SRO A1

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

**Question:**

During five loop operation at 96% power a core performance edit (3-D Monicore) indicates Core Maximum Fraction of Limiting Power Density (CMFLPD) is 0.98. Who must be notified and what options are available?

**Answer:**

(1) The power distribution must be changed to lower CMFLPD to less than FRTP.
***OR***
(2) APRM gain must be adjusted per TS 2.1.2.a.
***OR***
(3) APRM scram and rod block settings must be reduced to the values specified in TS 2.1.2.a (settings are reduced by a factor of .96/.98).

Notify the Reactor Engineer.

*Note to the examiner: The adjustment of the APRM gains is asked in question #2 (A.1. parameter verification, Q.2).*

| Technical Reference(s): |
|---|
| N1-REP-12, T.S. 3.1.7, 2.1.2, 3.6.2.b |

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

**Comments:**

| SAFETY LIMIT | LIMITING SAFETY SYSTEM SETTING |
|---|---|
| 2.1.1 FUEL CLADDING INTEGRITY | 2.1.2 FUEL CLADDING INTEGRITY |
| Applicability: | Applicability: |
| Applies to the interrelated variables associated with fuel thermal behavior. | Applies to trip settings on automatic protective devices related to variables on which the fuel loading safety limits have been placed. |
| Objective: | Objective: |
| To establish limits on the important thermal-hydraulic variables to assure the integrity of the fuel cladding. | To provide automatic corrective action to prevent exceeding the fuel cladding safety limits. |
| Specification: | Specification: |
| a. When the reactor pressure is greater than 800 psia and the core flow is greater than 10%, the existence of a Minimum Critical Power Ratio (MCPR) less than the Safety Limit Critical Power Ratio (SLCPR) (Reference 12) shall constitute violation of the fuel cladding integrity safety limit. | Fuel cladding limiting safety system settings shall be as follows: |
| b. When the reactor pressure is less than or equal to 800 psia or core flow is less than 10% of rated, the core power shall not exceed 25% of rated thermal power. | a. The flow biased APRM scram and rod block trip setting shall be established according to the following relationships:<br>$S \leq (0.55W + 65\%)T$ with a maximum value of 120%<br>$S_{RB} \leq (0.55W + 55\%)T$ with a maximum value of 110%<br>WHERE:<br>S or $S_{RB}$ = The respective scram or rod block setpoint<br>W = Loop Recirculation Flow as a percentage of the loop recirculation flow which produces a rated core flow of 67.5 MLB/HR |

| SAFETY LIMIT | LIMITING SAFETY SYSTEM SETTING |
|---|---|
| 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.<br><br>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. | T = FRTP/CMFLPD (T is applied only if less than or equal to 1.0)<br>FRTP = Fraction of Rated Thermal Power where Rated Thermal Power equals 1850 MW<br>CMFLPD = Core Maximum Fraction of Limiting Power Density<br><br>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. |
| 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. | b. The IRM scram trip setting shall not exceed 12% of rated neutron flux for IRM range 9 or lower. \|<br><br>The IRM scram trip setting shall not exceed 38.4% of rated neutron flux for IRM range 10. \| |
| 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-low level setpoint redundant instrumentation will be provided to monitor the reactor water level. | c. The reactor high pressure scram trip setting shall be $\leq$ 1080 psig.<br><br>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"). |

| LIMITING CONDITION FOR OPERATION | SURVEILLANCE REQUIREMENT |
| --- | --- |
| b. During operation with the Core Maximum Fraction of Limiting Power Density (CMFLPD) greater than the Fraction of Rated Thermal Power (FRTP), either:<br><br>(1) The APRM scram and rod block settings shall be reduced to the values given by the equations in Specification 2.1.2a; or<br><br>(2) The APRM gain shall be adjusted in accordance with Specification 2.1.2a; or<br><br>(3) The power distribution shall be changed such that the CMFLPD no longer exceeds FRTP. | c. During reactor power operation at ≥ 25 percent rated thermal power, the Core Maximum Fraction of Limiting Power Density (CMFLPD) shall be checked daily and the flow-referenced APRM scram and rod block signals shall be adjusted, if necessary, as specified by Specification 2.1.2a. |

SRO A1

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

**Question:**

For the specific case (adjusting APRM gains), where CMFLPD is 0.98 and FRTP is 0.96, how are the APRM gains adjusted?

**Answer:**

- Determine core power and Full Power Adjusted Power Density Ratio (FRADPR) from a 3D Monicore edit.
- If FRADPR is less than or equal to 1.0 the APRM reading (gain adjustment) is adjusted to within +2% of %CTP and less than %CTP **(In the case being analyzed it is NOT less than or equal to 1.0)**
- FRADPR = CMFLPD divided by FRTP which for the case above is 0.98/0.96 FRADPR = 1.02083333, which is more than 1.0.
- In this case the APRM reading (gain adjustment) is adjusted by multiplying the desired %CTP from the step above by the value of FRADPR, 96% x 1.02083333 = 0.98 (within +2% and –0%)
- Bypass the APRM (if possible)
- Adjust the R10 knob on the APRM until the APRM indicates 98% to 100%.

| Technical Reference(s): |
|---|
| N1-OP-43A, Attachment 9<br>N1-REP-12 |

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

**Comments:**

ATTACHMENT 9: APRM GAIN ADJUSTMENT

**PLANT IMPACT:** **ADJUSTING APRMs MAY CAUSE A ROD BLOCK OR HALF SCRAM. THE APRM MAY REQUIRE BYPASSING.**

1. Obtain SSS approval . . . . . ____/_____
SSS Date

2. Inform CSO, APRM gains will be adjusted. . . . . ____/_____
CSO Date

3. Demand new 3D Monicore Edit and record the following:

Load Line Summary - Core Power (%CTP) _____ (__)

Full Power Adjusted Power Density Ratio (FPAPDR) _____ (__) ____/_____

5. N/A, FPAPDR greater than 1.00 (__) . . . . . ____/_____

IF FPAPDR less than or equal to 1.00,
THEN required APRM reading = %CTP (+2%, -0%)

_____ %CTP _____ %CTP + 2% = _____ max setting _____ %CTP - 0% = _____ min setting ____/_____

____/_____
Ind. Verif.

6. N/A, FPAPDR less than or equal to 1.00 (__) . . . . . ____/_____

IF FPAPDR greater than 1.00,
THEN required APRM reading = %CTP x FPAPDR (+2%, -0%)

(_____ %CTP x _____ FPAPDR) = _____ reqd setting Step 7 adjustment

(_____ %CTP x _____ FPAPDR +2% = _____ max setting

(_____ %CTP x _____ FPAPDR -0% = _____ min setting . . . . . ____/_____

____/_____
Ind. Verif.

7. IF conditions permit,
THEN place APRM in bypass per N1-OP-38C . . . N/A (__) ____/_____

____/_____
Ind. Verif.

8. Adjust R10 in each APRM drawer so that APRM meter indicates required APRM reading. . . . . ____/_____

9. IF APRM was bypassed in Step 7,
THEN unbypass APRM per N1-OP-38C . . . . . N/A (__) ____/_____

____/_____
Ind. Verif.

10. IF APRM adjustment performed with FPAPDR greater than 1.00,
THEN post Notice of Adjustment (Attachment 10) on E Panel

N/A this section if FPAPDR less than or equal to 1.00 (__) ____/_____

11. Notify SSS and CSO APRM gain adjustments complete. . . ____/_____

12. File completed attachment in Core Reactivity Book. . . ____/_____

ATTACHMENT 10: NOTICE OF APRM GAIN ADJUSTMENT

ATTACHMENT 10

NOTICE OF APRM ADJUSTMENT E CONSOLE

APRMs have been adjusted for greater than fraction of Rated Thermal Power.

FPAPDR = _____

Actual %CTP = _____

Adjusted %CPT = _____
"As Left" Setting

Date/Time of Adjustment _____

Signature _____

SRO A1

| Nine Mile Point 1<br>Category "A" - Examination Outline Cross Reference | |
|---|---|
| Operating Test Number | Cat "A" Test: 1 |
| Examination Level | SRO |
| 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 posess 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.

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

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

| K/A #: | Importance: |
|---|---|
| 2.1.20 | |

| Comments: |
|---|
| |

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 <u>Adherence to Procedures</u>

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.

SRO A1

| Nine Mile Point 1<br>Category "A" - Examination Outline Cross Reference | |
|---|---|
| Operating Test Number | Cat "A" Test: 1 |
| Examination Level | SRO |
| 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:
a. Unlock and remove the tamper seal on 93-21.
b. 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 X $10^4$ 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
- Declare containment spray pump 111 inoperable.

| Technical Reference(s): |
|---|
| NIP-PRO-01, Section 3.4<br>N1-ST-Q6A |

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

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 <u>Adherence to Procedures</u>

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.

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

| Page No. | Change No. | Page No. | Change No. | Page No. | Change No. |
|---|---|---|---|---|---|
| Coversheet | . | 23 | .50806,53894,54448 | | |
| i | .50806,50966, 51491,51857,52787,53894, 54131,54448,55176 | 24 | .50403 | | |
| ii | . | 25 | .54448 | | |
| 1 | . | 26 | .54448 | | |
| 2 | .50966,54448 | 27 | . | | |
| 3 | .51857,52787 | 28 | . | | |
| 4 | . | 29 | .51491 | | |
| 5 | . | 30 | . | | |
| 6 | .50806 | 31 | . | | |
| 7 | .52787 | 32 | . | | |
| 8 | . | 33 | .50966,52787 | | |
| 9 | .51857,52787, 54448,55176 | 34 | . | | |
| 10 | .50806,51857, 53894,54448 | 35 | . | | |
| 11 | .53894,54448 | | | | |
| 12 | .51857 | | | | |
| 13 | . | | | | |
| 14 | .50966,52787 | | | | |
| 15 | . | | | | |
| 16 | .54448 | | | | |
| 17 | .54448 | | | | |
| 18 | .49398 | | | | |
| 18a | .49398,54131 | | | | |
| 19 | .49398,54131 | | | | |
| 20 | .49398,54131 | | | | |
| 21 | .49398,54131 | | | | |
| 22 | .49215,49398,54131 | | | | |
| 22a | .49398,50966,51491,54131,55176 | | | | |

TABLE OF CONTENTS

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

| Sequence Number | NCTS Number | Description |
|---|---|---|
| <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 ±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

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

5.1 (Cont)

| Portable Test Instrumentation | Range | Required Accuracy |
|---|---|---|
| • 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:

| Instrument Name | Instrument ID Number | Cal. Due Date | |
|---|---|---|---|
| • 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:

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

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.*

Initials/Date

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 x $10^4$ lbm/hr (156.8 x $10^4$ to 163.2 x $10^4$ 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 (IST) Verify Check Valve 80-06 is Exercised to full open position as determined by Non-Intrusive Test equipment.

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

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

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

Initials/Date

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) <EQ> 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:

- 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) 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:

- 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

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

Pi = (_____ft + 7.54 ft) x (0.433 psi/ft)
(Step 8.2.16.a)

Pi = _____psig. (≥0.46 psig) ____/_____

____/_____ Ind. Verif.*

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

Po = _____psig + 4.35 psig.
(Step 8.2.16.b)

Po = _____psig. ____/_____

____/_____ Ind. Verif.*

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

ΔP = _____psig - _____ psig
(Step 8.2.29) (Step 8.2.28)

ΔP = _____psid ____/_____
(154.917 to 179.377 psid)

____/_____ Ind. Verif.*

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

Q = _____lbm/hr x 0.002 __gpm__
(Step 8.2.16.c) lbm/hr

Q = _____gpm
[T/S] (2842 to 2958 gpm) [≥2800 gpm] ____/_____

____/_____ Ind. Verif.*

Initials/Date

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

Pi = (_____ft - 229.25 ft) x (0.433 psi/ft)
(Step 8.2.1a)

Pi = _____psig
(≥ 4.8 psig) ____/_____

____/_____
Ind. Verif.*

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

Po = _____psig + 13.68 psig
(Step 8.2.16.d)

Po = _____psig ____/_____

____/_____
Ind. Verif.*

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

ΔP = _____psig - _____psig
(Step 8.2.33) (Step 8.2.32)

ΔP = _____psid
(189.829 to 219.802 psid) ____/_____

____/_____
Ind. Verif.*

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

$Q = \frac{\text{\_\_\_\_\_}}{\text{(Step 8.2.16.e)}}$ lbm/hr x 0.002 $\frac{\text{gpm}}{\text{lbm/hr}}$

Q = _____gpm
[T/S] (3136 to 3264 gpm) [≥3055 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. ____/_____

Initials/Date

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 $H_2O$ 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.

| 8.2.38 | - | 8.2.11 | = | Total | ( <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). ____/____

| | | Initials/Date |
|---|---|---|
| 9.2 | Verify CLOSED 93-65, CTN SP RW TO CORE SPRAY LOOP 11 (RB 318'). | ____/____ |
| 9.3 | Place CONT SPRAY RAW WATER 111 INTERTIE switch to the CORE SPR 11 position AND verify: | |
| | • 93-71, CONT SPRAY RAW WTR 111 INTERTIE (CORE SPR 11), OPEN | ____/____ |
| | | ____/____ Ind. Verif. |
| | • 93-25, CONT SPRAY RAW WTR 111 INTERTIE (DIS VLV 111), CLOSED | ____/____ |
| | | ____/____ *Ind. Verif. |
| 9.4 | Manually open 93-57, T CK VLV-CONT SPRAY RAW WATER 111 | ____/____ |
| 9.5 | Open the following vent valves: | |
| | • 93-115, VENT 111 CTN SP HX RW OUTLET TO RBFD | ____/____ |
| | • 93-119, VENT 111 CTN SP HX RW INLET TO RBFD | ____/____ |
| 9.6 | Unlock and open 93-87, DRAIN-111 CTN SP RW BEFORE 93-65 TO RBFD to drain CTN SP RAW WTR LOOP 111 (RB 318') | ____/____ |

Initials/Date

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.

| | | Initials/Date |
|---|---|---|
| 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. |

| | | Initials/Date |
|---|---|---|
| 9.23 | Place in green flag AUTO START position CONTAINMENT SPRAY RAW WATER PUMP 111 control switch. | ___/___ |
| | | ___/___ Ind. Verif. |
| 9.24 | Verify closed: | |
| | • 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. |

