Niagara Mohawk

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United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

RE: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Nine Mile Point Unit 2
Docket No. 50-410
NPF-69

Gentlemen:

Enclosed please find a copy of the following emergency procedure revision for Niagara Mohawk's Nine Mile Point Nuclear Station:

EPIP-EPP-08, Revision 10, "Off-Site Dose Assessment and Protective Action Recommendation"

This procedure revision is being submitted as required by Section V to Appendix E of 10CFR Part 50. Should you have any questions, please feel free to contact Mr. James D. Jones, Director of Emergency Preparedness at (315) 349-4486.

Very truly yours,

John T. Conway
Vice President Nuclear Generation

/nab

Enclosure

xc:
Mr. H.J. Miller, Regional Administrator, Region I (2 copies)
Ms. M.K. Gamberoni, Section Chief PD-I, Section 1, NRR (letter only)
Mr. G.K. Hunegs, Senior Resident Inspector (1 copy)
Mr. P.S. Tam, Senior Project Manager, NRR (1 copy)
EP PPF

A045

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

EMERGENCY PLAN IMPLEMENTING PROCEDURE

EPIP-EPP-08

REVISION 10

OFF-SITE DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATION

TECHNICAL SPECIFICATION REQUIRED

Approved by:
L. E. Pisano

Manager - Nuclear Training

16 Oct 00
Date

THIS IS A FULL REVISION

Effective Date: 10/19/2000

PERIODIC REVIEW DUE DATE: OCTOBER 2001

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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. 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

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

   1. Preparing for the dispatch of downwind survey teams.

   2. Aware of meteorological advisor status.

d. 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. Perform dose assessment calculations and 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.

3.2.1 (Cont)

f. Complete Part 2 Notification Fact Sheet in accordance with EPIP-EPP-23.

g. 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.

h. 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.

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

j. Provide CED with pertinent information as needed.

   1. Changing radiological conditions that may lead to PARs.

   2. Protective actions for site staff.

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

3.2.2 <u>EOF Dose Assessment Staff</u>

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

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

5.4 <u>Policies, Programs, and Procedures</u>

5.4.1 EPIP-EPP-07, Downwind Radiological Monitoring

5.4.2 EPIP-EPP-15, Health Physics Procedure

5.4.3 EPIP-EPP-23, Emergency Personnel Action Procedures

5.5 <u>Commitments</u>

DER C-95-0693 (for Attachment 3)

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:

