be exceeded when scram is accomplished by a means other than the expected scram signal.

- d. Whenever the reactor is in the shutdown condition with irradiated fuel in the reactor vessel, the water level shall not be more than 6 feet, 3 inches (-10 inches indicator scale) below minimum normal water level (Elevation 302'9") except as specified in "e" below.
- e. For the purpose of performing major maintenance (not to exceed 12 weeks in duration) on the reactor vessel; the reactor water level may be lowered 9' below the minimum normal water level (Elevation 302'9"). Whenever the reactor water level is to be lowered below the low-low level setpoint redundant instrumentation will be provided to monitor the reactor water level.

**LIMITING SAFETY SYSTEM SETTING**

$T = \text{FRTP}/\text{CMFLPD}$  (T is applied only if less than or equal to 1.0)

FRTP = Fraction of Rated Thermal Power where Rated Thermal Power equals 1850 MW

CMFLPD = Core Maximum Fraction of Limiting Power Density

With CMFLPD greater than the FRTP for a short period of time, rather than adjusting the APRM setpoints, the APRM gain may be adjusted so that APRM readings are greater than or equal to 100% times CMFLPD provided that the adjusted APRM reading does not exceed 100% of rated thermal power and a notice of adjustment is posted on the reactor control panel.

- b. The IRM scram trip setting shall not exceed 12% of rated neutron flux for IRM range 9 or lower.
- The IRM scram trip setting shall not exceed 38.4% of rated neutron flux for IRM range 10.
- c. The reactor high pressure scram trip setting shall be  $\leq 1080$  psig.
- d. The reactor water low level scram trip setting shall be no lower than -12 inches (53 inches indicator scale) relative to the minimum normal water level (302'9").

no A2

| Nine Mile Point 1<br>Category "A" - Examination Outline Cross Reference |                 |
|---|-----------------|
| Operating Test Number   | Cat "A" Test: 1 |
| Examination Level   | RO              |
| Administrative Topic  | A.2             |
| Subject Description:  | Tagging         |
| Question Number:  | 1               |

| Question:  |
|--|
| <p>During a refueling outage a markup will be issued on the Hydrogen Seal Oil system for cleaning the tank. Other work will also be performed under this markup, including:</p> <ul style="list-style-type: none"><li>• Replacing the differential pressure control valve</li><li>• Rebuilding the main seal oil pump motor</li></ul> <p>What are your responsibilities as an independent verifier to ensure adequate personnel protection is provided when verifying this markup during the development and review process?</p> |

| Answer:  |
|--|
| <p>Review the markup and ensure:<br/>Required points of protections to ensure adequate protection is afforded for all work to be performed.</p> <ul style="list-style-type: none"><li>• Verify all inlets to the H<sup>2</sup> Seal Oil Tank are isolated</li><li>• At least one drain valve is tagged open to maintain affected portions of the system depressurized (open the drain and or vent valve on the isolated filter).</li><li>• Hazardous Energy (electric and fluid) removed to the affected portions of the system. (The differential pressure control valve can be isolated, and the Main Seal Oil Pump/Recirculation Seal Oil Pump motor breaker must be opened to remove electrical energy.)</li></ul> |

| Technical Reference(s): |
|-------------------------|
| GAP-OPS-02, Section 3.2 |

| K/A #: | Importance: |
|--------|-------------|
| 2.2.13 |             |

*Ed  
Beckman PRS  
for  
A  
component*

Comments:

|  |
|--|
|  |
|--|



3.2.1 (Cont)

(C3)

d. If applicable, verify that the mark-up/holdout is consistent with the plant impact as described in the work document.

(C13)

e. For piping systems to be breached, a method shall be used to keep the affected portion depressurized.

1. IF available, tag open at least one vent OR drain.

2. IF no vent or drain is available, THEN other means may be used as approved by the SSS and the Controller.

(C4)

f. Identify the tag application sequence.

g. IF the work activity requires the use of freeze seals, THEN indicate the following on the form:

**PRIOR TO COMMENCING WORK, A FREEZE  
SEAL MUST BE ESTABLISHED TO  
SUPPORT THE WORK ACTIVITY.  
CONTACT MECHANICAL MAINTENANCE**

(C8)

h. IF the markup/holdout involves fire suppression OR fire detection systems, THEN indicate the following on the form:

**CSO  
NOTIFY THE FIRE CHIEF PRIOR  
TO HANGING & WHEN CLEARING  
THIS MARKUP/HOLDOUT**

i. IF the work activity involves exposing of electrical circuits, THEN indicate the following on the coversheet:

**ELECTRICAL CIRCUITS WILL BE  
EXPOSED. GROUNDS AND/OR  
OTHER PROTECTIVE MEANS MAY  
BE REQUIRED TO PERFORM WORK.**

j. Tags may be prepared/printed at this time or at a later time prior to application. When tags are prepared/printed they shall be verified accurate with the application sheet.

k. Enter initials on the coversheet and attach the Equipment Markup/Holdout Request to the markup.

**NOTE:** The preparer's initials signifies that the markup provides adequate personnel protection for the work as indicated by the application sheet markup points.

C5, C12)

3.2.2 The Controller shall submit the proposed markup/holdout for independent verification to a licensed Reactor Operator, Senior Reactor Operator, OR other technically qualified individual other than the markup writer which may include but is NOT limited to:

(C8)

- For radwaste systems/components, a Chief Radwaste Operator OR Radwaste Operator "C".
- For security systems/components, the Security I&C Chief Technician OR Security Supervision.
- For fire protection systems/components, the Fire Chief OR Fire Protection management personnel.
- For reactor vessel instrumentation, the I&C Planning Group OR I&C Supervision.
- For plant systems/components other than those identified above, an Engineer OR Maintenance Personnel.

(C18)

3.2.3 The Independent Verifier shall review the proposed markup/holdout ensuring:

(C4)

- a. FOR MARKUPS, ADEQUATE PERSONNEL PROTECTION IS AFFORDED FOR THE WORK TO BE PERFORMED.
- b. The sequence and method of application are correct AND annotated.
- c. The numbers for circuits, valves, switches, fuses, etc. are correctly transcribed onto the markup/holdout sheet.
- d. The markup/holdout number is correctly transcribed onto the tags if the tags are prepared/printed.
- e. IF applicable, the markup/holdout is consistent with the plant impact as described in the work document.

(C3)

3.2.4 The Independent Verifier(s) shall enter initials on the coversheet in the box labeled "VERIFIED BY."

### 3.3 Markup/Holdout Approval

3.3.1 The SSS shall verify the markup/holdout has been properly reviewed AND:

(C3)

- a. Review the impact on OR restrictions to plant operation, Technical Specifications, UFSAR, and other administrative restrictions.

| <b>Nine Mile Point 1<br/>Category "A" - Examination Outline Cross Reference</b> |                 |
|---|-----------------|
| Operating Test Number   | Cat "A" Test: 1 |
| Examination Level   | RO              |
| Administrative Topic  | A.2             |
| Subject Description:  | Tagging         |
| Question Number:  | 2               |

**Question:**

During the application of a markup for electrical work on safety-related equipment, the job is cancelled while the tags are being hung:

- Four (4) of the ten (10) tags on the markup have been hung on repositioned components but have NOT been independently verified.
- The other six (6) tags have NOT been hung and the designated components have NOT been repositioned.

The SSS has determined that it is not appropriate to hang the remaining six tags because of a safety concern.

As the Markup Controller, what actions are necessary to void this markup?