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

_____/_____
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 (Step 8.1.3.a) | O to C | _____ sec | ≥ 52.1 sec; ≤ 70 sec | ≤ 70.0 sec | (_) SAT (_) UNSAT |
| 80-16 (Step 8.1.4.a) | O to C | _____ sec | ≥ 9 sec; ≤ 15 sec | ≤ 60.0 sec | (_) SAT (_) UNSAT |
| (Step 8.1.4b) | C to O* | _____ sec | ≥ 9.6 sec; ≤ 16.1 sec | ≤ 60.0 sec | (_) SAT (_) UNSAT |
| 93-71 (Step 8.1.6.a) | C to O | _____ sec | ≥17.3 sec; ≤ 28.9 sec | N/A | (_) SAT (_) UNSAT |
| (Step 8.1.6.c) | O to C | _____ sec | ≥16.3 sec; ≤ 27.2 sec | N/A | (_) SAT (_) UNSAT |
| 80-40 (Step 8.1.8.a) | O to C | _____ sec | ≥ 15.6 sec; ≤ 26 sec | ≤ 60.0 sec | (_) SAT (_) UNSAT |
| (Step 8.1.8.b) | C to O* | _____ sec | ≥ 8.7 sec; ≤ 14.5 sec | ≤ 30.0 sec | (_) 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 | (_) SAT (_) UNSAT |
| | | 80-16 Cycled | (_) SAT (_) UNSAT |
| 80-40-ILSC<br>80-40-ILSO<br>SOV-80-40B | CYCLE | 80-40 Satisfactory VPI | (_) SAT (_) UNSAT |
| | | 80-40 Cycled | (_) 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 Step 8.2.31 | PARTIAL FORWARD | FLOW ≥2842 GPM | (_) SAT (_) UNSAT |
| 80-06 Step 8.2.39 | REVERSE FLOW | Change In Discharge Pressure Less than 10 | (_) SAT (_) UNSAT |
| 80-06 Step 8.2.14 | FULL FORWARD | Check valve disk exercised to full open position as determined by Non-intrusive Test equipment | (_) N/A Refuel Only (_) SAT (_) UNSAT |
| 93-10 STEP 8.2.35 | FULL FORWARD | FLOW ≥ 3055 GPM | (_) SAT (_) UNSAT |
| 93-57 STEP 8.2.35 | FULL FORWARD | FLOW ≥ 3055 GPM | (_) 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. Motor Current Limits

| EPN | MEASURED VALUE | Acceptance Criteria | Test Results |
|---|---|---|---|
| 80-04 Step 8.2.19 | _____ AMPS | ≤ 53.5 AMPS | (_) SAT (_) UNSAT |
| 93-82 Step 8.2.23 | _____ AMPS | ≤ 76.5 AMPS | (_) SAT (_) 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 | MEASURED VALUE | ACCEPTANCE RANGE | | ALERT RANGE | | REQUIRED ACTION RANGE | | OVERALL RESULTS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | LOW | HIGH | LOW | HIGH | LOW | HIGH | ACC | AL* | R/A** |
| SUCT PRESS (PSIG) STEP 8.2.28 | | ≥0.46 | N/A | N/A | N/A | N/A | N/A | | | |
| DIFF PRESS (PSID) STEP 8.2.30 | | 154.917 | 179.377 | 151.655 to 154.917 | N/A | <151.655 | >179.377 | | | |
| FLOW GPM STEP 8.2.31 | | 2842 | 2958 | N/A | N/A | N/A | N/A | | | |
| VIB. VERT. PT.1V(IN/SEC) STEP 8.2.24 | | ≤0.250 | | >0.250 | | >0.600 | | | | |
| VIB. HORZ. PT.1H(IN/SEC) STEP 8.2.24 | | ≤0.250 | | >0.250 | | >0.600 | | | | |
| VIB. AXIAL PT.1A(IN/SEC) 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) STEP 8.2.32 | | ≥ 4.8 | N/A | N/A | N/A | N/A | N/A | | | |
| DIFF PRESS (PSID) STEP 8.2.34 | | 189.829 | 219.802 | 185.833 to 189.829 | N/A | <185.833 | >219.802 | | | |
| FLOW (GPM) STEP 8.2.35 | | 3136 | 3264 | N/A | N/A | N/A | N/A | | | |
| VIB. VERT. PT.1V(IN/SEC) STEP 8.2.25 | | ≤ 0.220 | | > 0.220 | | > 0.528 | | | | |
| VIB. HORZ. PT.1H(IN/SEC) STEP 8.2.25 | | ≤ 0.207 | | > 0.207 | | > 0.498 | | | | |
| VIB. AXIAL PT.1A(IN/SEC) 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 ≥2800

(__) YES (__) NO

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

1. Flow recorded in Step 8.2.35 is ≥3055 gpm.

(__) YES (__) NO

2. Pressure recorded in Step 8.2.21 is ≥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).

10.1.6 (Cont)

For any component tested with this surveillance test that is declared inoperable in accordance with the Acceptance Criteria, perform the following:

- Enter it in the ESL
- Enter any applicable Technical Specification LCOs
- Make an entry in the SSS log
- Place a Yellow Hold Out tag on the component
- Write a PID
- Inform IST
- Notify Manager Operations or designee
- Initiate a DER

_____
*Name of Person Notified

Remarks:

_____

_____

_____

_____

_____

_____ / _____ / _____
SSS Date Time

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 1: TEST PERSONNEL SIGNATURE AND INITIAL LOG

| PRINTED NAME | SIGNATURE | INITIALS | DATE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

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

| EPN | DESCRIPTION | LEAKAGE | Initials/Date |
|---|---|---|---|
| | -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 | _____ | ____/_____ |

| EPN | DESCRIPTION | LEAKAGE | Initials/Date |
|---|---|---|---|
| 80-10 | STRAINER - 111 CTN SPRAY STRAINER | _____ | ___/___ |
| | -RB 261-TRACKBAY- | | |
| 80-49 | FE - 111 CTN SPRAY Flow Element | _____ | ___/___ |
| | -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 | _____ | ___/___ |
| | -RB 298 | | |
| 80-155 | SAMPLE - CONT SPRAY HX 111 OUTLET | _____ | ___/___ |
| 80-52 | TE - Temperature Element | _____ | ___/___ |
| 80-40 | BV - 111 CONT SPRAY LOOP TEST | _____ | ___/___ |
| | -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

| EPN | Satisfactory Operation Demonstrated by: |
|---|---|
| 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

| EPN | Satisfactory Operation Demonstrated by: |
|---|---|
| SOV-80-16C | Satisfactory operation of 80-16 |
| SOV-80-16D | Satisfactory operation of 80-16 |

C. SOVs, EQRM 8F

| EPN | Satisfactory Operation Demonstrated by: |
|---|---|
| SOV-80-40B | Satisfactory operation of 80-40 |

D. Pump Motor Bearings, EQRM 16

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

SRO A 2

ES-301 Administrative Topics Outline Form ES-301-1

Facility: Nine Mile Point # 1 Date of Examination: 07/24/2000
Examination Level (circle one): **SRO** Operating Test Number: Cat A Test 1

| Administrative Topic/Subject Description | | Describe method of evaluation:<br>1. ONE Administrative JPM, OR<br>2. TWO Administrative Questions |
|---|---|---|
| A.1 | Parameter Verification | 2.1.7, 2.1.10, 2.1.19, 2.1.33, 2.2.22<br><br>Q.1. During operation at 96% power a core performance edit (3-D Monicore) indicates Core Maximum Fraction of Limiting Power Density (CMFLPD) is 0.98. Who must be notified and what options are available including their preferred order?<br><br>References: N1-REP-12, T.S. 3.1.7, 2.1.2. 3.6.2.b<br>*LER 1-99-03* |
| | | 2.1.7, 2.1.10, 2.1.19, 2.1.33, 2.2.22<br><br>Q.2. For the specific case from the previous question (adjusting APRM gains) how are the APRM gains adjusted?<br><br>Reference: N1-OP-43A, Attachment 9, N1-REP-12 |
| | 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, N1-ST-Q6A |

| | | |
|---|---|---|
| A.2 | Tagging | 2.2.13<br><br>Q.1. During a refueling outage a markup had been issued for the Hydrogen Seal Oil system for cleaning the tank. Other work is also being performed under this markup, including:<br>• Replacing the differential pressure controller<br>• Rebuilding the main seal oil pump motor<br>The markup person has left site and is unavailable when the electrician rebuilding the main seal oil pump motor requests a partial clearance to allow quick starting of the pump motor to insure it is correctly wired. The pump motor is NOT connected to the pump.<br><br>How should this situation be handled?<br><br>Reference: GAP-OPS-02, sections 3.19 to 3.22 |
| | | 2.2.13<br><br>Q.2. During an outage to replace Service Water Piping a contractor wants to weld under a service water markup for pipe replacement. What must this individual do to work under a markup?<br><br>Reference: GAP-OPS-02 |
| A.3 | Radiation Control | 2.3.1, 2.3.4<br><br>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 **and** identify on the map the information that supports the posting(s).<br><br>Reference: S-RAP-RPP-0103, 3.2.6, 3.2.8, 4.4, 4.7 |
| | | 2.3.1, 2.3.10<br><br>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.<br><br>Determine the requirements and restrictions that apply to you prior to and during the drywell entry.<br><br>References: GAP-RPP-02 |
| A.4 | Emergency Communications / Protective Action Recommendations | JPM: Given plant conditions, meteorological data, and the declaration of a General Emergency complete a NRC Event Notification Worksheet per EPIP-EPP-20 and EPIP-EPP-08. K/A 2.4.38 (4.0), 2.4.38 (4.0), 2.4.44 (4.0) |

SRO A2

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

**Question:**

During a refueling outage a markup has been issued for the Hydrogen Seal Oil system for cleaning the tank. Other work is also being performed under this markup, including:

- Replacing the differential pressure controller
- Rebuilding the main seal oil pump motor

The markup person has left site and is unavailable when the electrician rebuilding the main seal oil pump motor requests a partial clearance to allow a quick starting of the pump motor to insure it is correctly wired. The pump motor is NOT connected to the pump.

How should this situation be handled?

**Answer:**

The markup person's supervisor must take responsibility and must walk down the system and markup to determine system status and work status.

A Markup Partial Clearance must be submitted; other people working under the markup must be informed and should sign clear. Additionally the degree of protection must be maintained. No boundary isolations effected.

The SSS must review the request and insure it's complete and plant conditions permit. Independent verification is required.

The designated tags may be cleared and the motor energized. The tag will then have to be re-hung using a markup addition.

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

| Technical Reference(s): |
|---|
| GAP-OPS-02, sections 3.19 to 3.22 |

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

| Comments: |
|---|
| |

3.17.2 (Cont) e. WHEN applying control tags to electrical MCC and Unit Sub breakers, IF a breaker has been OR will be removed from its cubicle, THEN the tag may be attached to the cover panel in close proximity to where the tag would be attached if the breaker were not removed.

f. AFTER completion of the application, enter initials, date and time on the application sheet, certifying that components are in the requested position.

3.17.3 The Independent Verifier should minimize interaction with the individual applying the control tag. IF concurrent verification is deemed appropriate, physical separation is NOT required. The verifier shall:

a. Verify expected conditions AND component alignments against the written control tag requirements.

b. Ensure tags are properly applied.

c. Document independent verification by entering initials, date and time on the application sheet.

3.17.4 IF during the application of a tag it is determined that a device need not be part of the control tag sheet, THEN document the tag removal AND proper position verification on a restoration sheet. The control tag must be confirmed by the controller to still provide adequate control for the work to be performed.

3.18 Control Tagging Issuance

3.18.1 The SSS or CSO, by position, may be the holder of a control tag.

3.18.2 A walkdown is NOT required for a control tag.

3.18.3 The Controller shall review the control tag to ensure proper application and documentation and, IF acceptable:

(C20) a. Verify that the Control Tag Holder is qualified using the list of qualified Markup, Control Tag and Lockout/Tagout Persons required by step 3.24.2 of this procedure.

b. Issue the control tag to a qualified Control Tag Holder (normally the work leader or supervisor directly responsible for the activity), stating:

- the piece of equipment involved;
- identification of devices where tags have been placed;
- and, the control tag number

3.18.4 IF the control tag is acceptable to the Control Tag Holder, the Controller shall issue the control tag.

3.18.5 "OTHERS" are prohibited from signing onto a control tag.

3.18.6 The Controller shall enter initials, date, and time on the control tag coversheet AND log the control tag issued.

(C9) 3.18.7 The Control Tag Holder may apply a lockout/tagout to devices under a control tag as follows:

a. ONLY when approved in accordance with steps 3.14.6, 3.15.1.g and 3.16.1.d.

b. PRIOR to its application, the Control Tag Holder shall notify the Controller of the intent to apply a lockout/tagout.

**NOTES:** 1. lockout/tagout consists of a tag OR a lock AND tag that identifies the Lockout/Tagout Person (Control Tag Holder).

2. WHEN a lockout/tagout is applied, the Lockout/Tagout Person (Control Tag Holder) alone is responsible for ensuring that the lockout/tagout provides adequate protection from hazardous energy.

3. WHILE the lockout/tagout is applied, the Control Tag Holder may claim personal protection.

3.18.8 The Control Tag Holder shall maintain responsibility for the safety of personnel working under their direction.

## 3.19 Operation of Devices Under a Control Tag

(C14) 3.19.1 BEFORE conducting tests OR operating equipment under a control tag, the Control Tag Holder shall field verify that components required to support operation/testing are in the proper alignment, and:

a. IF appropriate, clear employees from the machine or equipment area.

b. IF appropriate, clear the machine or equipment of tools and material; and,

c. IF applicable, ensure employees understand that protection provided by lockout/tagout is to be removed;

d. IF applicable, remove lockout/tagout.

**NOTE:** No person, at any time, for any reason, shall operate devices which have a lockout/tagout attached to them.

3.19.2 Operation shall be in accordance with authority received from the CSO. Equipment under a control tag shall NOT be operated by anyone except the Control Tag Holder OR, at the Control Tag Holder's specific request, by other personnel under the direction of the Control Tag Holder.

(C19) 3.19.3 The CSO shall authorize the operation/repositioning of equipment under a control tag. This authorization may allow numerous operations but shall NOT extend beyond the CSO's current shift. BEFORE granting such authorization, the CSO shall:

a. Review the control tag with the Control Tag Holder to determine component status AND any special conditions OR requirements that may apply.

b. Identify components to be repositioned in order to operate equipment correctly AND safely.

c. Ensure Supported Systems are available to allow proper equipment operation.

d. IF deemed appropriate, ensure a pre-job briefing is conducted.

3.19.4 BEFORE resuming work requiring personal protection, the Control Tag Holder shall reapply the lockout/tagout as applicable.

(C9) 3.19.5 WHEN protection from hazardous energy is no longer required, the Control Tag Holder shall remove the lockout/tagout.

3.19.6 IF the Control Tag Holder can NOT be contacted AND the responsible supervisor is NOT on site, THEN the lockout/tagout may NOT be removed except by the SSS per Step 2.2.2.

3.20 Control Tag Replacements

3.20.1 Individuals shall report loose or missing control tags to the CSO.

3.20.2 The CSO shall direct the verification of equipment status; and, IF required, generation and application of duplicate (replacement) tags.

3.21 Control Tag Surrender/Reissue

3.21.1 The Control Tag Holder may surrender a control tag for reissue to a new Control Tag Holder.

3.21.2 IF the Control Tag Holder is NOT on site, THEN the responsible supervisor may take full responsibility for the control tag AND shall assume the duties as Control Tag Holder by:

3.21.2 (Cont)

a. Verifying the condition of the circuit or equipment AND status of work, as necessary.

b. Ensuring the original Control Tag Holder is informed of the surrender immediately upon return to work.

3.21.3 IF the Control Tag Holder cannot be contacted AND the responsible supervisor is NOT on site, THEN the control tag shall NOT be surrendered, except that the SSS may accept responsibility as the Control Tag Holder.

3.21.4 IF the control tag is to be surrendered AND increased control is desired:

a. A lock shall be used AND remain in place as directed by the Controller.

b. The Control Tag Holder shall remove their personal lockout tag from the lock AND surrender the control tag per step 3.21.5 and 3.21.6.

c. If using a keyed lock, the key shall be turned over to the Controller at the time of the Control tag surrender.

d. If using a keyless lock THEN the Markup person shall:

- Remove their personal lockout tag
- Leave the device locked
- Document on the Control tag coversheet surrender section that a keyless lock is installed.

3.21.5 WHEN surrendering a control tag, the Control Tag Holder shall inform the Controller of the condition of the circuit or equipment AND the status of work.

(C14) 3.21.6 The Control Tag Holder OR Controller shall sign, date and time the control tag coversheet in the surrender section AND note current component status.

3.21.7 BEFORE reissuing a control tag, the Controller and Control Tag Holder shall verify the control tag adequately covers the Work Scope. IF acceptable, the Controller shall issue the control tag per Section 3.18 of this procedure.

3.21.8 The new Control Tag Holder shall maintain responsibility for the control tag per Section 3.19 of this procedure (the same as the original Control Tag Holder).

3.21.9 IF the control tag is acceptable to the Control Tag Holder, the Controller shall reissue the control tag.

3.21.10 IF a lock is in place on the reissued control tag, THEN the Controller shall turn over the lock key to the new Control Tag Holder AND the Control Tag Holder shall apply their personal lockout tag to the lock BEFORE commencing work.

3.21.11 If a keyless lock is in place on the reissued Control tag, THEN the controller shall inform the Control tag holder that a keyless lock is installed AND the Control tag holder shall apply their personal lockout tag with a keyless lock installed before commencing work.

## 3.22 Control Tag Clearance and Restoration

3.22.1 Normally the Control Tag Holder MARKS CLEAR on a control tag. IF the Control Tag Holder can NOT be contacted AND clearance is required, THEN the Control Tag Holder's Supervisor may take full responsibility as the Control Tag Holder and MARK CLEAR.