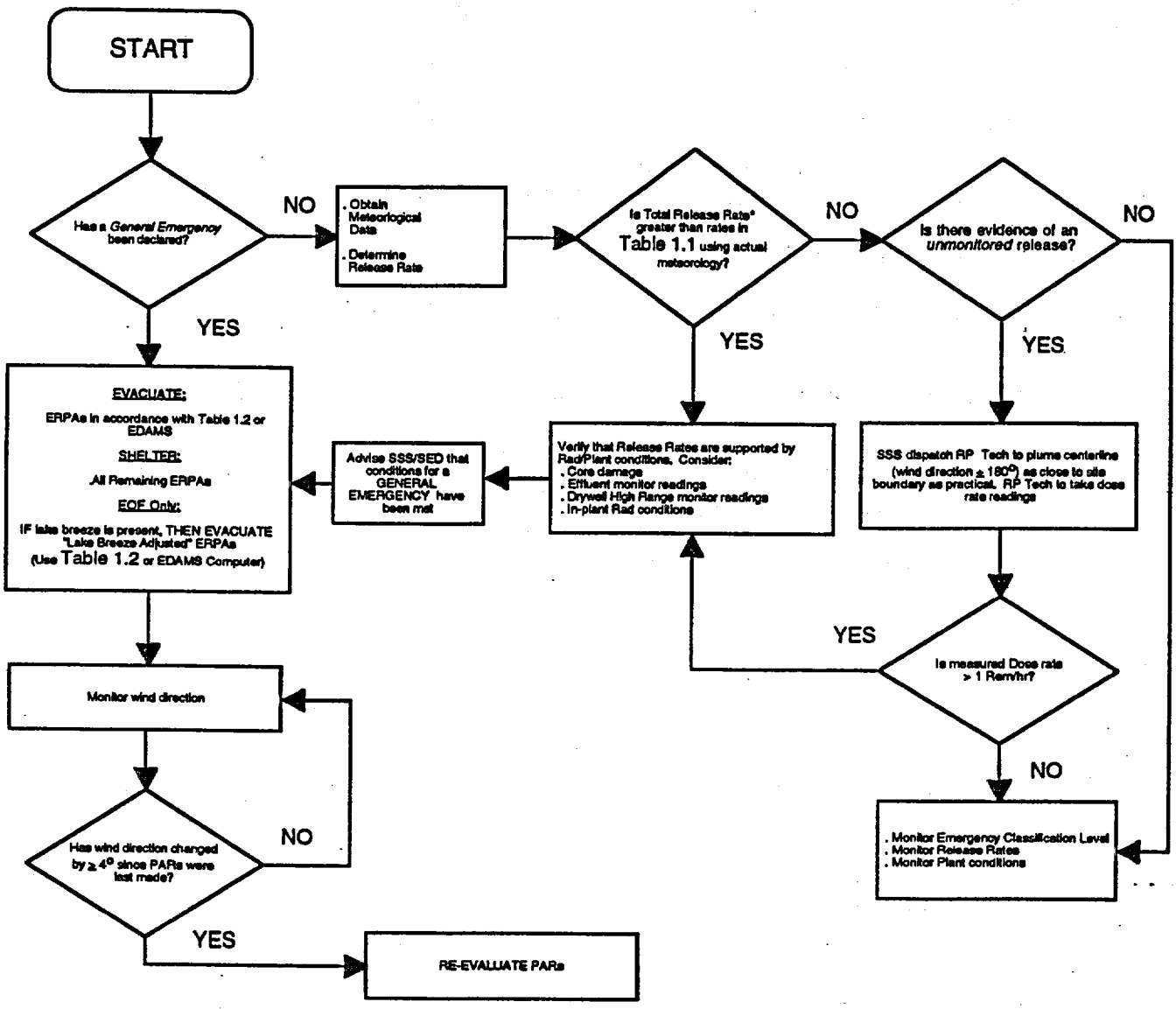
NOTE: For records generated due to an actual declared emergency only.

- 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		14, 29	
223 to 233		14, 29	4, 7
234 to 240	7	14, 15, 29	4
241 to 254	4, 7	14, 15, 29	9
255 to 262	4, 7	14, 15, 16, 17, 29	9
263 to 278	4, 7, 9	8, 14, 15, 16, 17, 29	5
279 to 292	4, 5, 7, 9	8, 14, 15, 16, 17, 18, 29	10
293 to 305	4, 5, 7, 9, 10	8, 14, 15, 16, 17, 18, 29	
306 to 311	4, 5, 7, 9, 10	8, 14, 15, 16, 17, 18, 19, 20, 29	
312 to 332	4, 5, 7, 9, 10	8, 14, 15, 16, 17, 18, 19, 20	6, 11
333 to 340	4, 5, 9, 10, 11	8, 15, 16, 17, 18, 19, 20, 21, 25	6, 7, 12
341 to 349	4, 5, 9, 10, 11	8, 17, 18, 19, 20, 21, 24, 25,	6, 7, 12
350 to 356	5, 6, 9, 10, 11	8, 13, 18, 19, 20, 21, 22, 24, 25, 12	4, 7
357 to 12	5, 6, 9, 10, 11	13, 18, 19, 20, 21, 22, 23, 24, 25, 12	4
13 to 20	5, 6, 10, 11	13, 18, 19, 20, 21, 22, 23, 24, 25, 12	4, 9
21 to 51	5, 6, 10, 11	13, 19, 20, 21, 22, 23, 24, 25, 28, 12	9
52 to 56	5, 6, 11	13, 19, 20, 21, 22, 23, 24, 28, 12	10
57 to 61	5, 6, 11	13, 19, 21, 22, 23, 24, 28, 12	10
62 to 70	6, 11	13, 19, 21, 22, 23, 24, 28, 12	10
71 to 89	6	13, 21, 22, 23, 24, 28, 12	11
90 to 95	6	28	5, 11, 12
96 to 114		28	6, 12
115 to 146		28	
147 to 213		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