**Answer:**

- Indicate why voided on the markup coversheet.
- Identify the markup "issued" in the markup computer. Print a restoration sheet.
- For the 6 tags not applied:
  - Verify tags are present for components.
  - Footnote the "REMARKS" section of the restoration sheet indicating tags not applied and accounted for. Precede the footnote with an asterisk. Place an asterisk in the "INITIAL" column for each applicable device.
- SSS and Controller determine the proper restoration lineup.
- When directed by the SSS to clear the markup, initial the "TAGS REMOVED BY ORDER OF" box on the restoration sheet.
- Direct clearance of the markup ensuring:
  - Restoration sequence and restoration positions are specified on the restoration sheet.
  - Authorize the restoration by initialing the "TAGS REMOVED BY ORDER OF" box on the restoration sheet.
  - An operator clears the tags and restores the affected components in the sequence specified. An independent verification is required.
  - A licensed reactor operator shall clear or independently verify the removal of tags from safety-related devices.
- Review the cleared markup and log the markup as cleared.
- Clear the markup in the computer.

**Technical Reference(s):**

GAP-OPS-02, Section 3.13, 3.12

**K/A #:**

2.2.13

**Importance:****Comments:**

3.11.10 (Cont)

- a. Walking down AND verifying the condition of the circuit or equipment AND status of work.
- b. ENSURING THE ORIGINAL OTHER IS INFORMED OF THE CLEARANCE IMMEDIATELY UPON RETURN TO WORK.

3.11.11 IF the OTHER and the responsible supervisor are NOT on site, the SSS can sign per Step 2.2.2.

**3.12 Markup/Holdout Clearance and Restoration**

3.12.1 Normally the Markup Person MARKS CLEAR on a markup.

- a. IF the Markup Person is NOT on site AND clearance is required, the Markup Person's Supervisor may take full responsibility as the Markup Person and MARK CLEAR.
- b. IF the Markup Person AND the responsible supervisor are NOT on site, the SSS can sign per Step 2.2.2.

3.12.2 BEFORE marking clear, the Markup Person shall ensure NO conditions exist that preclude clearance (blind flanges installed or removed, components reassembled, etc.).

3.12.3 AFTER verifying conditions permit, the Markup Person shall MARK CLEAR as follows:

- a. Clear workers from the circuit or equipment AND ensure OTHERS working under the markup are MARKED CLEAR.
- b. Report to the Controller the termination of the markup (the component/system should now be considered energized), stating:
  - markup AND work order number;
  - changes OR repairs made; and,
  - completion of work or changes in work scope require new markup.
- c. Enter signature, date, and time on the coversheet (the controller may sign for the Markup Person).

3.12.4 The Controller shall:

- a. Verify the Markup Person and, IF applicable, OTHERS working under the markup have MARKED CLEAR.
- b. Notify the SSS that the Markup Person and OTHERS have MARKED CLEAR and the markup is terminated.

- 3.12.5 The SSS and Controller shall ensure proper lineup restoration in accordance with applicable procedures and component lineup information.
- a. The SSS may waive the requirement to perform component lineups. This waiver shall be logged by the SSS.
  - b. IF instrumentation has been drained for maintenance or testing, the following shall be performed BEFORE declaring the instrumentation operable:

3.12.5.b (Cont)

1. The SSS and Controller shall determine which instruments need to be filled and vented. Assistance from I&C should be obtained to make this determination.

**NOTE:** IF venting is NOT required, THEN the instrumentation may be declared operable.

2. IF appropriate, I&C should fill and vent identified instrumentation.

- 3.12.6 WHEN conditions allow systems, structures, and components under a markup/holdout to be returned to service, the SSS shall:

- a. Verify the markup is MARKED CLEAR
- b. Direct the CSO to clear the markup/holdout.
- c. Enter initials in the "TAGS REMOVED BY ORDER OF" box on the markup restoration sheet.

- 3.12.7 The CSO shall direct clearance of the markup/holdout, ensuring:

- a. The status of affected systems, structures, and components is accurately known AND plant conditions are appropriate for restoration to the normal or desired lineup.
- b. The component restoration sequence AND restoration position are specified on the restoration sheet as verified from the applicable procedure or system lineup.
- c. IF the component/system is NOT to be returned to the normal line-up, a holdout is prepared, as necessary, per applicable requirements of this procedure.
- d. The restoration is authorized by initialing the "TAGS REMOVED BY ORDER OF" box on the markup restoration sheet.

(C4, C17)

(C2)

3.12.7 (Cont)

(C8, C15)

e. IF the markup/holdout involves fire detection/suppression systems, the Fire Chief is notified of the pending clearance.

(C12)

f. Operators (includes Radwaste Operators for Radwaste systems) are assigned to clear the markup/holdout AND, for safety-related systems, structures, or components, to independently verify the clearance (unless waived by the SSS per Step 3.4.2).

1. A licensed Reactor Operator shall clear OR independently verify the removal of tags from safety-related devices.

2. IF applicable, assigned Operators/(Radwaste Operators for Radwaste systems) shall understand plant impacts, precautions or limitations, AND special monitoring requirements.

3.12.8 The assigned Operators/(Radwaste Operators for Radwaste systems) shall clear the markup/holdout per the following, IF applicable:

a. IF the markup was for work that breached a system, THEN walk down the portion of the system that was breached to ensure system integrity.

(C4)

b. Using a working copy of the restoration sheet and in the sequence specified, remove tag from AND realign each component as required.

c. Verify alignment of equipment using component indicators (status lights, annunciators, position indicator lights, etc.).

d. Remove associated reference tags.

e. AFTER completion of the restoration, enter initials, date and time and, IF different than "RESTORATION POSITION," THEN enter device position in the "LEFT ACTUAL" box (IF positions are the same, no entry is required).

3.12.9 The Independent Verifier should minimize interaction with the individual clearing the markup/holdout. IF concurrent verification is deemed appropriate, physical separation is NOT required. The verifier shall:

a. Verify expected conditions AND component realignments against the written markup/holdout requirements.

3.12.9 (Cont)

- b. Ensure tags are properly removed.
- c. Document independent verification by entering initials, date and time on the restoration sheet.

3.12.10 The Controller shall review the cleared markup/holdout AND perform the following:

(C8, C15)

- a. IF fire detection OR suppression systems are involved, notify the SSS AND the Fire Chief of the clearance.
- b. Log the markup/holdout cleared.
- c. Notify the SSS of any device NOT returned to its restoration position as identified in step 3.12.8.e.

3.12.11 The SSS shall review the cleared markup/holdout and ensure the following, IF applicable:

(C6)

- a. The associated ESL entry is cleared OR revised as required, AND initials are entered on the markup/holdout coversheet (to indicate clearance).
- b. BEFORE declaring a system, structure OR component identified in the Technical Specifications operable, review Tech Spec LCO/Surveillance requirements AND Post-Maintenance Testing requirements, as applicable; AND perform required actions OR tests.

3.13 Markup/Holdout Voiding

(C16)

3.13.1 To void an approved markup that has been applied OR partially applied, the Controller shall ensure:

- a. Markup is identified as "issued" in the markup computer, AND a note is entered on the coversheet explaining why the markup is voided.
- b. A restoration sheet is printed out.
- c. The applied portion is cleared per Section 3.12 of this procedure.
- d. For any portion of the markup not yet applied:
  - 1. Verify tags are present for components listed on the application sheet.
  - 2. Place a footnote in the "REMARKS" section of the restoration sheet similar to the following: "TAGS NOT APPLIED, ALL TAGS ACCOUNTED FOR," preceded with an asterisk. Place an asterisk in the "INITIAL" column for each applicable device.
  - 3. Clear the markup in the computer.

|   |                                    |
|---|------------------------------------|
| <b>Nine Mile Point 1</b>                                  |                                    |
| <b>Category "A" - Examination Outline Cross Reference</b> |                                    |
| Operating Test Number                                     | Cat "A" Test: 1                    |
| Examination Level   | RO                                 |
| Administrative Topic                                      | A.3                                |
| Subject Description:                                      | Radiological Procedures & Controls |
| Question Number:  | 1                                  |

**Question:**

Use the attached Supplemental Radiation Survey Log Sheet for the Reactor Building 261' RWCU Corridor and RWCU Heat Exchanger Room, to answer this question.

State the radiological posting(s) required at the entrance to the area **and** identify on the map the information that supports the posting(s).