3.22.2 BEFORE marking clear, the Control Tag Holder shall ensure no conditions exist that preclude clearance AND remove the lockout/tagout, IF applicable.

3.22.3 AFTER verifying conditions permit, the Control Tag Holder shall MARK CLEAR as follows:

a. Report to the Controller the termination of the control tag, stating:

- control tag AND work order number;
- the status of control tagged components; and,
- completion of work or changes in work scope require a markup.

b. Enter signature, date, and time on the coversheet (the Controller may sign for the Control Tag Holder).

3.22.4 The Controller shall notify the SSS that the Control Tag Holder has MARKED CLEAR and the control tag is terminated.

3.22.5 WHEN conditions allow systems, structures, and components under a control tag to be returned to service, the SSS shall:

a. Verify the control tag is MARKED CLEAR.

b. Direct the CSO to clear the control tag.

c. Enter initials in the "TAGS REMOVED BY ORDER OF" box on the control tag restoration sheet.

3.22.6 The CSO shall direct clearance of the control tag, 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.

(C4, C17) b. The component restoration sequence AND restoration position are specified on the restoration sheet as verified from the applicable procedure or system lineup.

(C2) c. IF the component/system is NOT to be returned to the normal line-up, a holdout OR a new control tag 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 control tag restoration sheet.

(C8, C15) e. IF the control tag 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 control tag 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.

3.22.7 The assigned Operators/(Radwaste Operators for Radwaste systems) shall clear the control tag per the following, IF applicable:

a. IF a lock OR lockout tag is found on the device to have the Control Tag removed, contact the Controller.

(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.

3.22.7 (Cont)

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 required).

3.22.8 The Independent Verifier should minimize interaction with the individual clearing the control tag. IF concurrent verification is deemed appropriate, physical separation is NOT required. The verifier shall:

a. Verify expected conditions AND component realignments against the written control tag requirements.

b. Ensure tags are properly removed.

c. Document independent verification by entering initials, date and time on the restoration sheet.

3.22.9 The Controller shall review the cleared control tag 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 control tag cleared.

c. Notify the SSS of any component NOT returned to the restoration position per step 3.22.7.e.

3.22.10 The SSS shall review the cleared control tag and ensure the following, IF applicable:

a. The associated ESL entry is cleared OR revised as required AND initials are entered on the control tag coversheet (to indicate clearance).

(C6) b. BEFORE declaring a system, structure or component identified in the Technical Specifications operable, review Tech Spec CSO/Surveillance requirements and Post-Maintenance Testing requirements, as applicable; AND perform required actions or tests.

SRO A2

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

**Question:**

During an outage to replace Service Water Piping a contractor wants to weld under a service water system markup for pipe replacement. What must this individual do to work under this markup?

**Answer:**

The contractor must sign in as an OTHERS on the markup.

To do this the contractor must first:
(1) be trained on GAP-OPS-02, CONTROL OF HAZARDOUS ENERGY AND CONFIGURATION TAGGING, and
(2) must be designated by a site sponsor.

| Technical Reference(s): |
|---|
| GAP-OPS-02, Section 3.11, 3.24 |

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

**Comments:**

3.10.4 (Cont)

d. WHEN conditions permit, return the device to the previous protective position AND replace the original tag.

1. For safety-related devices, ensure the reapplication is independently verified (unless waived by the SSS per Step 3.4.2).

2. Add a new entry to document that the device has been placed in the required protective position. Include the initials of the individual that reapplied the markup and, IF required, the individual that performed independent verification.

3.10.5 The Controller may reissue the markup to a new Markup Person to continue the same work activity provided:

a. The new Markup Person is afforded the opportunity to perform a partial or full walkdown of the markup;

OR,

at the new markup person's discretion, review piping and instrumentation or circuit diagrams to fully understand the markup boundaries AND verify protection.

b. IF the markup is acceptable to the Markup Person, the Controller shall reissue the markup.

3.10.6 WHEN the Work Scope changes, to request reissue of an existing markup, the new Markup Person shall complete an Equipment Markup/Holdout Request per Section 3.1 of this procedure. This will be used to add tags as appropriate BEFORE reissue.

a. BEFORE reissuing a markup, the Controller and Markup Person shall verify the Markup adequately covers the Work Scope change. IF acceptable, the Controller shall issue the markup per Section 3.5 of this procedure.

b. The new Markup Person shall visually verify protection AND maintain responsibility for the markup per Section 3.5 and 3.6 of this procedure (the same as the original Markup Person), except that the extent of the walkdown performed will be determined by the new Markup Person.

3.11 OTHERS on Markups

3.11.1 IF protection is adequate, personnel working on the same job (in lieu of a surrender and reissue) or a different job, may sign on a markup as OTHERS working under the markup.

3.11.2 The Markup Person shall specify to the Controller whether OTHERS have permission to work under the markup AND any necessary restrictions.

3.11.3 OTHERS desiring to work under an existing markup shall:

a. Obtain consent from the Controller.

**NOTE:** IF Non-NMPC employees meet the qualification requirements as OTHERS per Section 3.24, THEN they may sign on as OTHERS on a markup.

b. IF the Markup Person OR Controller denies permission, THEN initiate a new markup for the work.

3.11.4 The Controller shall ensure the markup provides the necessary protection for the additional work.

3.11.5 IF the markup is acceptable to the OTHER, the Controller shall ensure the OTHER is added to the markup.

3.11.6 The Controller shall initial the entry of the OTHER on the markup form AND inform the OTHER of:

- Equipment involved under the markup
- Identification of devices where tags have been placed
- Markup number

3.11.7 The OTHER shall review the markup AND applicable station drawings to ensure the protection afforded is adequate, and:

a. At the discretion of the OTHER, perform a complete or partial walkdown of the markup, as appropriate, visually verifying protection.

b. Maintain responsibility for the safety of personnel working under the direction of the OTHER (the Markup Person maintains responsibility for the safety of personnel working under the direction of the Markup Person).

3.11.8 BEFORE signing clear, the OTHER shall ensure workers under their direction are clear from the circuit or component.

3.11.9 AFTER verifying conditions permit, the OTHER shall notify the Markup Person and Controller of the status of equipment by signing clear AND documenting equipment status on the appropriate markup form.

3.11.10 IF the OTHER is NOT on site, THEN the responsible supervisor may take full responsibility for the OTHER on the markup AND assume the duties as the OTHER by:

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.

3.23.7 (Cont)

b. BEFORE the responsible Lockout/Tagout Person removes their lock(s) (IF applicable) and tag, the Lockout/Tagout Person taking responsibility for the lockout/tagout shall place their lock(s) (IF applicable) and tag on the equipment.

3.23.8 Removal of a Lockout/Tagout

a. This shall be done by the Lockout/Tagout Person that applied it. IF this person is NOT available to remove the device, the Lockout/Tagout Person's supervisor shall:

1. Make all reasonable efforts to contact the Lockout/Tagout person.

2. Ensure the Lockout/Tagout person has knowledge of the removal of the lockout/tagout device prior to resuming work.

b. Inspect the work area to ensure conditions will permit safe operation of the machine or equipment.

c. Inspect the work area to ensure that other personnel are safely positioned OR clear of the area.

d. Notify affected persons, including the applicable Unit Fire Chief for fire systems, that the Lockout/Tagout devices are to be removed.

e. Remove the Lockout/Tagout device.

f. Restore the machinery or equipment to the desired condition.

## 3.24 Designation of Qualified Markup, Control Tag, Lockout/Tagout Persons and Others

3.24.1 IF necessary, Supervisors shall designate individuals to serve as Markup, Control Tag AND NMP Lockout/Tagout Persons. Selected individuals shall be:

a. Employees of Nine Mile Point Nuclear Station.

b. Task qualified as Markup, Control Tag and/or Lockout/Tagout Persons per NIP-TQS-01, Qualification and Certification.

c. Markup Person and Control Tag Holder designations shall have the same qualification requirements.

3.24.2 Supervisors of subordinates who are qualified Markup, Control Tag and/or Lockout/Tagout Persons shall provide an updated list of qualified Markup, Control tag and/or Lockout/Tagout Persons to the Control Room on a semi-annual basis.

3.24.3 OTHERS AND non-NMP Lockout/Tagout Persons shall have documented training on the requirements of this procedure. Task qualification per NIP-TQS-01 is NOT required.

3.24.4 IF necessary to support work activities, Site Sponsors shall provide an updated list of non-NMP personnel trained as OTHERS to the Control Room.

## 4.0 DEFINITIONS

**4.1 Boundary Isolation Point.** Any device that prevents introduction of energy into an isolated system, structure or component.

**4.2 Maintenance Activities.** Activities performed to correct, monitor, or prevent problems, increase station equipment reliability, or modify station systems, structures or components.

**NOTE:** IF an equipment energy isolation point is in the POWERBLOCK, the POWERBLOCK section of lockout/tagout shall be used.

**4.3 Powerblock Areas.** For Unit 1 and Unit 2, as applicable:

- Reactor Building
- Control Building
- Screenwell
- Switchgear
- Cooling Tower
- Diesel Generator Building
- Nitrogen Tanks and Piping
- Off Gas Building
- Condensate Storage Building
- Electric Tunnels
- North Auxiliary Bay
- Service Water Bays
- Plant HVAC Rooms
- Foam Rooms
- TSC Ventilation Equipment
- Unit 2 Fire Water Systems
- Turbine Building
- Screenhouse
- Switchyard
- Transformer Areas
- Chemical Addition Building
- Hydrogen Dock/Farm
- Main Stack
- Radwaste Building
- Auxiliary Services Building
- Auxiliary Boiler Building
- South Auxiliary Bay
- Service Building
- RSSB
- 2PBS-SLU1 Sewage Lift Station
- Alternate Decay Heat Removal
- Unit 1 Fire Systems Inside the Protected Area

**4.4 Hydraulic Protection.** Protection from hazardous energy contained within a piping system. Examples such as steam, water, gas and compressed air.

SRO A3

| Nine Mile Point 1<br>Category "A" - Examination Outline Cross Reference | |
|---|---|
| Operating Test Number | Cat "A" Test: 1 |
| Examination Level | SRO |
| 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 $cm^2$ 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 |

| K/A #: | Importance: |
|---|---|
| 2.3.1, 2.3.4 | |

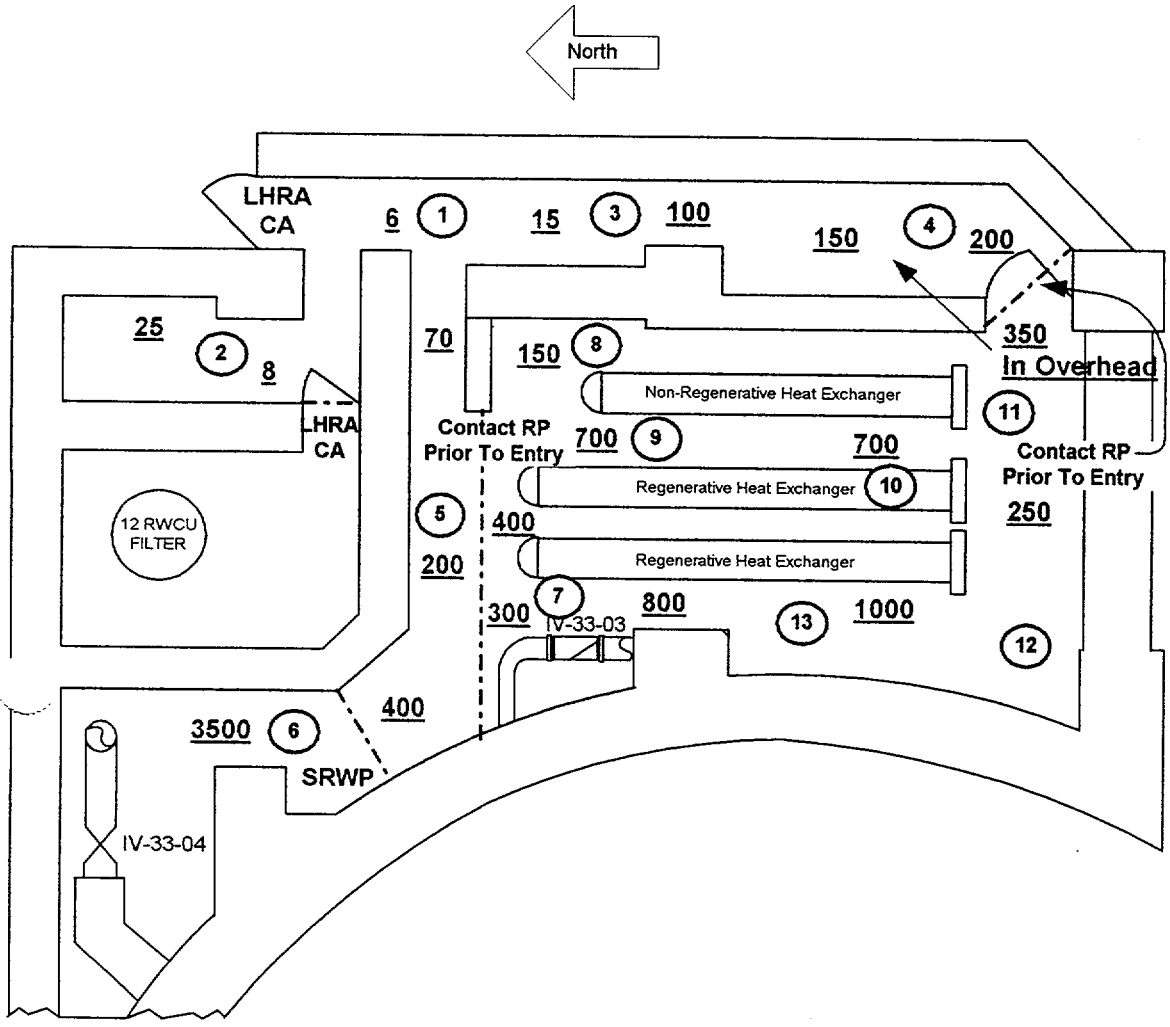
**Comments:**

Niagara Mohawk

# Supplemental Radiation Survey Log Sheet

Map No. **25d**

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




**RO2 3105 9/16/99**

**BC4 884 8/4/99**

**SAC4 1247 9/2/99**

| | |
|---|---|
| Survey No. | 1 RB 24163 |
| Page | of |
| Date/Time | 6/25/99 1300 |
| RWP No. | LHRA Standing |
| Rx Power | 100% |

Results

| # | Item | $\beta\gamma$ dpm/100cm2 | $\alpha$ dpm/100cm2 |
|---|---|---|---|
| 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 | | | |

1. —— = Rope/Area Boundary
2. (#) = Smear Location
3. # = General Area Unless Noted
4. $\frac{\#\ |\ \#}{\#\ |\ \#} = \frac{\gamma\ |\ \beta}{\gamma\ |\ \beta}$
5. (#) = Neutron (mRem/hr)
6. A/S = Air Sample
7. (#) = Large Area Wipe
   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 cm2.

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 $cm^2$ removable beta-gamma; OR

4.4.2 20 dpm/100 $cm^2$ 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 $cm^2$ (5 mRad/hr) fixed contamination or removable contamination in excess of 400 dpm/100 $cm^2$ beta-gamma or 20 dpm/100 $cm^2$ 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 $cm^2$ fixed contamination or removable contamination of 400 dpm/100 $cm^2$ beta-gamma or 20 dpm/100 $cm^2$ 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 $cm^2$ smearable, temporarily set up within the RCA to f7acilitate 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.

SRO A3

| Nine Mile Point 1<br>Category "A" - Examination Outline Cross Reference | |
|---|---|
| Operating Test Number | Cat "A" Test: 1 |
| Examination Level | SRO |
| 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 #: | Importance: |
|---|---|
| 2.3.1, 2.3.10 | |

| 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/100cm2 smearable
DW-295 & 305 20 to 100mREM/hr GA
10,000 dpm/100cm2 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 cm2 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/100cm2 smearable
DW-225 14 to 20 mREM/hr under vessel & dog houses
300 (contact) & 250 (30cm) mREM/hr pump bowls
8 (mRAD/hr)/100cm2 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 Breech.
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

CONTROLLED COPY
Nick Paleologos
Plant Manager - Unit 2

2-3-99
Date

THIS IS A FULL REVISION

Effective Date: 02/11/99

# TABLE OF CONTENTS

## 1.0 PURPOSE

To establish the administrative controls for initiation, preparation, and use of Radiation Work Permits (RWPs) 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 (C1) **Department Supervisors** are responsible to ensure:

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$^2$
- 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 (C3) 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 <u>new</u> line of the RWP Sign-In Sheet when used.

b. Indicate use of respiratory equipment.