Site Boundary Map

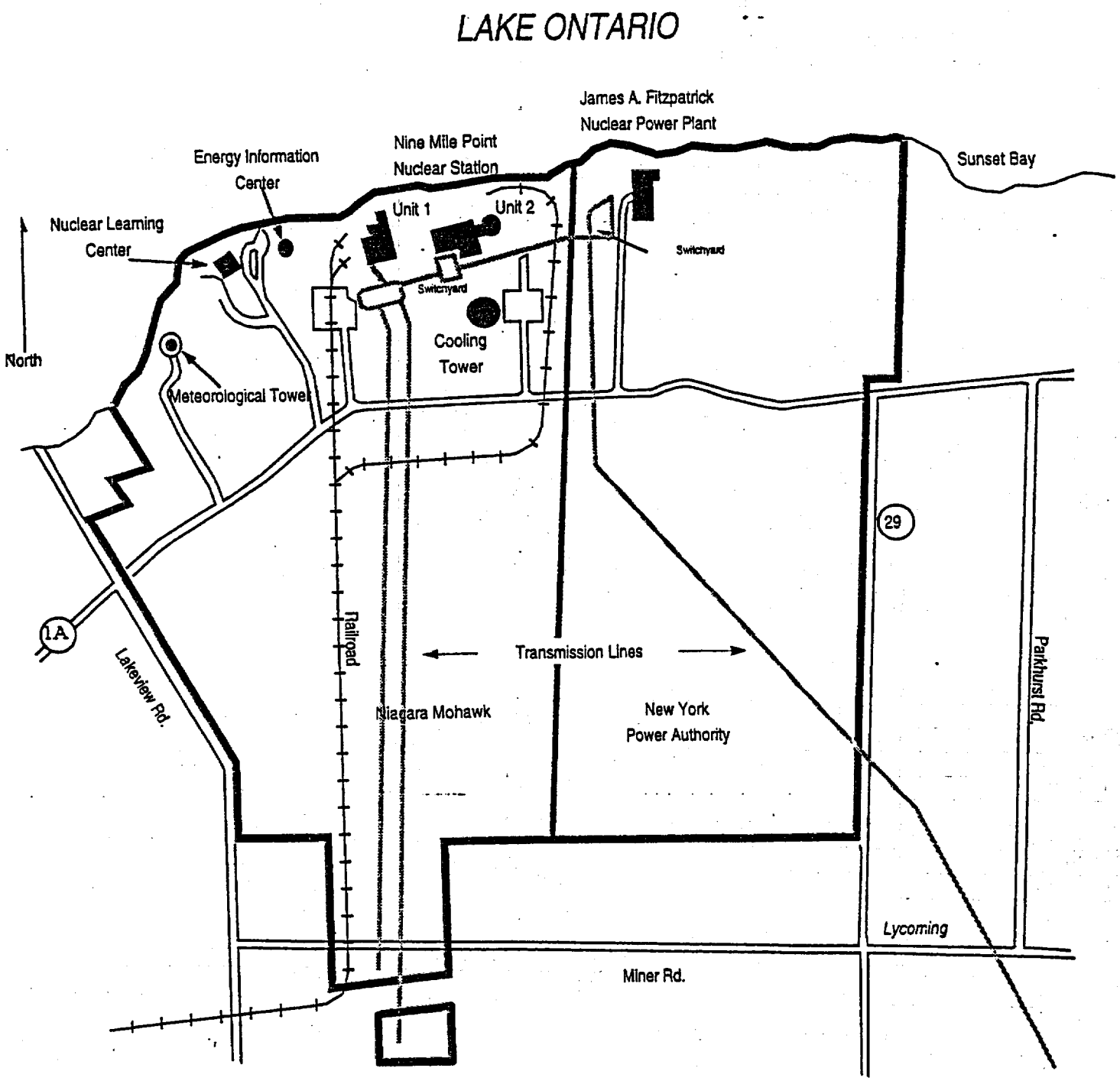