**Answer:**

Posted as:

- Locked High Radiation Area – identifies either the 1000 mrem/hr adjacent to the Regenerative Heat Exchanger or the 3500 mrem/hr near IV-33-04 to justify the posting.
- Contaminated Area – Identifies a smear location that is > 400 dpm/100 cm<sup>2</sup> removable beta-gamma (smear locations 1 – 13 all require the posting).

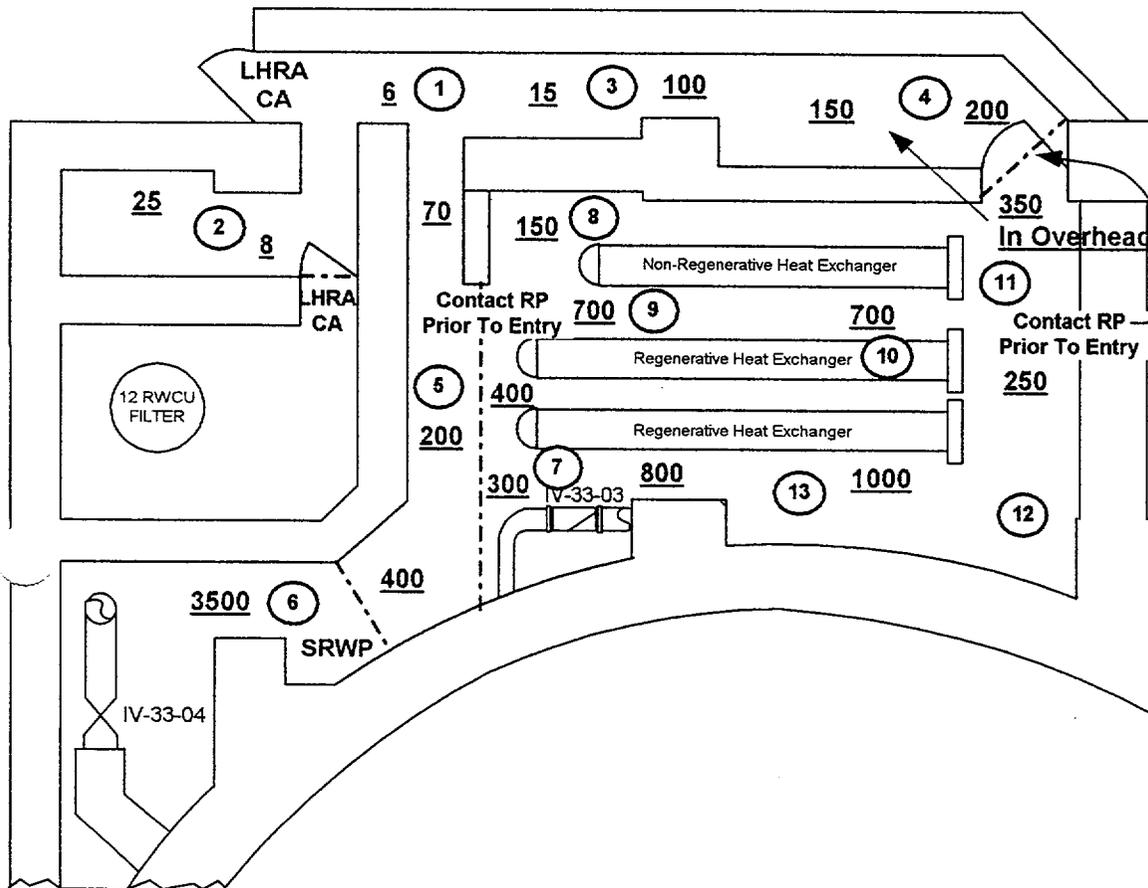
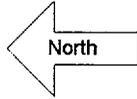
*Note: Specific RWP Required posting is not required to answer the question because it will be posted at the boundary to the area to get to IV-33-04 (near smear 6), not at the entrance to the area.*

**Technical Reference(s):**  
S-RAP-RPP-0103, 3.2.6, 3.2.8, 4.4, 4.7

|               |                    |
|---------------|--------------------|
| <b>K/A #:</b> | <b>Importance:</b> |
| 2.3.1, 2.3.4  |                    |

**Comments:**

**Reactor Building 261'  
RWCU Corridor & RWCU Heat Exchanger Room**



Survey No. **1 RB 24163**

Page **of**

Date/Time **6/25/99 1300**

RWP No. **LHRA Standing**

Rx Power **100%**

**Results**

| #  | Item           | $\beta\gamma$<br>dpm/100cm <sup>2</sup> | $\alpha$<br>dpm/100cm <sup>2</sup> |
|----|----------------|---|------------------------------------|
| 1  | Floor          | 6300                                    |                                    |
| 2  | Floor          | 31000                                   | <10                                |
| 3  | Floor          | 5100                                    |                                    |
| 4  | Floor          | 15000                                   | <10                                |
| 5  | Floor          | 12000                                   | <10                                |
| 6  | Floor          | 53000                                   | <10                                |
| 7  | Pipe           | 2100                                    |                                    |
| 8  | Floor          | 4000                                    |                                    |
| 9  | Floor          | 41000                                   | <10                                |
| 10 | Heat Exchanger | 900                                     |                                    |
| 11 | Floor          | 30000                                   | <10                                |
| 12 | Floor          | 23000                                   | <10                                |
| 13 | Heat Exchanger | 1200                                    | <10                                |
| 14 |                |   |                                    |
| 15 |                |   |                                    |
| 16 |                |   |                                    |
| 17 |                |   |                                    |
| 18 |                |   |                                    |
| 19 |                |   |                                    |
| 20 |                |   |                                    |
| 21 |                |   |                                    |
| 22 |                |   |                                    |
| 23 |                |   |                                    |
| 24 |                |   |                                    |
| 25 |                |   |                                    |
| 26 |                |   |                                    |
| 27 |                |   |                                    |
| 28 |                |   |                                    |
| 29 |                |   |                                    |
| 30 |                |   |                                    |
| 31 |                |   |                                    |

RO2 3105 9/16/99

BC4 884 8/4/99

SAC4 1247 9/2/99

- 1. — = Rope/Area Boundary
  - 2. (#) = Smear Location
  - 3. # = General Area Unless Noted
  - 4.  $\frac{\#}{\#} = \frac{\gamma}{\beta}$
  - 5.  $\Delta$  = Neutron (mRem/hr)
  - 6. A/S = Air Sample
  - 7.  $\nabla$  = Large Area Wipe
  - 8. A = Area Rad Monitor
  - 9. V # = VAMP Number
- $\gamma$  = Readings in mRem/hr.  $\beta$  = Readings in mRem/hr.

Remarks: **Cyclic Survey No Gen Area Beta Detected**

Surveyor: **See Original**

Dose:

Reviewed By: **See Original**

Date:

- 3.1.10 Evaluate the possibility of radiological posting being inadvertently knocked down, blocked or unnecessarily restricting access.
- 3.1.11 If deemed necessary, establish routine surveillances and/or monitoring devices (i.e., RM-16, VAMPS).
- NOTE:** Monitoring device alarm setpoint should be indicative of need for resurveying or reposting.
- 3.1.12 Document any posting changes, surveillances and additional monitoring controls on a survey log sheet. Ensure posting survey is representative of plant conditions.
- 3.1.13 Verify all radiological postings and controls are accurate.
- 3.1.14 Notify Radiation Protection supervision and chief technician as appropriate. A log entry should also be made.

### 3.2 Area Designations - Posting and Radiological Controls

Radiation Protection Technicians should use the following area designations and appropriate postings.