3.8 <u>Closing of a Radiation Work Permit</u>

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

| Sequence Number | Commitment Number | Description |
|---|---|---|
| 1 | NCTS 700156-01 | RWP responsibilities clearly identified for workers and supervisors. |
| 2 | SOER 85-3 | Covers the purpose, contents, and requirements for issuing a RWP. |
| 3 | NCTS 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

NIAGARA MOHAWK POWER CORPORATION
OPERATOR JOB PERFORMANCE MEASURE

SRO A.4

Title: Protective Action Recommendations (SRO Only) Revision: 0

Task Number:

Approvals:

| | | | |
|---|---|---|---|
| General Supervisor Operations Training (Designee) | Date | General Supervisor Operations (Designee) | Date |
| Configuration Control | Date | | |

Performer:_____(RO)

Trainer/Evaluator:_____

Evaluation Method: _____Perform ____X__Simulate

Evaluation Location:__X__Plant _____Simulate

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 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-08, Rev 09
2. EPIP-EPP-20, Rev 07
3. NUREG
   K/A 2.4.38 (4.0), 2.4.40 (4.0), 2.4.44 (4.0)

Tools and Equipment:

1. None

Task Standard:

Complete a Nine Mile Point Nuclear Station Notification Fact Sheet - Part 1, including protective action recommendations per EPIP-EPP-08.

Initial Conditions:

1. A LOCA is in progress. Because of radiation levels in the drywell from fuel element failures, a General Emergency was just declared at (use the current time and date). Record current time _____.
2. Plant conditions are as indicated in Attachment 1, General Emergency.
3. Meteorological Data is an indicated in Attachment 2, Meteorological Data (Main Tower, JAF Tower, and Inland Tower)
4. Ask the operator for any questions.

Initiating cue:

"(Operator's name), complete a NRC Event Notification Worksheet (Part I)."

| *Performance Steps* | *Standard* | *Grade* | *Comments* |
|---|---|---|---|
| 1. Provide repeat back of initiating cue. *Evaluator Acknowledge repeat back providing correction if necessary* | Proper communications used for repeat back (GAP-OPS-O1) | Sat/Unsat | |
| **RECORD START TIME _____** | | | |
| 1. •Obtain a copy of the reference procedure and review/utilize the correct section. | EPIP-EPP-20 obtained.<br>- Section 3.1 referenced | Sat/Unsat | |
| **Note: EPIP-EPP-08, may be obtained later while performing this task.** | EPIP-EPP-08 obtained.<br>- Section 3.1 referenced | | |
| 2. Perform actions per EPIP-EPP-20, Emergency Notifications. | EPIP-EPP-20 obtained.<br>Section 3.1 referenced | Sat/Unsat | |

| *Performance Steps* | *Standard* | *Grade* | *Comments* |
|---|---|---|---|
| 3. •Complete Notification Fact Sheet - Part I (Attachment 1A) | Notification Fact Sheet - Part I (Attachment 1A) obtained and completed.<br><br>**Note: Refer to attached Notification Fact Sheet to ensure it is completed correctly.** | Sat/Unsat | |
| •Item 2 | 2A circled | Sat/Unsat | |
| •Item 3 | 3D circled | Sat/Unsat | |
| •Item 4 | 4D circled | Sat/Unsat | |
| •Item 5 | Date and time of declaration of GE entered.<br><br>**Note: Time is from Attachment 1, General Emergency – Plant Conditions.** | Sat/Unsat | |
| •Item 6 | 6A circled | Sat/Unsat | |

| *Performance Steps* | *Standard* | *Grade* | *Comments* |
|---|---|---|---|
| •Item 7<br><br>**Note: EPIP-EPP-08, Section 3.1 referenced.** | Determines the following PRA:<br><br>7B and ERPAs 1,2,3,6,26,27 circled<br><br>7C circled | **Pass/Fail** | |
| •Item 8 | EAL #2.1.3 identified in the box.<br>*Drywell Flooding Required* entered in Additional Information section. | Sat/Unsat | |
| •Item 9 | 9A **or** 9C circled.<br><br>9D circled. | Sat/Unsat | |
| •Item 10 | 10B circled<br><br>Date and time of shutdown entered<br><br>**Note: (Time entered is 20 minutes prior to time provided in initial conditions)** | Sat/Unsat | |
| •Item 11 | Enters 9 mph<br>Enters 200 feet | Sat/Unsat | |
| •Item 12 | Enters 95 degrees<br>Enters 200 feet | Sat/Unsat | |

| *Performance Steps* | *Standard* | *Grade* | *Comments* |
|---|---|---|---|
| •Item 13 | Circles F | Sat/Unsat | |
| Sign the Part I Notification Fact Sheet | Sign the "Approved By (CED/SED)" block. | Sat/Unsat | |

End of JPM

**TERMINATING CUE:** NRC Event Notification Worksheet - Part 1 completed including protective action recommendations.

**RECORD STOP TIME_____**

## Attachment 1
## General Emergency - Plant Conditions

- Plant was at 45% power during a shutdown when a manual reactor scram was required.
- The Reactor Mode Switch was placed to SHUTDOWN twenty (20) minutes ago.
- A LOCA occurred when the reactor scram was inserted.
- All rods fully inserted into the reactor core.
- EOP-7, FLOODING, was entered. The SAPs were just entered to flood the drywell because of ERV failures.
- General Emergency (EAL 2.1.3) was just declared (use the current time for declaration time).
- NO release is in progress.

| Attachment 2 – Meteorological Data<br>*Main Tower* | |
|---|---|
| Wind speed from 30' level (mph) | 8.0 |
| Wind speed from 100' level (mph) | 9.0 |
| Wind speed from 200' level (mph) | 9.0 |
| | |
| Wind direction from 30' level (deg) | 95° |
| Wind direction from 100' level (deg) | 95° |
| Wind direction from 200' level (deg) | 95° |
| | |
| Sigma-Theta from 30' level (deg) | 5.0 |
| Stability class from 30' level | E |
| Sigma-Theta from 100' level (deg) | 3.0 |
| Stability class from 100' level | F |
| Sigma-Theta from 200' level (deg) | 3.0 |
| Stability class from 200' level | F |
| | |
| Temperature from 30' level (deg F) | 20 |
| Dew point from 30' level (deg F) | 18 |
| | |
| Delta-T from 100'-30' (deg F) | -0.70 |
| Stability class from 100'-30' | B |
| Delta-T from 200'-30' (deg F) | -1.30 |
| Stability class from 200'-30' | D |
| | |
| Pressure (in Hg) | 30.00 |
| Precipitation rate (in/15 min) | 0.00 |

| Attachment 2 – Meteorological Data (cont.)<br>*JAF Tower* | |
|---|---|
| Wind speed from 90' level (mph) | 9.0 |
| Wind direction from 90' level (deg) | 94° |
| | |
| Sigma-Theta from 90' level (deg) | 2.8 |
| Stability class from 90' level | F |

| Attachment 2 – Meteorological Data (cont.)<br>*Inland Tower* | |
|---|---|
| Wind speed from 30' level (mph) | 6.0 |
| Wind direction from 30' level (deg) | 91° |
| | |
| Sigma-Theta from 30' level (deg) | 4.3 |
| Stability class from 30' level | E |

# ATTACHMENT 1A
# NINE MILE POINT NUCLEAR STATION
# NOTIFICATION FACT SHEET - PART 1

"THIS IS TO REPORT AN INCIDENT AT NINE MILE POINT NUCLEAR STATION, STAND BY FOR ROLL CALL."

Conduct roll call to include the following:

| Notification No. | ☐ New York State Warning Point | ☐ Oswego County Warning Point | ☐ JA Fitzpatrick Power Plant | ☐ Unaffected 9MP Unit |
|---|---|---|---|---|
| Roll Call Acknowledged by: | Name | Name | Name | Name |

## PART 1 - GENERAL INFORMATION

1. This message is being transmitted on: (*Date*)_____ at (*Time*)_____ VIA: A. RECS B. Other_____

2. This is: (A. NOT an Exercise) B. An Exercise

3. The facility providing this information is: (D. Nine Mile Point Unit 1) E. Nine Mile Point Unit 2 F. J.A. Fitzpatrick

4. The Emergency Classification is: A. Unusual Event B. Alert C. Site Area Emergency (D. General Emergency) E. Emergency Terminated F. Recovery G. Transportation Incident

5. This Emergency Classification declared on: (*Date*) TODAY'S DATE at (*Time*) TIME PROVIDED IN INITIAL CONDITIONS

6. Release of Radioactive Materials (A. No Release (*Above Technical Specification limits*))
   B. Release to the Atmosphere (*Above Technical Specifications limits*)
   C. Release to a Body of Water (*Above Technical Specification limits*)

7. Protective Action Recommendations:
   A. No need for Protective Actions outside the site boundary.
   (B.) EVACUATE the following ERPAs:
   (1) (2) (3) 4 5 (6) 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 (26) (27) 28 29
   (C.) SHELTER all remaining ERPAs

8. EAL #: 2.1.3

   Additional Information DRYWELL FLOODING REQUIRED

OR

9. The Plant status is: (A.) Stable B. Improving AND (C.) Degrading (D.) Hot Shutdown E. Cold Shutdown

10. Reactor Shutdown: A. Not Applicable B. (*Date*) _____ at: (*Time*) _____

11. Wind Speed: 9 Miles/hr at elevation 200 feet

12. Wind Direction: (*From*) 95 Degrees at elevation 200 feet

13. Stability Class: A B C D E (F) G

14. Reported By: (Communicator Name) _____ at Tel. No. (315)_____

"DOES NEW YORK STATE NEED CLARIFICATION ON ANY INFORMATION? (Provide as appropriate)
THIS IS THE END OF THE MESSAGE. STANDBY FOR VERIFICATION ROLL CALL."

| ck those involved in ination roll call. | ☐ New York State Warning Point | ☐ Oswego County Warning Point | ☐ JA Fitzpatrick Power Plant | ☐ Unaffected 9MP Unit |
|---|---|---|---|---|

"NINE MILE POINT 1/2 OUT" Time (24 hr clock): _____

Approved By (CED/SED) _____ (SIGNS HERE)

SPO 04/

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

EMERGENCY PLAN IMPLEMENTING PROCEDURE

EPIP-EPP-08

REVISION 09

# OFF-SITE DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATION

TECHNICAL SPECIFICATION REQUIRED

Approved by:
R. G. Smith — Plant Manager - Unit 1 — 11/16/98 Date

Approved by:
N. C. Paleologos — Plant Manager - Unit 2 — 11-16-98 Date

PERIODIC REVIEW, 03/10/99, NO CHANGE

Effective Date: 12/18/98

**PERIODIC REVIEW DUE DATE** MARCH 2000

## LIST OF EFFECTIVE PAGES

| Page No. | Change No. | Page No. | Change No. | Page No. | Change No. |
|---|---|---|---|---|---|
| Coversheet | . | 23 | . . . . | | |
| i | . . . .51608,51609 | 24 | . . . . | | |
| ii | . . . . | 25 | . . . . | | |
| 1 | . . . . | 26 | . . . . | | |
| 2 | . . . . | 27 | . . . . | | |
| 3 | . . . . | 28 | . . . . | | |
| 4 | . . . . | 29 | . . . . | | |
| 5 | . . . . | 30 | . . . . | | |
| 6 | . . . . | 31 | . . . . | | |
| 7 | . . . . | 32 | . . . . | | |
| 8 | . . . .51367 | 33 | . . . . | | |
| 9 | . . . .51609 | 34 | . . . . | | |
| 10 | . . . . | | | | |
| 11 | . . . . | | | | |
| 12 | . . . . | | | | |
| 13 | . . . . | | | | |
| 14 | . . . . | | | | |
| 15 | . . . .51608 | | | | |
| 16 | . . . . | | | | |
| 17 | . . . . | | | | |
| 18 | . . . . | | | | |
| 19 | . . . . | | | | |
| 20 | . . . . | | | | |
| 21 | . . . . | | | | |
| 22 | . . . . | | | | |

TABLE OF CONTENTS

## 1.0 PURPOSE

To provide the methods for determining meteorology data, release rates, dose assessment and protective actions during accident conditions at Nine Mile Point.

## 2.0 PRIMARY RESPONSIBILITIES

2.1 The **Station Shift Supervisor/Site Emergency Director (SSS/SED)**:

2.1.1 Ensures meteorological data acquisition, release rate determination, and dose assessment are performed during the initial stages of an emergency to support development of Protective Action Recommendations (PARs)

2.1.2 Approves PARs and ensures their timely issue to the State and County

2.2 The **Corporate Emergency Director (CED)** approves PARs prior to their transmittal to the State and County, following EOF activation.

2.3 The **Radiation Assessment Manager (RAM)** is responsible to the SED for managing the onsite radiological monitoring and assessment aspects of the station during an emergency, following TSC activation.

2.4 **Chemistry Technicians** perform release rate assessments, obtain meteorological data, and develop PARs, prior to EOF activation.

2.5 The **Offsite Dose Assessment Manager (ODAM)** manages the offsite dose aspects of an emergency in order to assess the radiological consequences to the public, following EOF activation.

2.6 The **Radiological Assessment Staff** is responsible to the ODAM for obtaining meteorological data, determining source term, performing dose assessment, and developing PARs, following EOF activation.

## 3.0 PROCEDURE

### 3.1 Dose Assessment and Protective Action from the Control Room

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

**CAUTION**

Calculation involving the determination of release rates and/or protection action shall be self-checked for accuracy.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

#### 3.1.1 Chemistry Technician Actions

a. Consult the SSS/SED on plant conditions and possible release paths. If a General Emergency has been declared, assist SSS/SED in making Protective Action Recommendations based on plant conditions using Attachment 1.

b. Access EDAMS computer using Attachment 2

c. Obtain meteorological data using Attachment 3.

d. Assess effluent monitor readings and conditions.

e. Determine release rate using Attachment 4. Combine multiple release points as follows:

   1. Sum all release points from the same elevation (ground or elevated).

   2. Calculate the total release rate from combined ground and elevated sources using the workspace on Attachment 1.

f. Use Attachment 1 flowchart and advise SSS/SED of any PARs recommended by the flowchart.

g. IF an unmonitored atmospheric release is suspected or known to be in progress, then assist the SSS/SED in the following actions:

   1. Advise the SSS/SED to expedite the dispatch of Radiation Protection (RP) Technician. Request assistance of the unaffected Unit or J.A. Fitzpatrick if needed.

   2. The RP Technician should be dispatched to potential plume centerline (wind direction (degrees) ± 180° = plume centerline), as close to the site boundary as practicable. See Attachment 1, Figure 1.4 for Site boundary location.

3.1.1.g (Cont)

3. IF readings indicate > 1 rem/hr based on field survey perform the actions indicated in Attachment 1.

h. Assist Communications Aide in completing the meteorological data and release rate sections of the Part 1 Notification Fact Sheet.

i. Continue to monitor meteorological data, changes in effluent conditions or conditions that might lead to abnormal radiological effluents.

j. When requested, turn over all duties to the EOF.

3.1.2 SSS Actions

a. Verify that the Chemistry Technician is performing dose assessment and protective action development in a timely fashion and in accordance with Attachment 1.

b. Assess any release rates provided by the Chemistry Technician against the Emergency Action Levels (EAL).

c. Review AND approve PARs recorded on the Notification Fact Sheet Part 1, as required. Use ERPA map in Attachment 1 if desired.