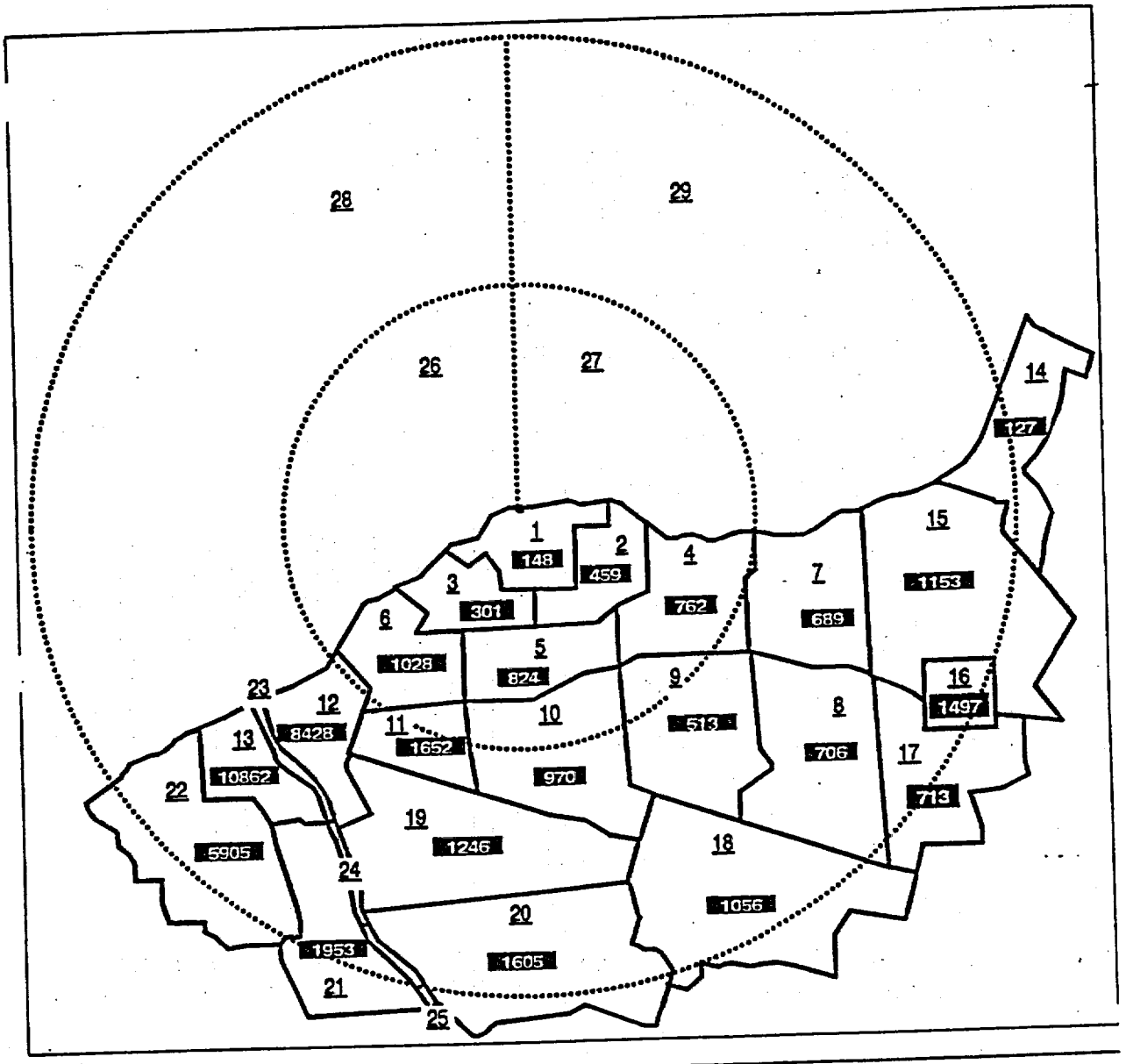