#### 3.2.1 Radiologically Controlled Area

Post access points to Radiologically Controlled Areas with a sign or signs bearing the words:

**CAUTION**

**RADIOLOGICALLY CONTROLLED AREA  
RADIOACTIVE MATERIALS  
RWP AND DOSIMETRY REQUIRED FOR ENTRY  
(IF Required for the Area)**

#### 3.2.2 Radiation Area

Post Radiation Areas as follows:

**CAUTION**

**RADIATION AREA**

#### 3.2.3 High Radiation Area

Post High Radiation Areas as follows:

**CAUTION or DANGER**

**HIGH RADIATION AREA**

3.2.4 Locked High Radiation Area

Post Locked High Radiation Areas as follows:

**CAUTION or DANGER**

**HIGH RADIATION AREA  
(Locked)**

3.2.5 Neutron Radiation Area

Post Neutron Radiation Areas as follows:

**CAUTION**

**Neutron Radiation Area  
Neutron Dosimetry Required for Entry  
(if required for the area)**

3.2.6 Very High Radiation Area

**GRAVE DANGER**

**VERY HIGH RADIATION AREA**

3.2.7 Airborne Radioactivity Area

Post Airborne Radioactivity Areas as follows:

**CAUTION or DANGER**

**Airborne Radioactivity Area**

3.2.8 Contaminated Area

Post Contaminated Areas as follows:

**CAUTION or DANGER**

**Contaminated Area**

- NOTES:**
1. Areas which have a high potential for contamination may be posted as a Contaminated Area and controlled accordingly.
  2. Contaminated work areas such as those used for chemical analysis, chemistry sample sinks, count room work area, etc., may be identified solely by yellow and magenta tape.

3.2.9 Hot Particle Area

- a. Post Hot Particle Areas as follows:

**CAUTION**

**Hot Particle Area  
Specific RWP Required for Entry**

- b. Establish identified Hot Particle Areas in accordance with S-RAP-RPP-0105, Hot Particle Controls.

3.2.10 Radioactive Materials Storage Area

Post Radioactive Materials Storage Areas as follows:

**CAUTION**

**RADIOACTIVE MATERIALS STORAGE AREA**

3.2.11 Hot Spot

Post each Hot Spot located in accessible areas with a label or sign as follows:

**CAUTION**

**Hot Spot**  
\_\_\_\_ mRem/hr @ contact  
\_\_\_\_ mRem/hr @ 30 cm.

3.2.12 Ladders

- a. Post ladders that access areas containing radiological hazard in the same manner as when posting the area.
- b. Provide information as to the location of the radiological hazard.
- c. Ensure the posting and/or barrier on the ladder does **NOT** become a personnel safety hazard when the ladder is used.
- d. Do **NOT** allow structures (e.g., ladders, scaffolding) to be left unattended near a Locked High Radiation Area that could allow access into the area by unauthorized personnel.
- e. Post ladders that access areas not routinely surveyed.

### 3.2.13 Labeling and Tagging Radioactive Materials

- a. Mark or tag containers or items of Radioactive Material, including source holders, "Caution Radioactive Material" and mark the contact dose rate when 5 mRem/hr or greater (uncorrected). Include other information necessary for safe handling.
- b. Tape or tag clear bags with yellow and magenta.

### 3.2.14 Additional Postings

Use additional postings as identified by the RP Technicians. Ensure these postings are self-explanatory, for example:

- a. No Entry
- b. Contact Radiation Protection for updated survey prior to entry
- c. Specific RWP Required
- d. Hands Off Inspection Only
- e. Dose Rate at this Point \_\_\_\_\_
- f. TLD Required.

### 3.2.15 Downposting of Areas

- a. Evaluate possible plant impact of radiological conditions in downposted area.
- b. Consider historical information from previous surveys, plant trends and monitoring equipment.
- c. If deemed necessary; establish routine surveillances and/or monitoring devices (i.e. RM-16, VAMPS).

**NOTE:** Monitoring device alarm set point should be indicative of need for resurveying or reporting

- d. Ensure downposting survey is representative of plant conditions.
- e. Verify all radiological postings and controls are accurate.
- f. Document any posting changes, surveillances and additional monitoring controls on a survey log sheet.
- g. Notify Radiation Protection supervision and chief technician as appropriate. A log entry should also be made.

3.2.16 Controls for Areas with Potentially Changing Radiological Conditions

- a. If deemed necessary; establish routine surveillances and/or monitoring devices (i.e. RM-16, VAMPS).

**NOTE:** Monitoring device alarm set point should be indicative of need for resurveying or reposting.

- b. Document any surveillances or additional monitoring controls on a Survey Log Sheet.
- c. Radiation Protection supervision and chief technician should be notified, as appropriate, of any established controls. A log entry should also be made.

3.3 Administrative Controls for the Unit One Turbine Bldg. 305' Green Area

At the discretion and approval of the Radiation Protection Supervisor and evaluation per NIP-SEV-01, under some circumstances, eating and drinking may be permitted inside the RCA with additional controls and increased monitoring. The following guidelines should be implemented when activating a Green Area.

3.3.1 Green Area Setup

- a. The Green Area shall have distinct boundaries and entrance will be via a step off pad.
- b. In accordance with an approved Material Storage Area Permit, this area may be equipped with items such as air conditioning, tables, chairs, refrigerator, microwave oven, telephones, gai-tronics and portable sanitary facilities.
- c. RCA tools/equipment should not be brought into this area.
- d. This area shall not be used to release tools and equipment from the RCA.
- e. The Green Area entrance should be posted as follows:

**GREEN AREA  
AUTHORIZED INDIVIDUALS ONLY  
ALL PERSONNEL MUST MONITOR PRIOR TO ENTRY**

- f. The Green Area exit should be posted as follows:

**NO FOOD OR DRINKS BEYOND THIS POINT**

### 3.3.2 Accessing the Green Area

- a. Since the Green Area is part of the RCA, personnel dosimetry (i.e., TLD, DD-100) and use of an RWP is required.
- b. Usually, individuals will enter the plant RCA at the beginning of shift at the normal access point and exit the RCA at the end of shift at the normal egress point using the RCA exit monitors to monitor for whole body contamination.
- c. Radiation/contamination personnel monitoring devices will be set up at the Green Area access step off pad for individuals to operate when entering. Personnel should monitor their hands, feet and face.
- d. Individuals may eat, drink and use sanitary facilities within the Green Area. Smoking shall not be allowed.

### 3.3.3 RCA Transfer of Personal Belongings

- a. Before entering the RCA, workers should put personal belongings (i.e., lunches, newspapers, candy, drinks etc.) into a designated cart that will be transported to the Green Area at pre-arranged times. Likewise, near the end of shift, carted items should be removed from the Green Area and transported to the RCA egress point.
- b. The individual moving the carted items through the RCA shall be instructed by Radiation Protection on transportation methods to prevent the contents from becoming contaminated.
- c. Items entering the Green Area should be restricted to those in the cart. Additional items entering this area should be limited and at RP's discretion with a proper survey.

### 3.3.4 Radiation Protection Oversight

- a. A Radiation Protection technician will be assigned to the Green Area continuously while it is in operation.
- b. Radiation protection will perform an initial detailed radiation/contamination survey to activate the area and therefore, perform periodic area surveys at the frequency set forth by RP Supervision. The RP Chief technician and RP Supervisor must be notified if the Green Area dose rates are  $\geq 0.2$  mR/hr and smearable levels are  $\geq 100$  dpm/100 cm<sup>2</sup>.
- c. Radiation Protection should evaluate the radiological impact of nearby Material Storage Areas and any incoming radioactive material to these areas which might alter the Green Area background.

### 3.3.4 (Cont)

- d. Radiation Protection should observe and assist workers with personal monitoring prior to entering the Green Area.
- e. Surveying the transport cart for RCA release should be performed per station procedure with the inside of the cart being surveyed at least once per shift when in use to ensure radiological cleanliness. Personal belongings inside the cart may be transferred to and from the Green Area without being surveyed.

## 4.0 DEFINITIONS

### 4.1 Accessible

Floor level up to approximately 6 feet and permanently installed platforms capable of being reached by a portion of the whole body. Does not include overhead areas that require climbing on plant structures or the use of portable ladders, scaffolding, etc.