## 3.2 Dose Assessment and Protective Actions from the EOF

3.2.1 Offsite Dose Assessment Manager (ODAM) Actions

NOTE: IF at any time the initiating conditions listed in Attachment 1 are met, THEN perform the actions listed in that attachment.

a. Perform actions as indicated in EPIP-EPP-23.

b. Verify Environmental Survey Sample Team Coordinator has been assigned and is:

1. Preparing for the dispatch of downwind survey teams.

2. Is aware of meteorological advisor status.

c. Perform or have performed the following:

1. Obtain meteorology data using Attachment 3 of this procedure.

2. Obtain effluent monitor readings and calculate release rate using Attachment 4 of this procedure.

3.2.1.c (Cont)

3. Perform dose assessment calculation using Attachment 5 of this procedure.

d. Determine PARs using Attachment 5 of this procedure.

e. Interface with State and County representatives in the EOF.

1. Keep State/County representatives informed of confirmed data and results.

f. Complete Part 2 Notification Fact Sheet when ANY of the following conditions exist or are met:

1. Rad release that exceeds Tech Specification limits.

2. Significant changes in meteorological OR rad release conditions.

3. Every 30 minutes.

g. With each significant change in meteorological, actual release rate, and dose assessment data, OR every 30 minutes.

h. Constantly reassess effluent monitors (release rate) and meteorological data for changes. Perform new dose assessment as needed. Develop new PARs and/or verify the adequacy of PARs already made.

i. As Downwind Survey Team (DST) becomes available, utilize it to verify release rates. If these refined release rates differ significantly from those calculated from effluent monitor readings, reperform dose assessment using refined release rates.

j. Provide data for the Part 1 Notification Fact Sheet as requested.

k. Provide CED with pertinent information as needed.

1. Changing radiological conditions that may lead to PARs.

2. Protective actions for site staff.

ℓ. Maintain Chronological Release Rate Log (see Attachment 5.1).

3.2.2 EOF Dose Assessment Staff

a. IF at any time the initiating conditions listed in Attachment 1 are met, THEN perform the actions listed in that attachment.

b. Perform actions as indicated in EPIP-EPP-23.

c. Perform any actions as requested by the ODAM, including:

- Obtaining meteorological data (Attachment 3)
- Obtaining release rate data (Attachment 4)
- Performing dose assessment and protective action recommendations (Attachment 5)

## 4.0 DEFINITIONS

4.1 **$CDE_T$.** Committed dose equivalent to the thyroid for the child.

4.2 **EDAMS.** Emergency Dose Assessment Modeling System. A PC-based computer program that calculates release rates, doses and protective actions, and obtains meteorological data for emergencies.

4.3 **MMS.** Meteorological Monitoring System. Consists of the dedicated computer, main, backup and inland towers and software. Stores and edits site meteorological data.

4.4 **RADDOSE.** A subprogram of EDAMS, it performs the dose assessment functions during emergencies.

4.5 **SHELTERING.** A protective action whose benefit is to bring the public to a heightened state of awareness. No dose reduction is assumed for sheltering.

4.6 **TEDE.** Total Effective Dose Equivalent.

## 5.0 REFERENCES/COMMITMENTS

5.1 Technical Specifications

None

5.2 Licensee Documentation

5.2.1 NMP Unit 1 FSAR, Section XV

a. Table XV-32

b. Table XV-28

5.2.1 (Cont)

c. Table XV-29

d. Table XV-23

e. Table XV-29d

f. Section 1.3.1

g. Section 2.1

5.2.2 NMP Unit 2 USAR, Section 15

a. Table 15.6-15b

b. Table 15.4-12

c. Table 15.7-11

d. Table 15.6-8

e. Table 15.7-4

f. Table 15.6-3

g. Table 16.6-19

5.2.3 SEP, NMPC Nine Mile Point Nuclear Station Site Emergency Plan

5.2.4 NMPC Correspondence 96-MET-001 (Backup Tower Wind Speed Correction Factor)

5.2.5 NMP Correspondence 96-MET-002 (Main Tower Wind Speed Correction Factor)

5.2.6 NMP Correspondence 96-MET-004 (Backup Tower Wind Direction Concerns)

5.2.7 NMP Correspondence 96-MET-003 (Discussion at DER C-95-0693)

5.2.8 NMP Correspondence 96-MET-005 (Main Tower 30' Sigma Theta Concern)

5.2.9 NMP Correspondence 97-MET-002 (Main Tower Wind Obstructions)

5.3 <u>Standards, Regulations, and Codes</u>

NUREG-0654, FEMA-REP-1, Rev 1, Supp 3, Criteria for Protective Action Recommendations for Severe Accidents

## 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:

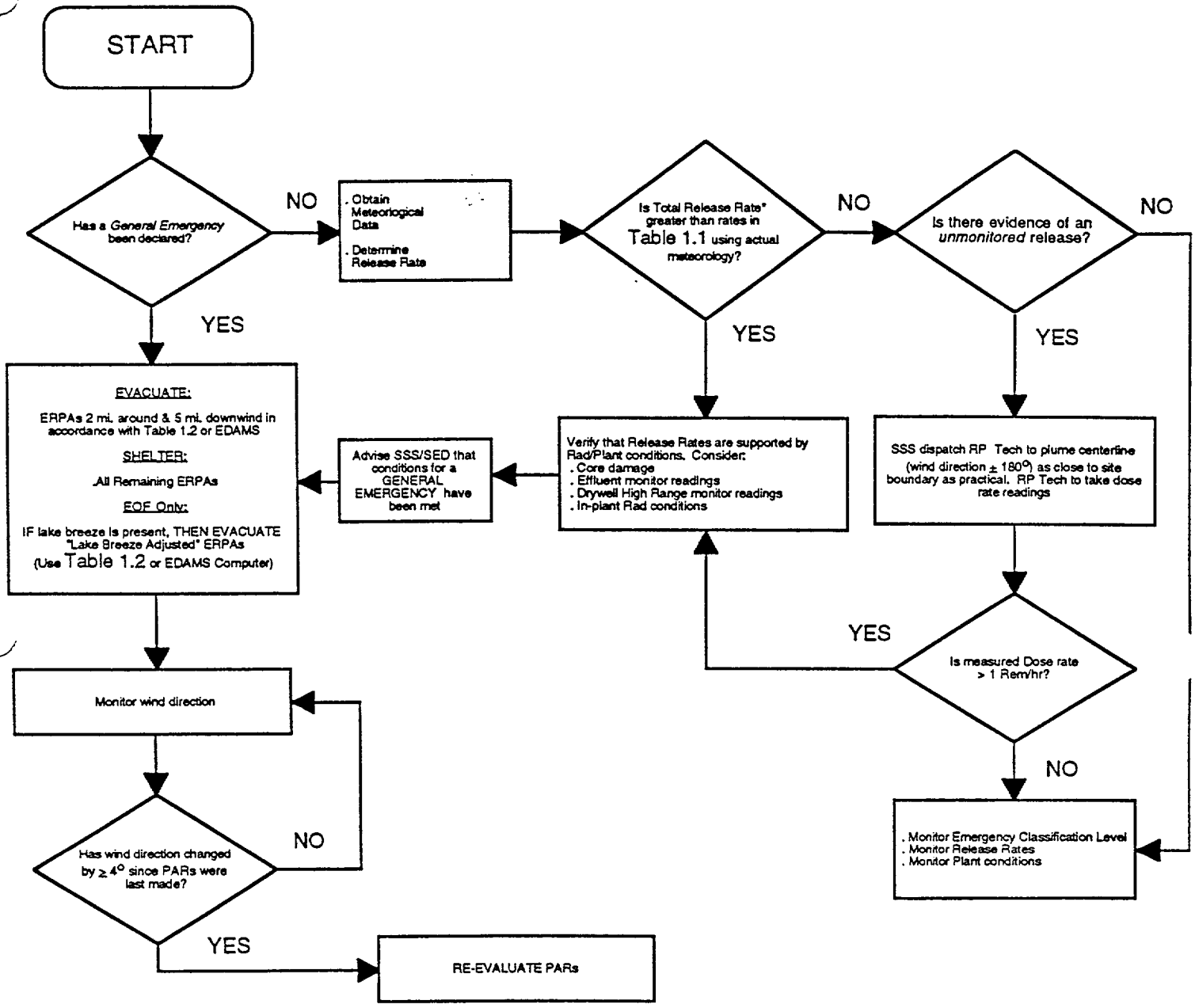
**NOTE:** For records generated due to an actual declared emergency only.

- Attachment 1, Initial Dose Assessment and Protective Actions
- Attachment 4, Release Rate Determination
- Figure 5.1, Chronological Release Rate Log
- Figure 5.2, EDAMS Data Entry Form

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

**NOTE:** For records generated NOT due to an actual declared emergency only.

- Attachment 1, Initial Dose Assessment and Protective Actions
- Attachment 4, Release Rate Determination
- Figure 5.1, Chronological Release Rate Log
- Figure 5.2, EDAMS Data Entry Form




*Use this formula if release has a ground AND elevated source:

$$\left[\frac{\text{Ground Release Rate (Ci/s)}}{\text{Table 1.1 Ground Release Rate (Ci/s)}}\right] + \left[\frac{\text{Elevated Release Rate (Ci/s)}}{\text{Table 1.1 Elevated release rate (Ci/s)}}\right] = \text{IF} \geq 1\text{, A General Emergency Exists}$$

$$\left[\frac{\quad}{\quad}\right] + \left[\frac{\quad}{\quad}\right] =$$

## TABLE 1.1 - GENERAL EMERGENCY RELEASE RATES

| Ground Release (Ci/s) | | | | |
|---|---|---|---|---|
| Wind Speed (mi/h) | Stability Class | | | |
| | A | B/C | D | E/F/G |
| 0-3 | 1333 | 213 | 119 | 38 |
| 4-6 | 3226 | 286 | 143 | 48 |
| 7-9 | 5556 | 526 | 250 | 83 |
| 10-13 | 7692 | 769 | 357 | 117 |
| 14-17 | 10753 | 1075 | 500 | 164 |
| 18-21 | 13514 | 1389 | 667 | 213 |
| >21 | 16393 | 1667 | 833 | 256 |

| Elevated Release (Ci/s) | | | | |
|---|---|---|---|---|
| Wind Speed (mi/h) | Stability Class | | | |
| | A | B/C | D | E/F/G |
| 0-3 | 2041 | 1124 | 3030 | 769 |
| 4-6 | 3703 | 909 | 769 | 769 |
| 7-9 | 5882 | 1515 | 1075 | 1250 |
| 10-13 | 7692 | 2083 | 1388 | 1724 |
| 14-17 | 11494 | 2857 | 1818 | 2273 |
| 18-21 | 14286 | 3704 | 2273 | 2778 |
| >21 | 17241 | 4348 | 2632 | 3226 |

## TABLE 1.2 - AFFECTED ERPAs

| Wind Direction From | 2 Mile Around and 5 Mile Downwind | | 10 Mile Radius | Lake Breeze Adjusted (5 Mile Radius) |
|---|---|---|---|---|
| 214 to 222 | 1, 2, 3, 26, 27 | | 14, 29 | |
| 223 to 233 | 1, 2, 3, 26, 27 | | 14, 29 | 4, 7 |
| 234 to 240 | 1, 2, 3, 7, 26, 27 | | 14, 15, 29 | 4 |
| 241 to 254 | 1, 2, 3, 4, 7, 26, 27 | | 14, 15, 29 | 9 |
| 255 to 262 | 1, 2, 3, 4, 7, 26, 27 | | 14, 15, 16, 17, 29 | 9 |
| 263 to 278 | 1, 2, 3, 4, 7, 9, 26, 27 | | 8, 14, 15, 16, 17, 29 | 5 |
| 279 to 292 | 1, 2, 3, 4, 5, 7, 9, 26, 27 | | 8, 14, 15, 16, 17, 18, 29 | 10 |
| 293 to 305 | 1, 2, 3, 4, 5, 7, 9, 10, 26, 27 | | 8, 14, 15, 16, 17, 18, 29 | |
| 306 to 311 | 1, 2, 3, 4, 5, 7, 9, 10, 26, 27 | | 8, 14, 15, 16, 17, 18, 19, 20, 29 | |
| 312 to 332 | 1, 2, 3, 4, 5, 7, 9, 10, 26, 27 | | 8, 14, 15, 16, 17, 18, 19, 20 | 6, 11 |
| 333 to 340 | 1, 2, 3, 4, 5, 9, 10, 11, 26, 27 | | 8, 15, 16, 17, 18, 19, 20, 21, 25 | 6, 7, 12 |
| 341 to 349 | 1, 2, 3, 4, 5, 9, 10, 11, 26, 27 | | 8, 17, 18, 19, 20, 21, 24, 25, | 6, 7, 12 |
| 350 to 356 | 1, 2, 3, 5, 6, 9, 10, 11, 26, 27 | | 8, 13, 18, 19, 20, 21, 22, 24, 25, 12 | 4, 7 |
| 357 to 0<br>0 to 12 | 1, 2, 3, 5, 6, 9, 10, 11, 26, 27 | | 13, 18, 19, 20, 21, 22, 23, 24, 25, 12 | 4 |
| 13 to 20 | 1, 2, 3, 5, 6, 10, 11, 26, 27 | | 13, 18, 19, 20, 21, 22, 23, 24, 25, 12 | 4, 9 |
| 21 to 51 | 1, 2, 3, 5, 6, 10, 11, 26, 27 | | 13, 19, 20, 21, 22, 23, 24, 25, 28, 12 | 9 |
| 52 to 56 | 1, 2, 3, 5, 6, 11, 26, 27 | | 13, 19, 20, 21, 22, 23, 24, 28, 12 | 10 |
| 57 to 61 | 1, 2, 3, 5, 6, 11, 26, 27 | | 13, 19, 21, 22, 23, 24, 28, 12 | 10 |
| 62 to 70 | 1, 2, 3, 6, 11, 26, 27 | | 13, 19, 21, 22, 23, 24, 28, 12 | 10 |
| 71 to 89 | 1, 2, 3, 6, 26, 27 | | 13, 21, 22, 23, 24, 28, 12 | 11 |
| 90 to 95 | 1, 2, 3, 6, 26, 27 | | 28 | 5, 11, 12 |
| 96 to 114 | 1, 2, 3, 26, 27 | | 28 | 6, 12 |
| 115 to 146 | 1, 2, 3, 26, 27 | | 28 | |
| 147 to 213 | 1, 2, 3, 26, 27 | | 28, 29 | |

EOF Only beyond this line!

## TABLE 1.3 - EPA 400 Protective Action Guidelines (EPA PAGs)

| PAR | TEDE (rem) | $CDE_T$ (rem) |
|---|---|---|
| Evacuate | > 1 | > 5 |

FIGURE 1.4 - Site Boundary Map

# Nine Mile Point

# Site Boundary Map

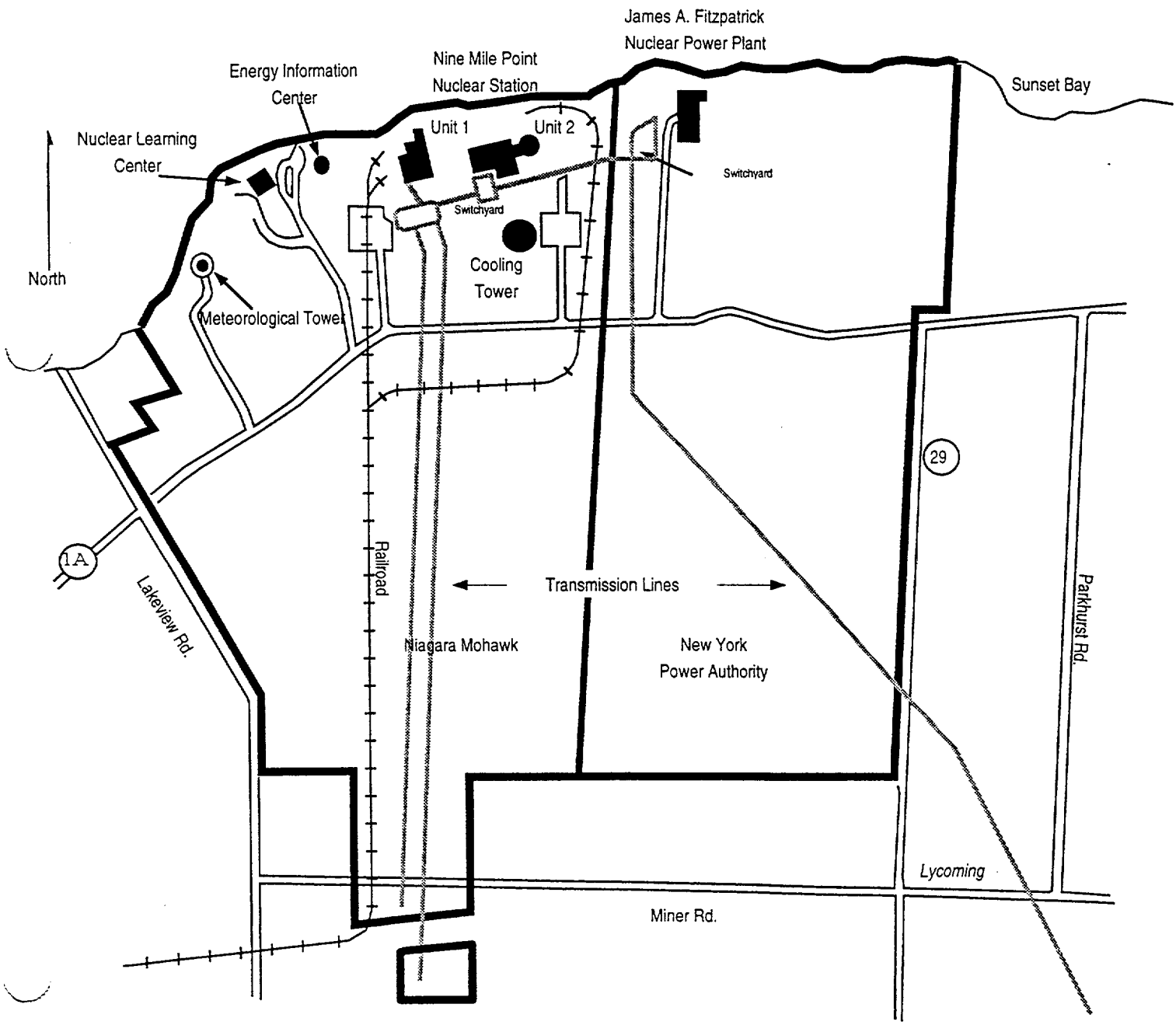
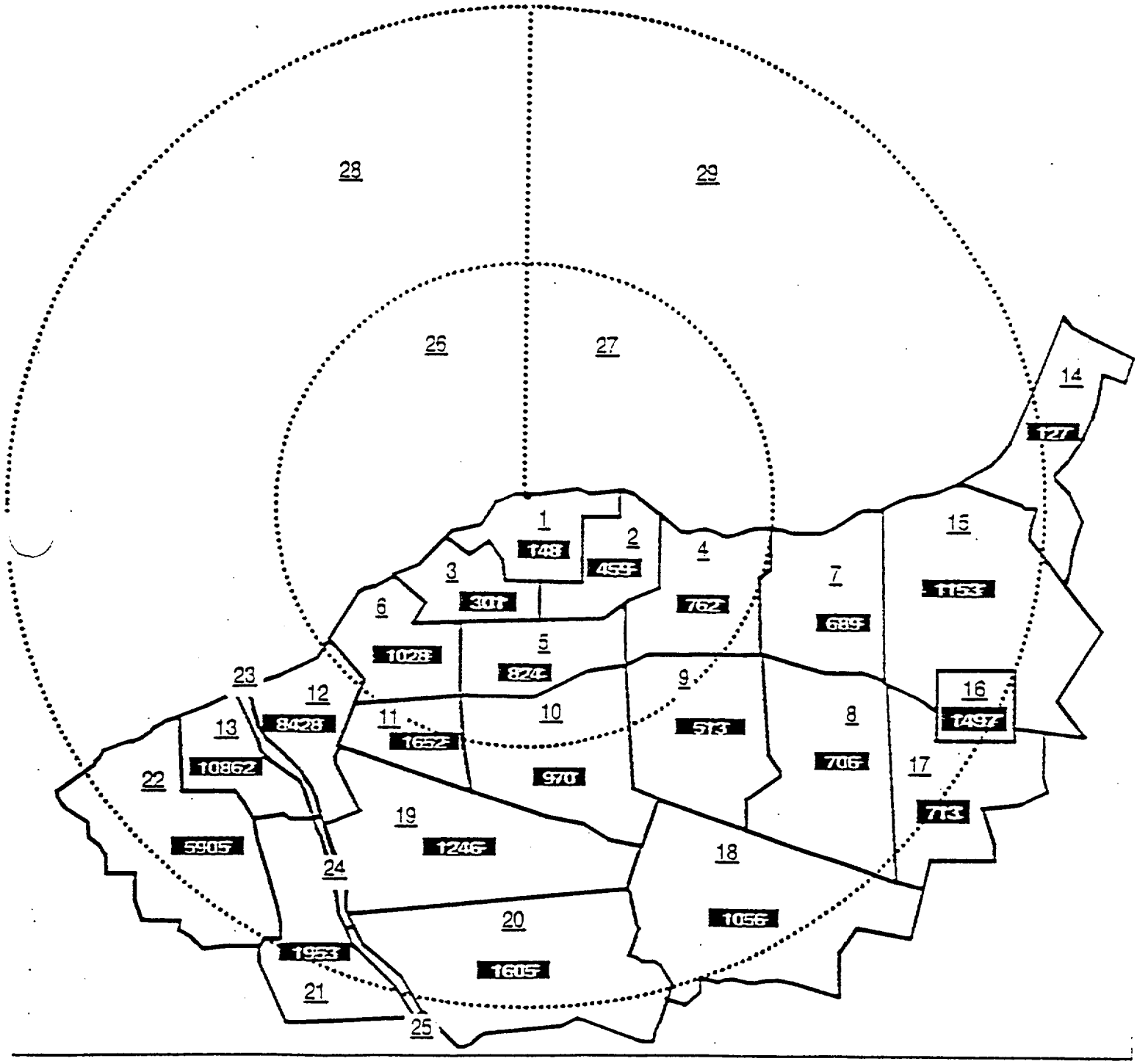


FIGURE 1.5 - ERPA Map




LEGEND 1 ERPA Number 148 ERPA Population

## ATTACHMENT 2: USE OF THE EDAMS COMPUTER



### 1.0 CONTROL ROOM EDAMS

1.1 Turn the system on: Turn on the power to the EDAMS computer, monitor, and printer. After the computer boots:

a. Select the "EDAMS" icon.
b. Select the "Login" icon.
c. Select "Direct Connect to Met Data".
d. Once Login is successful/complete, select "OK".
e. Select appropriate icon.

1.2 Computer or Connect Problems

a. If "Direct Connect to Met Data" fails, select "Automatic Dial-In to Met Data".

b. If "Automatic Dial-In to Met Data" fails, select "Manual Dial-In to Met Data".

c. If at any time problems are experienced with the computer, depress the eject button on the front of the computer. This will eject the laptop computer. Continue this procedure with the laptop.

d. If the laptop should fail, have the Chemistry Tech from the unaffected Unit go to the unaffected Control Room and bring the EDAMS laptop back to the affected Control Room and continue with this procedure.

NOTE: In this case, meteorological data will have to be obtained manually.

### 2.0 EOF EDAMS

2.1 Turn the system on: Turn on the power to the EDAMS computer, monitor, and printer. After the computer boots:

a. Select the "EDAMS" icon.
b. Select the "Login" icon.
c. Select "Automatic Dial-In to Met Data".
d. Once Login is successful/complete, click on "OK".
e. Select the appropriate icon.

2.2 Computer or Dial-In Problems

a. If "Automatic Dial-In to Met Data" fails, select "Manual Dial-In to Met Data".

b. If at any time problems are experienced with the computer, use the duplicate EDAMS computer in the EOF.

## 3.0 EDAMS DOSE MODEL LIMITATIONS

3.1 A calculational limitation of the dose assessment model occurs when an extreme wind (direction) shift takes place. The model may not calculate doses in sectors that the plume skips over entirely within a single 15 minute calculation step.

3.2 EDAMS only allows the operation of one application at a time.

3.3 Dose rates and deposition rates reported by the model are the maximum for the sector, not necessarily the dose rate or deposition rate at the center of the sector. This avoids the situation of a narrow (stable) plume slipping between receptor points and being missed.

3.4 Deposition data reported is not intended for an environmental evaluation; its intent is to indicate areas of potentially high ground level concentrations.

## 1.0 OBTAINING METEOROLOGICAL DATA

The methods of obtaining meteorological data are listed below in the order that they should be used.

- **EDAMS** (see Section 3.0 of this Attachment)
- **Strip Chart Recorder** (see Section 4.0 of this Attachment)
- **Manual input from alternate sources** (see Section 5.0 of this Attachment)

## 2.0 USE OF METEOROLOGICAL DATA: GENERAL CONDITIONS

NOTE: Wind speed measurements at both the main and backup towers may on occasion be less than actual observed winds. When using the main tower winds and the wind direction is between 0° and 100° or when using the backup tower and the wind direction is between 220° and 270°, **caution** should be exercised when estimating plume arrival time, its likely that the plume will arrive sooner than what the wind speed would indicate. Additionally the actual dose may be less than forecast by EDAMS.

2.1 Hierarchy of NMP meteorological data sources is shown in Table 3.1 below.

NOTE: Heights of meteorological instrumentation is approximate.

2.2 If substitute data is to be used, consult the Meteorological Advisor (if available).

2.3 If using 200', 100', or 30' **sigma theta stability** and the wind is blowing from a direction listed below, substitute to the next source per table 3.1's **Stability** section.

| Main Tower Sigma Theta Stability | Wind Direction |
|---|---|
| 200' | 030° to 096° |
| 100' | 030° to 077° |
| 30' | 035° to 076° |

2.4 If using the **JAF Backup sigma theta stability** (for either ground or elevated level release), the following adjustments should be made:

| JAF Backup Tower Wind Direction (From) | JAF Backup Sigma Theta Stability Adjustment |
|---|---|
| 232° to 246°<br>or<br>270° to 281° | Add one stability class such that:<br>A → B<br>B → C<br>C → D<br>D → E<br>E → F<br>F or G → G |
| 247° to 269° | Add two stability classes such that:<br>A → C<br>B → D<br>C → E<br>D → F<br>E,F, or G → G |

2.5 If no release is in progress, or release path is unknown, use elevated data (200' main tower), or substitute as outlined in Table 3.1.

2.6 The Meteorological Advisor may use any source (Sodar, other towers, characterization tables, etc.) or skills of the trade to satisfy the need for meteorological data.

TABLE 3.1: HIERARCHY FOR USE OF NMP METEOROLOGICAL DATA SOURCES

| Parameter | Hierarchy | Elevated Release | Ground Release |
|---|---|---|---|
| Wind Speed & Direction | Primary | 200' Main | 30' Main |
| | Substitutes | 100' Main | |
| | | JAF Backup | |
| | | 30' Main | 200' Main |
| | | Inland | |
| Stability | Primary | 200' ΔT | 100' ΔT |
| | Substitutes | 100' ΔT | 200' ΔT |
| | | 200' Sigma Theta (1) | 30' Sigma Theta (1) |
| | | 100' Sigma Theta (1) | |
| | | JAF Backup Sigma Theta (2) | |
| | | 30' Sigma Theta (1) | 200' Sigma Theta (1) |
| | | Inland Sigma Theta | |

(1) If using the 30', 100', or 200' Sigma Theta stability, AND the wind is from a direction listed in Step 2.3, THEN substitute the next source of data in accordance with Table 3.1 of this attachment.

(2) If using the JAF Backup Sigma Theta stability, AND the wind is from a direction listed in Step 2.4, THEN substitute the next source of data in accordance with Table 3.1 of this attachment.

2.7 Refer to Figure 3.2 to determine if lake breeze is a possibility (EOF only).

2.8 Refer to Figure 3.3 to determine if land breeze is a possibility (EOF only).

## 3.0 EDAMS

3.1 To obtain meteorological data for the Notification Fact Sheet Part 1, select "Emergency Meteorological Report" from the EDAMS main menu.

3.2 Select "Print Met Data" to print the data.

## 4.0 STRIP CHART RECORDER

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

**CAUTION**

Do not use the LED readouts associated with the strip chart recorders.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

**NOTE:** Use this data only if the method described in Section 3.0 of this Attachment is unavailable.

4.1 Strip chart meteorological data can be found in both of the Control Rooms, and in the TSC. Utilize Table 3.1 to determine source of data.

**NOTE:** ΔT cannot be obtained in the TSC. Utilize $\sigma\theta$ in determining stability.

4.2 Figures 3.4 and 3.5 show sample strip chart traces showing ambient air temperature, ΔT, $\sigma\theta$, wind speed and direction data.

4.3 Observe the values of the vertical temperature difference, $\Delta T$, from the primary meteorological tower over the last 15 minute period. The preferred reading is the 30'-200' Delta temperature reading, for an elevated (stack) release.

4.4 Compare the values of $\Delta T$ to the Stability Classification Chart (Table 3.6) and select the appropriate stability class and record.

4.5 If values of $\Delta T$ are not available, then observe the values of $\sigma\theta$, directly from the primary or backup meteorological tower recorders, over the last 15 minute period.

4.6 Compare these values of $\sigma\theta$ to Table 3.6. Using the chart, select the appropriate stability class and record.

4.7 If both data are available, use the $\Delta T$ at 30'-200' elevation for elevated releases: use $\sigma\theta$ at the 30' elevation for ground (vent) releases.

4.8 If values for $\Delta T$ and $\sigma\theta$ are not available, then observe the wind direction trace over the last 15 minute period. Determine $\sigma\theta$ by dividing the horizontal deviation of the wind direction trace over the last 15 minutes by 6. To make reading of the strip charts easier, you may want to advance the chart.