### 4.2 Airborne Radioactivity Area

A room, enclosure, or area in which airborne radioactive materials, composed wholly or partly of licensed material, exist in concentrations:

- a. In excess of the derived air concentrations (DACs) specified in Appendix B, to §§ 20.1001 - 20.2401, or
- b. To such a degree that an individual present in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of 0.6 percent of the annual limit on intake (ALI) or 12 DAC hours.

### 4.3 Boundary

A means of limiting access by use of ropes, step-off-pads, tape, and other physical structures used to border a radiologically controlled area. The vertical planes formed by rope or other structures should define the area of control unless otherwise specified by RP Supervision.

### 4.4 Contaminated Area

Areas accessible to personnel where surface contamination exceeds:

- 4.4.1 400 dpm/100 cm<sup>2</sup> removable beta-gamma; OR
- 4.4.2 20 dpm/100 cm<sup>2</sup> removable alpha.

**4.5 Deep Dose Equivalent**

The dose equivalent at a tissue depth of 1 cm which applies to external whole body exposure.

**4.6 Hands Off Inspection**

Inspections conducted in radiologically controlled areas limiting physical contact with plant components and structures to that necessary to maintain individual safety (e.g., hand rails, railings).

**4.7 Locked High Radiation Area**

An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 1000 mrem in one hour at 30 cm from the radiation source or from any surface that the radiation penetrates.

**4.8 High Radiation Area**

An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 100 mrem in one hour at 30 cm from the radiation source or from any surface that the radiation penetrates.

**4.9 Hot Particle Area**

Work area within the RCA where hot particles have been identified.

**4.10 Hot Spot**

A locally intense source of radiation in which whole body exposure is greater than 25 mRem/hr at 30 cm and exceeds general area radiation levels by a factor of 5.

**4.11 Derived Air Concentration**

The concentration of a given radionuclide in air which, if breathed by the reference man for a working year of 2,000 hours under conditions of light work (inhalation rate 1.2 cubic meters of air per hour), results in an intake of one Annual Limit of Intake (ALI). DAC values are given in Table 1, Column 3, of appendix B to §§ 20.1001 - 20.2401.

**4.12 Neutron Radiation Area**

Areas accessible to personnel in which there exists neutron radiation at levels such that a major portion of the body could receive a neutron dose equivalent in excess of 2 mrem in one hour.

**4.13 Posted Area**

Room, area, component, etc., that has a sign bearing the radiation caution symbol and a warning of the radiological conditions in the room or area.

#### 4.14 Radiation Area

Areas accessible to individuals in which there exists radiation at such levels that an individual could receive a dose equivalent in excess of 5 mrem in any one hour at 30 cm from the radiation source or from any surface that the radiation penetrates.

#### 4.15 Radioactive Material

For the purposes of tagging or labeling items or containers, radioactive materials are:

- 4.15.1 Any item or liquid removed from a contaminated area or system until sampled or surveyed by Radiation Protection personnel or other designated qualified individual.
- 4.15.2 Material inside the RCA that exceeds 18000 cpm/15 cm<sup>2</sup> (5 mRad/hr) fixed contamination or removable contamination in excess of 400 dpm/100 cm<sup>2</sup> beta-gamma or 20 dpm/100 cm<sup>2</sup> alpha.
- 4.15.3 Material (other than natural uranium or thorium) determined by Radiation Protection to exceed the applicable quantities listed in 10CFR20 Appendix C.
- 4.15.4 Material consisting only of natural uranium or thorium determined by Radiation Protection to exceed 10 times the applicable quantities listed in 10CFR20 Appendix C.
- 4.15.5 Any liquid determined to exceed the applicable concentrations listed in 10CFR20, Appendix B.
- 4.15.6 Material for release from the RCA determined by Radiation Protection to exceed the applicable quantities listed in 10CFR20 or as per requirements of S-RPIP-3.3.

#### 4.16 Radioactive Material Storage Area

Areas designated for storage of radioactive materials in accordance with GAP-INV-02, Control of Material Storage Areas which:

- 4.16.1 Contain Radioactive Material that exceeds Restricted Area Control Limits of 18000 cpm/15 cm<sup>2</sup> fixed contamination or removable contamination of 400 dpm/100 cm<sup>2</sup> beta-gamma or 20 dpm/100 cm<sup>2</sup> alpha.
- 4.16.2 Contain Radioactive Materials in excess of 10 times (or natural uranium or thorium in excess of 100 times) the quantity of materials specified in 10CFR20, Appendix C, or 12 NYCRR, Table 7.

#### 4.17 Radiologically Controlled Area (RCA)

Major plant areas access to which is limited for the purpose of protecting personnel from exposure to radiation and contamination. Examples include the Reactor, Turbine, Radwaste and Offgas Buildings.

Other radiologically controlled areas may be established with protective requirements specified by RP Supervision. Examples might include Radioactive Material Storage Areas at the warehouse or elsewhere on site.

#### 4.18 Temporary Shielding

Any material authorized by the RP Supervisor or Designee to reduce beta, gamma or neutron exposure.

#### 4.19 Very High Radiation Area

Areas accessible to personnel in which radiation levels could result in an individual(s) receiving an absorbed dose in excess of 500 rads in one hour at one meter from the source or any surface that the radiation penetrates.

Potential VHRA include, but are not limited to:

- TIP Rooms
- Upper Elevations of the Drywell during fuel moves
- Spent Fuel Pool during diving operations

#### 4.20 Whole Body

Head, trunk (including male gonads), arms above the elbows, or legs above the knee.

#### 4.21 Green Area

A low dose clean area, normally  $<0.2$  mRem/hr and  $\leq 100$  dpm/100 cm<sup>2</sup> smearable, temporarily set up within the RCA to facilitate on going work.

#### 4.22 Ready for Transport

When a package/vehicle is properly packaged, labeled, marked and placarded in accordance with all applicable regulations, shipping papers are in possession of the driver or attached to the package, and the carrier has taken possession of the package/vehicle.

POA3

| Nine Mile Point 1<br>Category "A" - Examination Outline Cross Reference |                                    |
|---|------------------------------------|
| Operating Test Number   | Cat "A" Test: 1                    |
| Examination Level   | RO                                 |
| Administrative Topic  | A.3                                |
| Subject Description:  | Radiological Procedures & Controls |
| Question Number:  | 2                                  |

**Question:**

You are required to enter the drywell to check freeze seals; this is your first drywell entry during this outage.

Radiation Protection directs you to sign on and use RWP 507, DW VLV REPACKS, FREEZE SEALS AND ASSOCIATED WORK. The RWP is attached.

Determine the requirements and restrictions that apply to YOU prior to and during the drywell entry.

**Answer:**

**Prior to entering the drywell:**

- Briefs: ALARA brief, pre-job brief by shift management, pre-job brief by RP
- Protective Clothing: Cap, Hood, Cotton Liners, Rubber Gloves (1), Cotton Boots (1), Rubbers, Scrub Suit, Coveralls (1), TLD, Electronic Dosimeter, Finger Ring

*Note: The Gore-Tex suit is only required for wet work. Double rubber gloves and a face shield are not required. If the candidate states a finger ring is not required, then clarify how this determination was made since RP approval is required first.*

**While in the drywell:**

- Stay to outer wall until at location to inspect the freeze seal.
- Leave the area if an area radiation monitor or electronic dosimeter alarms.
- Notify RP if an area radiation monitor or electronic dosimeter alarms.

**Technical Reference(s):**

GAP-RPP-02

**K/A #:**

2.3.1, 2.3.10

**Importance:**

**Comments:**

**Radiation Work Permit: 507****DW VLV REPACKS, FREEZE SEALS AND ASSOCIATED WORK****Survey Data:**

1-DW-5885,5883,5875,5884, GA survey  
 DW-315 4 to 20 mREM/hr  
     20,000 dpm/100cm<sup>2</sup> smearable  
 DW-295 & 305 20 to 100mREM/hr GA  
     10,000 dpm/100cm<sup>2</sup> smearable  
 DW-295 CS nozzle 600(contact) & 300(30cm) mREM/hr (each nozzle is different)  
 DW-259 10 to 60 mREM/hr outer walls  
     100 to 200 mREM/hr near recirc risers  
     600(contact) & 300(30cm) m REM/hr at cleanup snake line  
     5,000 dpm/100 cm<sup>2</sup> smearable  
 DW-237 10 to 25 mREM/hr at hatch  
     50 to 60 mREM/hr @ railroad tracks  
     300(contact) & 250(30cm) mREM/hr at recirc risers  
     20,000 dpm/100cm<sup>2</sup> smearable  
 DW-225 14 to 20 mREM/hr under vessel & dog houses  
     300 (contact) & 250 (30cm) mREM/hr pump bowls  
     8 (mRAD/hr)/100cm<sup>2</sup> smearable

---

**DW Valve Repacks, Freeze Seals, and Associated Work.****DD-100 @ 400/800**

TASK: 1 High Radiation Area

**Protective Clothing Requirements:** PC Set Name - not designated

Cap, Hood, Face Shield, Cotton Liners, Rubber Gloves (1), Cotton Boots (1), Rubbers (1)  
 Scrub Suit, Coveralls (1), Gore-Tex Outer PC, Plastic Apron, TLD, Electronic Dosimeter (0,0,0,400,800,960), Finger Rings  
 Radiation Protection Tech. may change protective clothing, respirator, or other requirements as work locations and conditions change.  
 Double rubber gloves required for handling used packing material  
 Gore-tex suit req'd for wet work  
 Plastic apron req'd for pulling packing without a gore-tex suit  
 Face shield required while pulling packing

**Instructions:**

Unit 1 Drywell primary radiation source is Recirc sys piping. Stay to outer wall, low dose area.  
 Leave area if radiation monitor or dosimeter alarms and contact Radiation Protection  
 Keep Radiation Protection informed of work methods.  
 Survey Required at System Breach.  
 Pre job brief at entrance to Drywell  
 Alara briefing required prior to initial RWP use (Alara Review 99-03)  
 Use wet rag to wipe stem for inspection  
 Keep packing wet during packing pull, catch contain. req'd for water overflow.

**ALARA Review Number:**

NIAGARA MOHAWK POWER CORPORATION  
NINE MILE POINT NUCLEAR STATION  
GENERATION ADMINISTRATIVE PROCEDURE

GAP-RPP-02

REVISION 05

RADIATION WORK PERMIT

TECHNICAL SPECIFICATION REQUIRED

Approved by:  
R. G. Smith

R. G. Smith  
Plant Manager - Unit 1

2/2/99  
Date

Approved by:  
N. C. Paleologos

N. C. Paleologos  
Plant Manager - Unit 2

2-3-99  
Date

THIS IS A FULL REVISION

Effective Date: 02/11/99

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## 1.0 PURPOSE

To establish the administrative controls for initiation, preparation, and use of Radiation Work Permits (RWP) at Nine Mile Point Nuclear Station.

### Applicability

This procedure applies to personnel entering a Nine Mile Point Radiologically Controlled Area (RCA).

## 2.0 PRIMARY RESPONSIBILITIES

- 2.1 Manager Radiation Protection is responsible for implementation of the Radiation Work Permit (RWP) Program.
- 2.2 Radiation Protection (RP) Supervision is responsible for implementation of Radiation Protection activities necessary to support the requirements of the RWP Program.
- 2.3 Department Supervisors are responsible to ensure:
  - (C1) 2.3.1 Personnel are properly trained and qualified to work in areas controlled by RWPs.
  - 2.3.2 Personnel are briefed, as necessary, concerning job and related ALARA/RP requirements before the start of work.
  - 2.3.3 The RP Branch is informed of changes in work scope.
  - 2.3.4 Housekeeping standards are restored in the work area after job completion, as directed by GAP-HSC-01.
- 2.4 Radiation Protection Technicians are responsible to provide job coverage based on the radiological conditions and nature of the task and to stop work when radiological conditions warrant.
- 2.5 Radiation Workers are responsible to comply with the requirements of the RWP Program.

## 3.0 PROCEDURE

(C2)

**NOTE:** RWP Log entries or RWP requests may be made either on paper or electronic media.

### 3.1 Types of Radiation Work Permits

- 3.1.1 A Radiation Work Permit should be required for entries into a radiologically controlled area (RCA). Certain areas, such as those established solely for the purpose of radioactive material storage, may be excluded (based upon radiological

### 3.1.1 (Cont)

conditions) from the RWP requirement with RP supervision approval. There are three types of RWPs:

- a. **General RWP** - For personnel access to RCA for general tours, supervisory oversight, inspections, or RP approved work in areas not posted as a Radiation Area or Contaminated Area.
- b. **Standing RWP** - For routine or repetitive work functions.
- c. **Specific RWP** - For performance of a job in locations where the work may affect or change the radiological conditions and any work, or any other condition beyond the scope of a Standing RWP, as determined by RP.

3.1.2 Depending on the planned scope of work, qualifications of personnel performing the work, and radiological conditions of the work area, RP may specify the use of a General, Standing or Specific RWP.

### 3.2 Emergency Response Radiation Work Permit

3.2.1 To prevent delays during an emergency, RWP processing may be modified as directed by the Station Shift Supervisor (SSS) or Supervisor RP Operations, or designee, provided:

- a. Required work is continuously monitored by RP technicians.
- b. At the conclusion of the emergency condition, a RWP, Radiation Survey Log Sheet(s), RWP Sign-In Logs, and other documentation are initiated and processed.
- c. A post-job ALARA review is issued per GAP-ALA-01 to evaluate actions taken and resultant personnel exposure.
- d. Generation of a DER to document the event is considered.

### 3.3 Use of General Radiation Work Permit

3.3.1 Personnel shall adhere to the following limitations for General RWPs:

- a. Access to posted Radiation Areas is permitted for passage and short duration inspection/observation activities only. Loitering is prohibited.
- b. Entry into areas requiring a specific RWP is prohibited without signing or logging in on an appropriate specific RWP.
- c. The daily exposure guide specified on the RWP shall not be exceeded.

3.3.1 (Cont)

d. RP shall approve work that requires stay time in non-radiation areas and non-contaminated areas of the RCA.

3.3.2 For each entry into the RCA, personnel shall record entry using either the General RWP Log (Attachment 4) or electronic media.

3.3.3 Upon exiting the RCA, personnel should complete log entries using either the General RWP Log or electronic media. Personnel that also signed in on a Specific RWP during their entry shall record an asterisk (\*) instead of an exit dose on the General RWP Log unless entry/exit has been recorded electronically.

3.4 Use of a Standing Radiation Work Permit

3.4.1 Personnel shall read and adhere to the Standing RWP.

3.4.2 Personnel shall record RCA entry and exit using either the Standing RWP Log (Attachment 5) or electronic media at the frequency prescribed by the Standing RWP. Personnel that also signed in on a specific RWP during their entry record an asterisk (\*) instead of an exit dose on the Standing RWP Log unless entry/exit has been recorded electronically.

3.4.3 The Supervisor RP Operations ensure review of Standing RWPs at least annually.

3.5 Initiation of a Specific Radiation Work Permit

3.5.1 RP shall require the use of a Specific RWP when radiological conditions meet one or more of the following criteria, unless specifically allowed by a Standing RWP:

- High Radiation Area or Locked High Radiation Area
- Very High Radiation Area
- Airborne Radioactivity Area
- Neutron Radiation Area
- Contaminated Area
- Maintenance in Radiation Area
- Use of a vacuum cleaner in areas with contamination greater than 10,000 dpm/100cm<sup>2</sup>
- Activities beyond the scope of a General or Standing RWP.

3.5.2 The requestor or planner should submit a completed RWP Request, or provide equivalent information for computer entry in the "Planning" tab of RWP, to the ALARA/RP Planner or Chief Technician IF Planner not available. The "Planning" tab, in RWP, is equivalent to the RWP Request Form.