## 5.0 MANUAL INPUT FROM ALTERNATE SOURCES

NOTE: Use this data only if the methods described in Section 3 and 4 of Attachment 3 are unavailable.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CAUTION

Data obtained by the methods described below will not be site-specific and will likely introduce errors into dose assessments. The Meteorological advisor shall be consulted regarding the use of all substitute data. If the Meteorological advisor is not available, use the data as obtained.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

5.1 National Weather Service

a. Telephone the National Weather Service (NWS) in Buffalo at 800-462-7751 or 716-565-9001.

b. Request the current wind speed and direction, stability class and temperature.

c. Use this data as follows:

1. Wind speed (NWS) = elevated and ground wind speed

2. Wind Direction (NWS) = elevated and ground wind direction

3. Stability Class (NWS) = stability class

5.1.c (Cont)

4. Temperature (NWS) = ambient temperature

5.2 Other Sources

a. Other sources of meteorological data that may be utilized are as follows:

1. SODAR

2. Other (non-NWS) meteorology towers

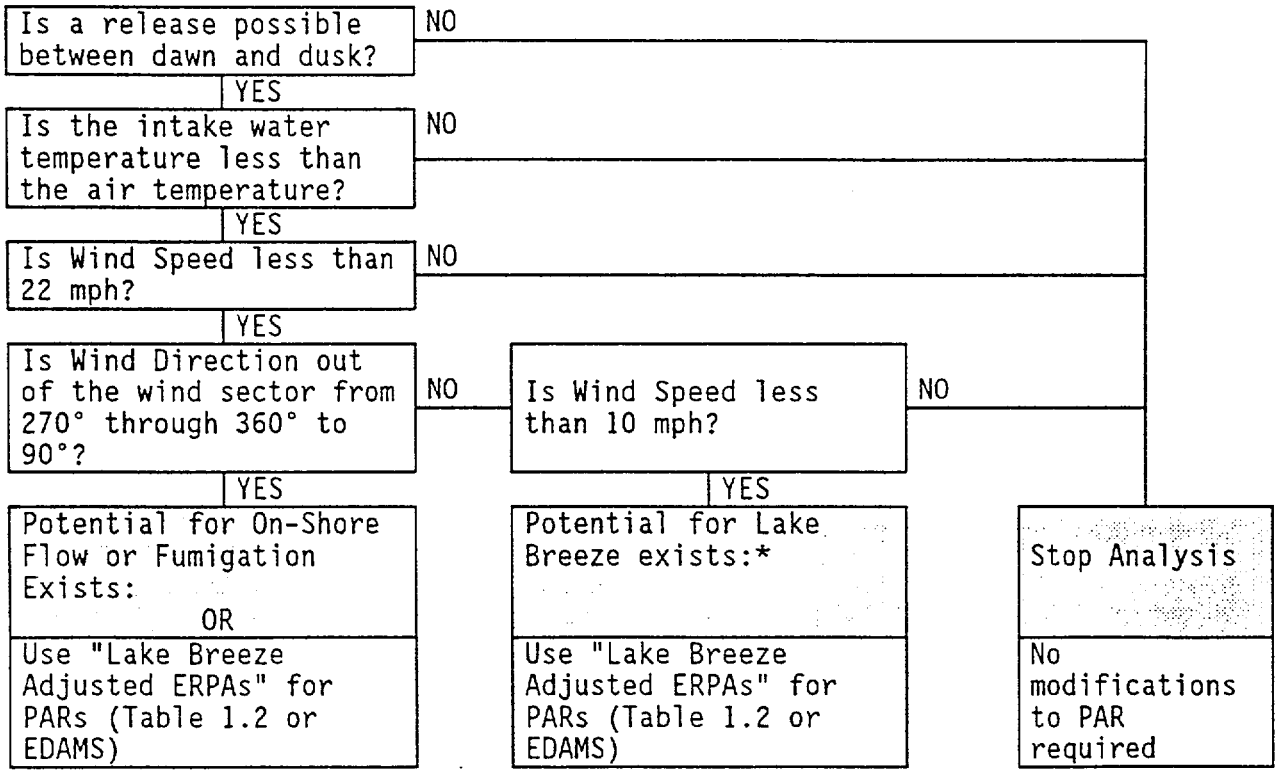
3. Commercial weather services

**FIGURE 3.2**
**Lake Breeze/On-Shore Flow and Fumigation Flow Chart**

1. Obtain meteorological data per Section 1.0 of this Attachment.

2. Obtain lake intake water temperature from Unit 1 or 2 process computer or from Control Rooms.

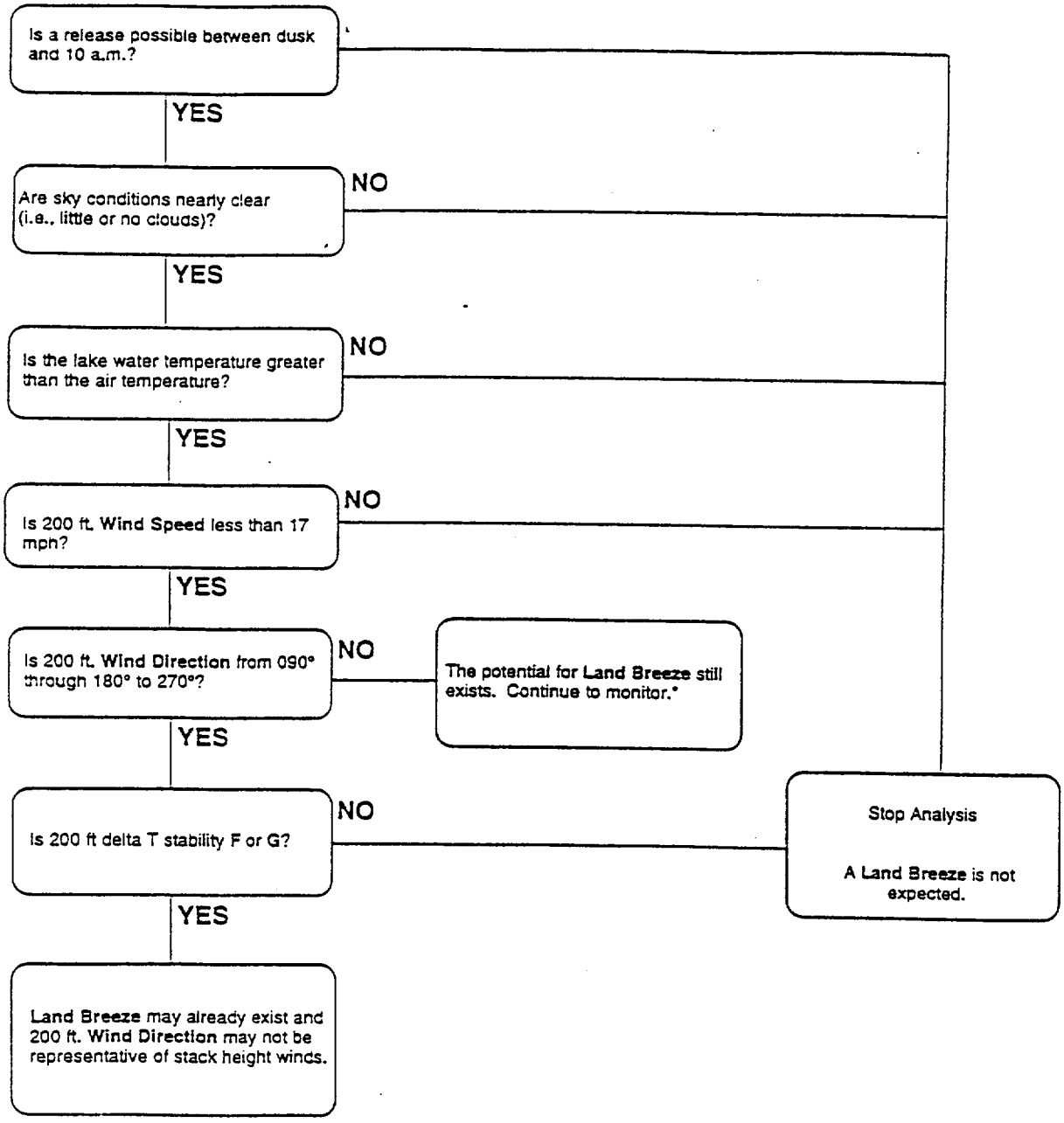
3. Follow the flow chart answering the appropriate questions.




* Also note that there is a potential for a sudden shift in wind direction to 245° through to 65° if the lake breeze has not already formed.

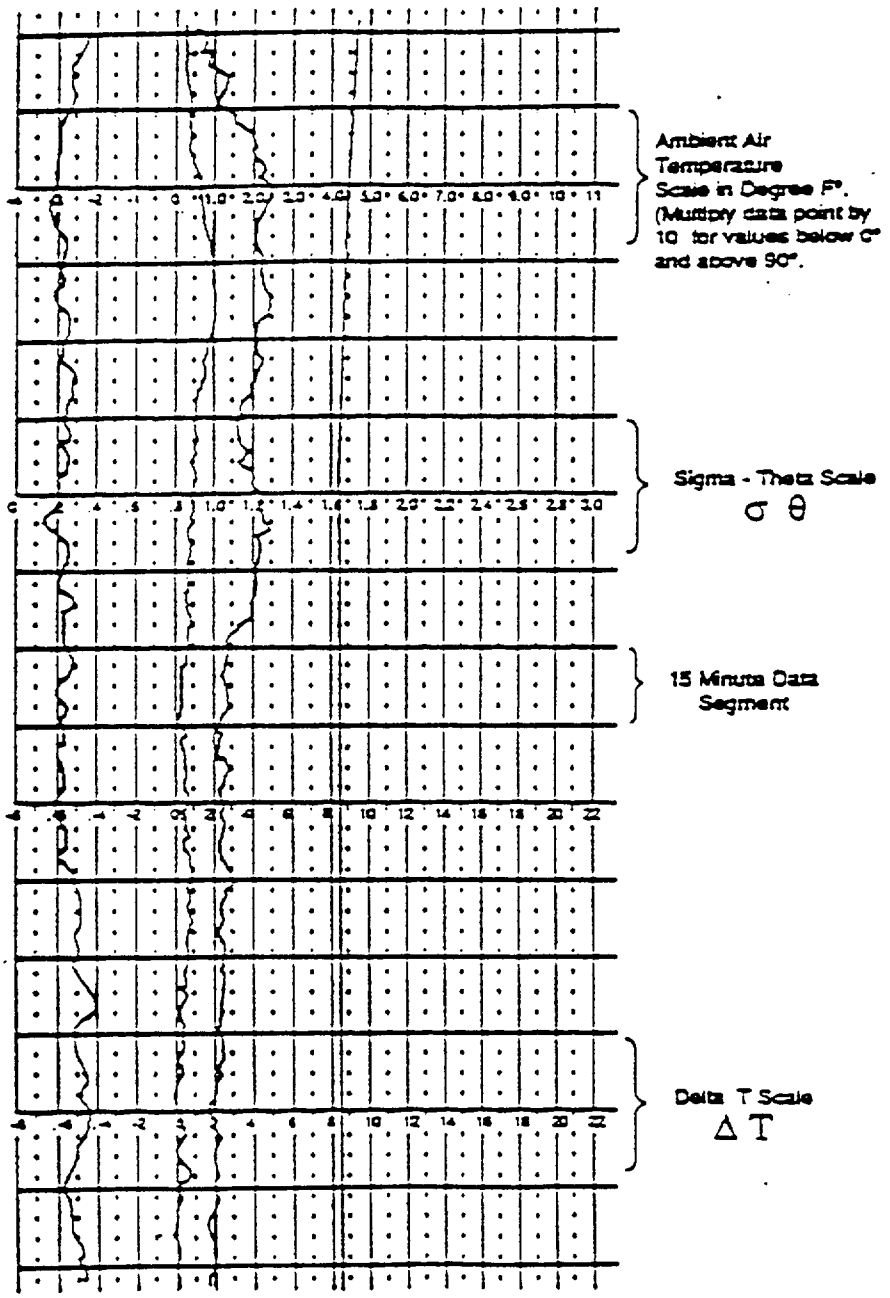
## FIGURE 3.3
## LAND BREEZE FLOW CHART

1. Obtain Meteorological Data.
2. Obtain lake temperature.
3. Follow the flow chart answering the appropriate questions.

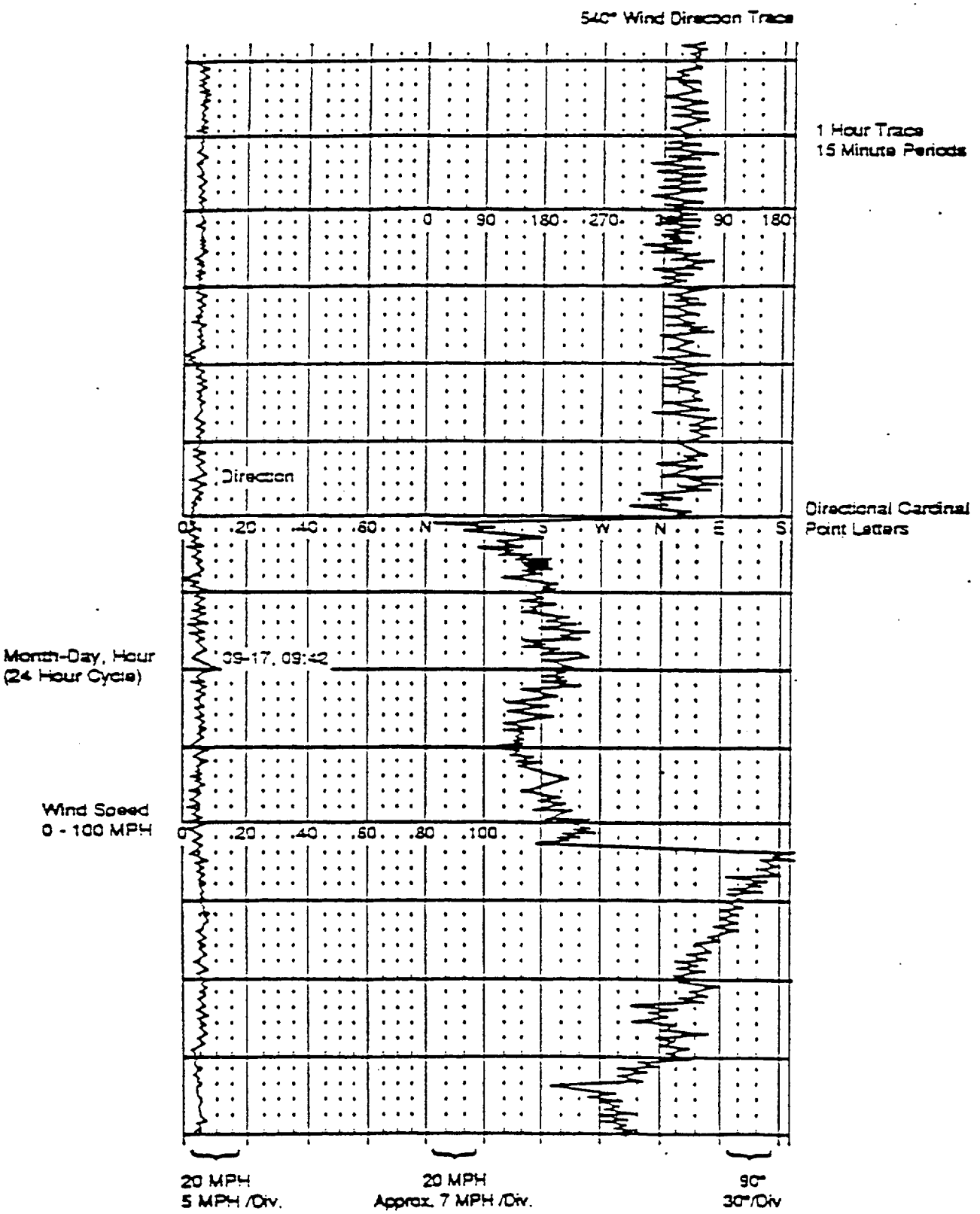



*NOTE: There is a potential for a shift in Wind Direction to 090° through 180° to 270° at the weather tower.

FIGURE 3.4
SAMPLE AIR TEMPERATURE AND STABILITY CLASS TRACE - CONTROL ROOM



## FIGURE 3.5
## SAMPLE WIND SPEED AND WIND DIRECTION TRACE - CONTROL ROOM/TSC



## TABLE 3.6 - STABILITY CLASSIFICATION CHART

| STABILITY CLASSIFICATION | NMPC TURBULENCE CLASS | PASQUILL CAT. | TEMP CHANGE WITH HEIGHT, °F/70ft[1] | $\sigma_\theta$ DEGREES RANGE OF VALUES[2] | TEMP CHANGE WITH HEIGHT, °F/168ft[3] |
|---|---|---|---|---|---|
| Extremely Unstable | I | A | $\Delta T/\Delta Z \leq -0.73$ | $22.5 \leq \sigma\theta <$ | $\Delta T/\Delta Z \leq -1.75$ |
| Moderately Unstable | II | B | $-0.73 < \Delta T/\Delta Z \leq -0.65$ | $17.5 \leq \sigma\theta < 22.5$ | $-1.75 < \Delta T/\Delta Z \leq -1.57$ |
| Slightly Unstable | II | C | $-0.65 < \Delta T/\Delta Z \leq -0.58$ | $12.5 \leq \sigma\theta < 17.5$ | $-1.57 < \Delta T/\Delta Z \leq -1.38$ |
| Neutral | III | D | $-0.58 < \Delta T/\Delta Z \leq -0.19$ | $7.5 \leq \sigma\theta < 12.5$ | $-1.38 < \Delta T/\Delta Z \leq -0.46$ |
| Slightly Stable | IV | E | $-0.19 < \Delta T/\Delta Z \leq 0.58$ | $3.8 \leq \sigma\theta < 7.5$ | $-0.46 < \Delta T/\Delta Z \leq 1.38$ |
| Moderately Stable | IV | F | $0.58 < \Delta T/\Delta Z \leq 1.53$ | $2.1 \leq \sigma\theta < 3.8$ | $1.38 < \Delta T/\Delta Z \leq 3.69$ |
| Extremely Stable | IV | G | $1.53 < \Delta T/\Delta Z$ | $\sigma\theta < 2.1$ | $3.69 < \Delta T/\Delta Z$ |

(1) Adjusted to correspond to the ΔT measured between the 30-foot and 100-foot levels.