### 3.6 Preparation of a Specific Radiation Work Permit

3.6.1 Based on the RWP Request, the RWP Preparer should prepare a RWP (Attachment 2) and associated documents to provide:

- a. Date and time of issue and termination.
- b. Prescribed RP controls per Branch Administrative procedures
- c. Special instructions for keeping dose ALARA during job performance
- d. When practical, special instructions for minimizing radioactive waste generation
- e. Specific RWP Log or equivalent when used (Attachment 3)
- f. A formal ALARA Review, if required per GAP-ALA-01.

3.6.2 The RWP Preparer shall obtain RP supervisory approval when a specific RWP is written for:

- a. Personnel entry into known or potential Very High Radiation Areas (for example; TIP Rooms); SSS approval is required for entry into a Very High Radiation Areas.
- b. Work in areas with a dose rate >2500 mRem/hr whole body.

### 3.7 Use of a Specific Radiation Work Permit

3.7.1 Before starting work, the job contact or work group supervisor or designee should ensure the RWP is applicable to the planned work and:

- a. Become familiar with the expected dose rates, contamination levels, and established radiological controls associated with protective clothing, respiratory protection, job coverage, and dosimetry
- b. Review RWP with a RP Chief Technician, or designee
- c. When specified, ensure pre-job ALARA RWP requirements, such as pre-job meetings or mock-up training, are completed
- d. If the activity is within a Very High Radiation Area, obtain permission before any entry to the area from:
  1. Supervisor RP Operations; AND
  2. Station Shift Supervisor (SSS)

- 3.7.2 Radiation Workers using a Specific RWP shall review the RWP before entry and obtain clarification, as necessary, to ensure requirements are understood.
- 3.7.3 Radiation Workers should perform work such that the exposure guides/limits will NOT be exceeded based on dose rates in the work area and expected man-hours to complete the work.
  - a. Known or suspected changes in radiological conditions shall be reported to Radiation Protection Chief.
  - b. Stop work orders given by RP technicians shall be obeyed.
- 3.7.4 Workers shall access the RCA using either the General, Standing or Specific RWP as specified by Radiation Protection during pre-job briefings, unless otherwise specified by RP Supervision.
- 3.7.5 Radiation Workers shall complete applicable sections of the Specific RWP Log (Attachment 3) when required by RP.
  - a. If dosimetry requirements change during the course of a job (such as addition of finger rings or new TLD), personnel shall sign-in on a new line of the RWP Sign-In Sheet when used.
  - b. Indicate use of respiratory equipment.

### 3.8 Closing of a Radiation Work Permit

- 3.8.1 For Specific RWPs the responsible Supervisor, or designee should:
  - a. Ensure the work area is cleaned and decontaminated, as necessary, to restore the area to established housekeeping standards per GAP-HSC-01, Station Housekeeping and Inspections
  - b. Inform the RP Chief Technician or job technician that the job is complete
- 3.8.2 Radiation Protection Technicians should:
  - a. Perform a post-job survey of the work area as appropriate before closing the RWP to determine if additional housekeeping or decontamination is necessary
  - b. If additional housekeeping or decontamination is necessary, inform the responsible supervisor and RP supervision.

#### 4.0 DEFINITIONS

- 4.1 ALARA - An acronym representing the policy to keep radiation exposure As Low As is Reasonably Achievable.
- 4.2 Electronic Dosimetry - Personnel dosimetry that alarms when either a preset integrated exposure or a preset exposure rate is reached.
- 4.3 Formal ALARA Review - A detailed, systematic radiological review performed by the ALARA group. This review includes scope of work, potential internal and external dose, and protective measures to reduce individual and/or group exposures.
- 4.4 Inspection - Observations which limit physical contact of plant components and structures to that necessary to maintain personal safety (e.g., hand rails, ladders, railings).
- 4.5 Job Contact - Person responsible for providing assistance to the Radiation Protection (RP) Department for the processing and closeout of department Radiation Work Permits (RWP).
- 4.6 Radiation Work Permit (RWP) - A document used to inform workers of Radiation Protection requirements and radiological conditions in work areas to minimize personnel exposure to radiation and radioactive material.
- 4.7 Radiation Work Permit Request - A mechanism for requesting/notifying the Radiation Protection Department and the ALARA Group of upcoming work and terminating the Radiation Work Permit.
- 4.8 Radiologically Controlled Area (RCA) - An area to which access is controlled for the purpose of limiting personnel exposure to radiation and radioactive material.
- 4.9 Self Reading Dosimeters - Personnel dosimetry that can be read anytime by the user to determine accumulated exposure.
- 4.10 Very High Radiation Area - Areas accessible to personnel in which radiation levels could result in an individual receiving an absorbed dose in excess of 500 rads in 1 hour at 1 meter from the source.

## 5.0 REFERENCES AND COMMITMENTS ::

### 5.1 Licensee Documentation

Unit 1 and 2 Technical Specifications, Section 6.11, Radiation Protection Program, Section 6.12, High Radiation Area

### 5.2 Standards, Regulations, and Codes

- 5.2.1 10CFR19, Notices, Instructions and Reports to Workers: Inspection and Investigations
- 5.2.2 10CFR20, Standards for Protection Against Radiation
- 5.2.3 INPO 91-014, Guidelines for Radiological Protection at Nuclear Power Stations, Chapter VIII

### 5.3 Policies, Programs, and Procedures

- 5.3.1 NDD-RPP, Radiation Protection Program
- 5.3.2 GAP-RPP-01, Radiation Protection Program
- 5.3.3 GAP-ALA-01, Site ALARA Program
- 5.3.4 GAP-HSC-01, Housekeeping, Tours, and Inspections
- 5.3.5 GAP-RPP-08, Control of High, Locked High, and Very High Radiation Areas

### 5.4 Commitments

| <u>Sequence Number</u> | <u>Commitment Number</u> | <u>Description</u>  |
|------------------------|--------------------------|---|
| 1                      | NCTS<br>700156-01        | RWP responsibilities clearly identified for workers and supervisors.              |
| 2                      | SOER<br>85-3             | Covers the purpose, contents, and requirements for issuing a RWP.                 |
| 3                      | NCTS<br>700155-01        | Radiation Protection Supervision approval for all high accumulated exposure jobs. |

6.0 RECORDS REVIEW AND DISPOSITION

6.1 The following records generated by this procedure shall be maintained by Records Management for the Permanent Plant File in accordance with NIP-RMG-01, Records Management:

- Radiation Work Permits (RWPs)
- Radiological Surveys
- Specific, General, and Standing RWP Logs
- ALARA Reviews/Check Lists

6.2 The following records generated by this procedure are not required for retention in the Permanent Plant File:

- RWP Request

LAST PAGE

POA4

Initial Conditions:

1. The unit is in a refueling outage with fuel movements in progress.
2. The SRO on the refueling bridge notifies you that during turnover, the off going grapple operator slipped when climbing from the refueling bridge and fell about 3 feet to the floor. The worker has a compound fracture of his right leg. The worker also struck his head and there is bleeding from his head. The worker is unconscious.

Initiating cue:

Perform the CSO actions for this event.

NIAGARA MOHAWK POWER CORPORATION  
OPERATOR JOB PERFORMANCE MEASURE

Title: Medical Emergency (CSO Actions)  
Contaminated Injured Worker Requiring Transport To Oswego Hospital

Revision: 0

Task Number:

Approvals:

\_\_\_\_\_  
General Supervisor                      Date  
Operations Training (Designee)

\_\_\_\_\_  
General Supervisor                      Date  
Operations (Designee)

\_\_\_\_\_  
Configuration Control                      Date

Performer: \_\_\_\_\_ (RO)

Trainer/Evaluator: \_\_\_\_\_

Evaluation Method: \_\_\_\_\_ Perform                       Simulate

Evaluation Location: \_\_\_\_\_ Plant                       Simulator

Expected Completion Time: 20 minutes      Time Critical Task: NO                      Alternate Path Task: NO

Start Time: \_\_\_\_\_                      Stop Time: \_\_\_\_\_                      Completion Time: \_\_\_\_\_

JPM Overall Rating:                      Pass                      Fail

NOTE: A JPM overall rating of fail shall be given if any critical step is graded as fail. Any grade of unsat or individual competency area unsat requires a comment.