(2) Note on symbol convention "$3.8 \leq \sigma\theta < 7.5$" means that $\sigma\theta$ is greater than or equal to 3.8 degrees but less than 7.5 degrees.

(3) Adjusted to correspond to the ΔT measured between the 30-foot and 200-foot levels.

### ATMOSPHERIC STABILITY CHARACTERIZATION

A. (I) Mid-afternoon only, with clear skies or skies with very few thin clouds; late spring to early fall, winds usually are below 6 miles per hour.

B. (II) Late morning to mid-afternoon only, with clear or partly cloudy skies; mid spring to mid-fall, winds are usually below 9 miles per hour.

C. (II) Late morning to late afternoon only, with partly cloudy skies; spring through fall, winds are usually below 11 miles per hour.

D. (III) All daytime, with overcast or partly cloudy skies or early morning and late afternoon with clear or partly cloudy skies, all night time with overcast skies or partly cloudy year around, winds are moderate to high (greater than 6 miles per hour).

E. (IV) Typically night time only, with thin overcast or partly cloudy skies, all year around, winds less than 10 miles per hour.

F. (IV) Typically night time only, with clear to partly cloudy skies, all year around, winds less than 7 miles per hour.

G. (IV) Typically night time only, with clear skies or very few thin clouds all year around, winds less than 5 miles per hour.

1.0 METHOD

a. Access the EDAMS Computer using Attachment 2 of this procedure.

b. Select the "EDAMS (PARs and Release Rate Calcs)" Icon.

c. IF Unit 1 was selected, go to Section 2.0 of this Attachment.

d. IF Unit 2 was selected, go to Section 3.0 of this Attachment.

2.0 UNIT 1 METHODS

2.1 OGESMS

a. Select monitor (7, 8, 10a or 10b)

NOTE: Monitor 7 = indicator 112-07A
Monitor 8 = indicator 112-08A
Monitor 10a = indicator RN10A
Monitor 10b = indicator RN10B

b. Enter time that reading was obtained (using 24 hour format)

c. Enter monitor reading (cpm for monitors 7 or 8, cps for monitors 10a or 10b). Use J panel readings or the following computer points:

- monitor 7, use E334
- monitor 8, use E335
- monitor 10a, use E488
- monitor 10b, use E489

d. Enter process computer calibration factor. If unavailable, use default values below:

- 4.4E-8 for 7 or 8
- 4.4E-7 for 10a or 10b

e. Enter Stack Flow (kcfm). Use computer point C320 or calculate from Table 4.1.

f. Hit the "F9" key.

g. Print results.

2.2 RAGEMS

a. Enter the time that the reading was obtained (24 hour format).

b. Enter the monitor reading (cps). Use J panel reading or computer point C321.

c. Enter calibration factor (use posted value).

d. Enter dilution factor as follows:

= 1 if 6 liter chamber is used
= 1E3 if 30 cc chamber is used
= 2E5 if 30 cc chamber plus first stage dilution is used. Use Total Dilution Ratio (TDR) x1000 as the dilution factor, if TDR is known.
= 4E7 if 30 cc chamber plus first and second stage dilution is used. Use TDR x1000 as the dilution factor, if TDR is known.

2.2 (Cont)

e. Enter Total Stack Flow (kcfm). Use computer point C320 or calculate from Table 4.1.

f. Hit the "F9" key.

g. Print results.

2.3 Stack Teletector

a. Enter the time that the reading was obtained (24-hour format).

b. Enter the monitor reading (mrem/hr).

c. Enter the calibration factor. If unavailable, use default value of 0.5.

d. Enter Total Stack Flow (kcfm). Use computer point C320 or calculate from Table 4.1.

e. Hit the "F9" key.

f. Print the results.

2.4 Grab Sample (Noble Gas)

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CAUTION

In using grab samples to determine release rate, the results may be invalid if significant changes in source terms have occurred since the sample was taken.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

a. Enter the time that the reading was obtained (24-hour format).

b. Enter total Noble Gas concentration ($\mu$Ci/cc).

c. Enter Total Stack Flow (kcfm). Use computer point C320 or calculate from Table 4.1.

d. Hit the "F9" Key.

e. Print the results.

2.5 Back Calculation

NOTE: Use back calculation of downwind survey team data to determine release rate when no other method is available, AND to verify calculated release rates.

a. Enter the time that the reading was obtained (24-hour format).

b. Enter the wind speed (mi/hr). Use the method described in Attachment 3.

c. Enter "E" for elevated/stack or "G" for ground/vent release.

2.5 (Cont)

d. Enter the stability class (A-G).

e. Enter the three foot closed window reading from the ion chamber (mrem/hr). If readings are in CPM, then convert using 3500 CPM = 1 mrem/hr.

f. Enter the downwind distance that the above reading was obtained.

g. Hit the "F9" key.

h. Print the results.

2.6 FSAR

NOTE: Input from the Control Room or TSC staff is necessary to select the FSAR accident type that most closely describes the conditions being experienced.

a. Select the accident being experienced or projected (Use Attachment 5, Table 5.1).

b. Print results.

2.7 Containment High Range Monitor

NOTE: This method is only valid if the monitor is able to "see" the release. Therefore, consult Operations personnel on the validity of monitor readings.

a. Enter the monitor ID or number.

b. Enter the time that the reading was obtained (24-hour format).

c. Enter the date that the reading was obtained.

d. Enter the time of reactor shutdown (24-hour format).

e. Enter the date that the reactor was shutdown.

f. Enter the monitor reading (rem/hr). Use computer point E467 or E468.

g. Enter the expected flow rate (kcfm) to the environment. Consult with Operations personnel if needed.

h. Hit the "F9" key.

i. Print results.

2.8 For liquid releases, consult N1-CSP-M204

3.0 UNIT 2 METHODS

3.1 GEMS

a. Enter the time that the reading was obtained (24-hour format).

b. Enter "S" if this is a stack reading or "V" if it is a vent reading.

c. Enter monitor reading ($\mu$Ci/s). Use GEMS readings from SPDS display or the 882 panel. If offscale, use GEMS computer.

d. Hit the "F9" key.

e. Print results.

3.2 Grab Sample (Noble Gas)

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CAUTION

In using grab samples to determine release rate, the results may be invalid if significant changes in source terms have occurred since sample was taken.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

a. Enter the time that the reading was obtained (24-hour format)

b. Enter total Noble Gas reading ($\mu$Ci/cc).

c. Enter total stack or vent flow (kcfm). Calculate from Figure 4.2 or 4.3.

d. Hit the "F9" Key.

e. Print the results.

3.3 Back Calculation

Use Section 2.5 of this Attachment.

3.4 USAR

Use Section 2.6 of this Attachment.

3.5 Containment High Range Monitor

Use Section 2.7 of this Attachment. Monitor readings are available on the DRMS system (RMS1a,b,c or d), the SPDS display or the 880 panel.

3.6 For liquid releases, consult N2-CSP-LWS-M203

## TABLE 4.1
## FLOW RATES CORRESPONDING TO FAN CONFIGURATIONS FOR UNIT 1

| | |
|---|---|
| Drywell Vent, Purge, and Fill Line (10.00 KCFM) | KCFM |
| Turbine Building High Speed Fans (170.00 KCFM) | KCFM |
| Turbine Building Low Speed Fans (120.00 KCFM) | KCFM |
| Reactor Building High Speed Fans (70.00 KCFM) | KCFM |
| Reactor Building Low Speed Fans (35.00 KCFM) | KCFM |
| Waste Building (8.00 KCFM) | KCFM |
| Waste Building Extension (5.30 KCFM) | KCFM |
| Offgas Building (6.00 KCFM) | KCFM |
| Reactor Building Emergency Vent. (1.60 KCFM) | KCFM |
| RSSB Extension (10.25 KCFM) | KCFM |
| Total Stack Flow | KCFM |

## TABLE 4.2
## FLOW RATES CORRESPONDING TO FAN CONFIGURATIONS FOR UNIT 2 STACK

| CST Room 1 Fan (2200 SCFM) | Stack Substructure 1 Fan (1400 SCFM) | Turbine Building 1 Fan (40,000 SCFM) | Turbine Building 2 Fans (80,000 SCFM) | Standby Gas Treatment (4,000 SCFM) | Nominal SCFM | Nominal $cm^3/sec$ |
|---|---|---|---|---|---|---|
| | | | | X | 4,000 | 1.89 E6 |
| | | X | | | 40,000 | 1.89 E7 |
| | | X | | X | 44,035 | 2.08 E7 |
| | | | X | | 80,000 | 3.78 E7 |
| | | | X | X | 84,000 | 3.96 E7 |
| | X | | | | 1400 | 6.61 E5 |
| X | | | | | 2200 | 1.04 E6 |

## TABLE 4.3
## FLOW RATES CORRESPONDING TO FAN CONFIGURATIONS FOR UNIT 2 VENT

| TB 250' & 306' Decon Rm 1 Fan (3300 SCFM) | Radwaste Liner 1 Fan (800 SCFM) | Radwaste Tanks 1 Fan (4910 SCFM) | Radwaste Building 1 Fan (47,800 SCFM) | Radwaste Building 2 Fans (95,600 SCFM) | Aux Boiler (23,000 SCFM) | Refueling Floor Above (70,000 SCFM) | Refueling Floor Below (70,000 SCFM) | Nominal SCFM | Nominal $cm^3/sec$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | X | | | | | 47,800 | 2.256 E7 |
| | | | | X | | | | 95,600 | 4.512 E7 |
| | | | X | | X | | | 70,800 | 3.341 E7 |
| | | | | X | X | | | 118,600 | 5.597 E7 |
| | | | X | | | X | X | 187,800 | 8.864 E7 |
| | | | | X | | X | X | 235,600 | 1.112 E8 |
| | | | X | | X | X | X | 210,800 | 9.948 E7 |
| | | | | X | X | X | X | 258,600 | 1.22 E8 |
| | | X | | | | | | 4910 | 2.317 E6 |
| | X | | | | | | | 800 | 3.775 E5 |
| X | | | | | | | | 3300 | 1.557 E6 |

## 1.0 DOSE ASSESSMENT

### 1.1 General Considerations

1.1.1 The dose assessment program is called RADDOSE.

1.1.2 Meteorological data is automatically sent to RADDOSE by the Meteorological Monitoring System (MMS). The user can use this data or manually input data.

1.1.3 Source term and release rate determination is identical to that described in Attachment 4.

### 1.2 Dose Assessment Procedure

NOTE: The dose assessment model has many capabilities beyond those used in this procedure. Use the "EDAMS Operators Manual" (available in the EOF) for further reference.

1.2.1 Log on to EDAMS computer using Attachment 2.

1.2.2 Select the affected Unit "Dose Assessment Model."

1.2.3 Utilize "EDAMS Data Entry Form", Figure 5.2, or equivalent.

1.2.4 Select "Begin New Incident" at the options.

1.2.5 Select "Yes" to erase all previous data when prompted.

1.2.6 Enter the following at the Accident Scenario Definition screen:

a. Reactor Trip Date. This is the date that the reactor scrammed or was manually tripped. IF the reactor is not shut down, enter tomorrow's date.

b. Reactor Trip Time (24-hour format). This is the time that the reactor scrammed or was manually tripped.

c. Release Date. This is the date that the release to the atmosphere began, or is projected to begin.

d. Release Time (24-hour format). This is the time that release to atmosphere began or is projected to begin.

e. Enter the lake temperature (deg F). If unknown, hit "Enter" and historical data will be entered.

f. Enter the initials of the user (two or three initials).

g. Verify entries, make any necessary changes, and select accept to continue.

1.2.7 Select "Enter/Edit Source Term Data" from the EDAMS main menu.

NOTES: 1. Use Attachment 4 to obtain the information needed to complete this section.

2. The preferred source of release rate data is the actual isotopic distribution, if available.

a. Select "Accident Type" by choosing the accident that most suits the current conditions. Use Table 5.1 in making the choice.

b. Select "Yes" for elevated releases OR "No" for ground releases when asked, "Is this release Elevated?".

NOTE: "Elevated" releases are releases from the stack. "Ground" releases are from any other release point.

c. Select the "Method" used to determine the release rate by selecting the highlighted cell or by hitting the "F2" key and selecting. Enter the "Flowrate" and "Monitor Reading" if required.

d. Select the Iodine release rate "Method" by selecting the highlighted cell or by hitting the "F2" key. Enter the "Monitor Reading" and "Release Rate" if required.

e. Up to three Accident Types (and therefore three release paths) can be entered. To enter additional release paths, repeat Steps a - d above. When all applicable accident types have been entered, proceed to the next step.

f. Upon completion of this screen, verify data and make any necessary changes before selecting "Accept".

1.2.8 The user will be queried only for the meteorological data required. Enter meteorological data as required:

a. Select "Enter/Edit Meteorological Data", Elevated or Ground as appropriate.

b. If the MMS is available, the data will be automatically displayed for the current time step.

1. Select "Requery MMS".

2. Select "Accept" as necessary.

c. If the MMS is unavailable, enter met data obtained from alternate sources, as outlined in Attachment 3 of this procedure and select "Accept".

1.2.9 Select "Perform Calculations" from the EDAMS main menu and "Verify source term data before calculating "as prompted.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

**CAUTION**

Any calculations performed on actual data shall be verified. The ODAM may act as the checker for calculations performed by the Rad Assessment Staff.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

a. The map of the 10 mile Emergency Planning Zone (EPZ) will appear with centerline dose rates when the calculation is complete.

b. Select "Continue" to go to the output menu.

c. Select "Continue Calculations" from the output menu.

d. Select "Perform Forecast" from the RADDOSE main menu.

e. Verify meteorology and source term data as required.

f. Enter "Forecast Period" (i.e. - release duration). Use 4 hours as a default value.

g. Select "OK".

h. After the forecast map appears select "Continue" to go to the output menu.

i. Select "Go to Report Menu".

j. Select "Print 10-Mile ERPA Map".

k. Select "Print Complete Dose/Dose Rate Report".

ℓ. Attach results of Step 1.2.9.j and k to EDAMS Data Entry Form, Attachment 5.2 or equivalent.

m. Verify that any results are supported by radiological and plant conditions. Consider:

- Core damage
- Drywell high range monitor readings
- Effluent monitor readings
- Inplant radiological conditions
- Containment hydrogen monitor readings

n. Document the verification of the calculation using the signature lines on Figure 5.2 or equivalent.

## 2.0 REFINED PROTECTIVE ACTIONS

2.1 These actions are initiated for the purpose of verifying the adequacy of PARs made using Attachment 1 of this procedure **OR** to develop PARs using projected doses obtained from Attachment 5, Step 1.2.9 of this procedure.

2.2 In determining PARs based on dose assessment, carefully consider factors such as release duration and Evacuation Travel Time Estimates (ETTE). (For example, puff releases may yield doses in excess of Protective Action Guidelines for an evacuation, but the plume will pass before an evacuation could be completed). ETTEs are available in the EOF.

**NOTE:** County and State PARs take many factors into account that NMP procedures do not (i.e. - road conditions, special population needs, evacuation scenarios, and shelter vs evacuation doses). Therefore, differences in PARs may occur. The ODAM must account for differences in PARs, when those differences exist. This can be accomplished via consultation with County and State representatives in the EOF as to the assumptions used in their dose calculations and PAR development.

2.3 Obtain dose projection for each ERPA.

2.3.1 PARs are listed on the 10 mile ERPA map obtained per Attachment 5, Step 1.2.9. j.

2.3.2 The following criteria are used in determining the PAR for each ERPA.

| PAR | TEDE (rem) | $CDE_T$ (rem) |
|---|---|---|
| Evacuate | > 1 | > 5 |

2.3.3 Record the PAR for each ERPA on the Part 1 Notification Form and give to the CED for approval.

2.3.4 PARs that have been made previously must be accounted for when PARs are revised. For example, if a PAR to evacuate an ERPA was previously made to the State/County and that PAR does not appear on a revised map from 1.2.9.j, that PAR must still be included on the revised recommendation to the State/County.

2.3.5 If projected doses exceed values listed in Attachment 5 Step 2.3.2 for distances greater than 10 miles, PARs shall be made using convenient geographic boundaries (such as townships).