Comments:

Evaluator Signature: \_\_\_\_\_

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

Recommended Start Location: (Completion time based on the start location)

Plant Control Room, Simulator or other designated area.

Simulator Set-up:

N/A

Directions to the Instructor/Evaluator:

Prior to performance of this JPM, obtain SSS / CSO general permission to open equipment cabinets and inspection covers. If opening the equipment cabinet or inspection cover will affect Tech. Spec. Operability, operational status, or the effects are unknown, obtain specific SSS / CSO permission.

Directions to Operators:

Read Before Every JPM Performance:

For the performance of this JPM, I will function as the SSS, CSO, and Auxiliary Operators. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary.

Read Before Each Evaluated JPM Performance:

This evaluated JPM is a measure of your ability to perform this task independently. The Control Room Supervisor has determined that a verifier is not available and that additional / concurrent verification will not be provided; therefore it should not be requested.

Read Before Each Training JPM Performance:

During this Training JPM, applicable methods of verification are expected to be used. Therefore, either another individual or I will act as the additional / concurrent verifier.

Notes to Instructor / Evaluator:

1. Critical steps are identified as **Pass/Fail**. All steps are sequenced critical unless denoted by a "•".
2. During Evaluated JPM:
  - Self-verification shall be demonstrated.
3. During Training JPM:
  - Self-verification shall be demonstrated.
  - No other verification shall be demonstrated.

References:

1. EPIP-EPP-04, Rev 04
2. NUREG  
K/A 2.4.39 (3.3)

Tools and Equipment:

1. None

Task Standard:

Performs the CSO actions of EPIP-EPP-04 including the CSO checklist for a medical emergency in response to a contaminated injured worker who requires medical attention and transport to a medical facility.

Initial Conditions:

1. The unit is in a refueling outage with fuel movements in progress.
2. The SRO on the refueling bridge notifies you that during turnover, the off going grapple operator slipped when climbing from the refueling bridge and fell about 3 feet to the floor. The worker has a compound fracture of his right leg. The worker also struck his head and there is bleeding from his head. The worker is unconscious.

Initiating cue:

“(Operator’s name), perform the CSO actions for this event.

| Performance Steps   | Standard   | Grade     | Comments   |
|---|--|-----------|--|
| 1. Provide repeat back of initiating cue.<br><i>Evaluator Acknowledge repeat back providing correction if necessary</i> | Proper communications used for repeat back (GAP-OPS-01)                | Sat/Unsat |  |
| <b>RECORD START TIME _____</b>  |  |           |  |
| 2. Obtain a copy of the reference procedure and review/utilize the correct section.                                     | EPIP-EPP-04 obtained.<br><br>Section 3.1 and CSO Checklist referenced. | Sat/Unsat |  |
| 3. •Notify the Fire Brigade and request response.   | Fire Brigade notified and directed to go to the scene.                 | Pass/Fail | <p><b>Cue: After Fire Brigade response is requested, report as Fire Brigade Leader (FBL) that the Fire Brigade is at the scene. Report that the worker is contaminated and that RP is needed. Request CSO obtain an ambulance, medical assistance and have the hospital setup the Radiation Emergency Area (REA).</b></p> <p><b>Note: Telephone, radio, or GAItronics may be used.</b></p> |

| <i>Performance Steps</i>  | <i>Standard</i>   | <i>Grade</i>     | <i>Comments</i> |
|---|---|------------------|-----------------|
| 4. •Notify the SSS.<br><br><b>Cue: Acknowledge as SSS.</b>  | SSS notified.   | Sat/Unsat        |                 |
| 5. •Initiate the CSO checklist<br>(Attachment 1)  | Record date, notified by, and location.<br><br>Record notification of Fire Brigade and SSS.<br><br>Indicate Unit 1.   | Sat/Unsat        |                 |
| 5a. •Contact RP and request RP report<br>to the scene.<br><br><b>Cue: Acknowledge as RP that you<br/>will dispatch RP techs. to the<br/>Refuel Floor.</b> | RP contacted and directed to go to the scene,<br>step checked on CSO Checklist.   | <b>Pass/Fail</b> |                 |
| 5b •Contact Oswego 911.<br><br><b>Cue: role-play as 911 operator in<br/>response to NMP1 requests.</b>  | Using dial phone at RO desk call Oswego<br>911 and request an ambulance be sent to<br>NMP 2 Security Access.  | <b>Pass/Fail</b> |                 |
| 5c •Contact Site Security Supervisor<br>and request a security force member<br>to the scene.<br><br><b>Cue: role-play as security.</b>                    | Site Security Supervisor contacted using<br>radio, GAItronics or telephone:<br>- Security requested to the scene.<br>- Notified of ambulance arriving at NMP2<br>Security Access. | Sat/Unsat        |                 |

| Performance Steps   | Standard  | Grade                   | Comments  |
|---|---|-------------------------|---|
| <p>5d. •Contact Oswego hospital at 349-5522.</p> <p><b>Cue: role-play as Oswego hospital.</b></p> <ul style="list-style-type: none"> <li>- Request status of the injured person.</li> <li>- Request NMP1 RP accompany the patient to the hospital.</li> </ul> | <p>Calls Oswego hospital using the dial phone. Informs them 1 patient is being sent, the patient has a compound fracture of the right leg, has struck his head and is unconscious and bleeding from the head</p> <p>Request setup of REA.</p> | <p><b>Pass/Fail</b></p> | <div style="border: 1px solid black; height: 150px;"></div> |
| <p>5e. •Medical Department assistance is required.</p> <p><b>Cue: Acknowledge as medical department.</b></p>  | <p>Medical Department contacted.</p> <p><b>Note: Telephone, radio, or GAItronics may be used.</b></p>   | <p>Sat/Unsat</p>        | <div style="border: 1px solid black; height: 100px;"></div> |
| <p>5f. •Notify Security of impending arrival of Site Medical Staff.</p> <p><b>Cue: Acknowledge as security.</b></p>   | <p>Security notified.</p>   | <p>Sat/Unsat</p>        | <div style="border: 1px solid black; height: 80px;"></div>  |
| <p>5g. •Request the SSS contact RP on-call supervisor and request that RP Supervision and an RP Technician report to the Oswego hospital.</p> <p><b>Cue: Acknowledge as SSS.</b></p> <p><b>Cue: Inform CSO that RP on-call Supervisor is notified.</b></p>    | <p>SSS informed of need to notify RP Supervisor.</p>  | <p>Sat/Unsat</p>        | <div style="border: 1px solid black; height: 150px;"></div> |
| <p>5h. •Direct Site Security Supervisor to contact Manager, Nuclear Communications and Public Affairs and provide details of the incident.</p>  | <p>Site Security Supervisor directed to provide details of the incident to the Manager, Nuclear Communications and Public Affairs.</p>  | <p>Sat/Unsat</p>        | <div style="border: 1px solid black; height: 80px;"></div>  |

| <i>Performance Steps</i>   | <i>Standard</i>                           | <i>Grade</i> | <i>Comments</i> |
|--|---|--------------|-----------------|
| <b>Cue: role-play as Site Security Supervisor.</b>   |   |              |                 |
| 5i. •When the patient has left the site<br>OR when the FB Leader reports the emergency is terminated, then inform the SSS. | SSS notified the emergency is terminated. | Sat/Unsat    |                 |
| <b>Cue: Report as FB Leader the worker is in the ambulance with an RP and the ambulance has left the protected area.</b>   |   |              |                 |

End of JPM

**TERMINATING CUE:** Completes CSO checklist and reports to SSS emergency is terminated.

**RECORD STOP TIME** \_\_\_\_\_