FIGURE 1.5 - ERPA Map



LEGEND 1 ERPA Number 148 ERPA Population

Emergency Response Planning Areas (ERPA)

with 1991 Population Estimates

1.0 CONTROL ROOM EDAMS

1.1 If necessary, 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 "Continue" or hit the enter key.
d. Select "Direct Connect to Met Data".
e. Once Login is successful/complete, select "OK".
f. 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", and select "number to dial" from the drop down box. Repeat with different number if necessary.

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

d. If the laptop should fail, have 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 If necessary, 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 "Continue" or hit the enter key.
d. Select "Automatic Dial-In to Met Data"
e. Once Login is successful/complete, select "OK".
f. Select 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 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.

ATTACHMENT 3: METEOROLOGICAL DATA ACQUISITION

1.0 OBTAINING METEOROLOGICAL DATA

NOTE: The Meteorological Advisor may use the following steps or skills of the trade to obtain meteorological data.

1.1 Obtain ground/elevated meteorological data appropriate to the radiological release point in the order listed below. If no release is in progress, or the release path is unknown obtain the elevated data.

A. EDAMS (see Section 2.0 of this Attachment)
B. Strip chart recorder (see Section 3.0 of this attachment)
C. Manual input from alternate sources (see Section 4.0 of this attachment)

1.2 **EOF only** - Determine if Lake Breeze or Land Breeze is a possibility in accordance with Figures 3.2 and 3.3.

1.3 **EOF only** - If using the main tower and wind direction is between 0° and 100° or if using the backup tower and wind direction is between 220° and 270° notify the ESSTC and ODAM that the plume may arrive sooner than the wind speed would indicate.

1.4 Repeat Section 1.0 every 15 minutes.

2.0 USING EDAMS TO OBTAIN METEOROLOGICAL DATA

2.1 Log in the EDAMS computer in accordance with Attachment 2 of this procedure.

2.2 Select "Emergency Meteorological Report" to obtain meteorological data.

2.3 Select "Print Met Data" to print the data, as required.

2.4 Determine whether to use ground or elevated data in accordance with Step 1.1.

2.5 Use data as obtained; data may be recorded in Table 3.7.

2.6 If data is not available through the EDAMS computer, proceed to Section 3.0.

3.0 USING STRIP CHART RECORDERS TO OBTAIN METEOROLOGICAL DATA

* *

CAUTION

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

* *

NOTE: Use this method only if the method described in Section 2.0 of this attachment is unavailable. If the strip chart data is unavailable, proceed to Section 4.0.

3.1 Locate the chart recorders in the Unit 1 or 2 Control Rooms or the TSC.

NOTES:

1. Figure 3.4 shows a sample strip chart trace of air temperature, 100' ΔT, 200'ΔT, and $\sigma\theta$ and Figure 3.5 shows a sample of wind speed and wind direction data.

2. The Meteorological Advisor may use the following steps or skills of the trade to obtain meteorological data.

3.2 Apply the hierarchy in accordance with Table 3.1 to determine what data to obtain.

TABLE 3.1

Parameter	Hierarchy	Elevated Release	Ground Release
Wind Speed & Direction	Primary	200' Main	30' Main
	Substitutes	100' Main	
		JAF Backup	
		30' Main	200' Main
Stability	Primary	200' ΔT	100' ΔT
	Substitute	100' ΔT	200' ΔT
		200' $\sigma\theta$(1)	30' $\sigma\theta$(1)
		100' $\sigma\theta$(1)	
		JAF Backup $\sigma\theta$	
		30' $\sigma\theta$(1)	200' $\sigma\theta$(1)

(1) If using 30', 100' or 200' $\sigma\theta$ stability, AND the wind is form a direction listed is Step 3.13, THEN substitute the next source of data in accordance with this step.

3.3 If substitute data is to be used consult the meteorological advisor if available; otherwise use the data as obtained.

3.4 Determine wind direction as follows:
a. Locate the wind direction trace
b. Estimate the average wind direction over the last 15 minutes; data may be recorded in Table 3.7.

3.5 Determine wind speed as follows:
a. Locate the wind speed trace
b. Estimate the average wind speed over the last 15 minutes; data may be recorded in Table 3.7.

3.6 Determine ΔT as follows:
a. Locate the ΔT
b. Estimate the average ΔT over the last 15 minutes.
c. Compare ΔT values to the Stability Classification chart (Table 3.6).
d. Select the appropriate stability class (For 200' ΔT use column 6 and for 100' ΔT use column 4); data may be recorded in Table 3.7.

3.7 If ΔT values are not available, then locate the $\sigma\theta$ from the main or backup tower recorder.

3.8 If using 30', 100', or 200' $\sigma\theta$ stability and the wind is reading from a direction listed below, substitute the next stability source in accordance with Table 3.1.

Main Tower $\sigma\theta$ Stability	Wind Direction
200'	030° to 096°
100'	030° to 077°
30'	035° to 076°

3.9 Compare the value of $\sigma\theta$ to Table 3.6 (Column 5)

3.10 Select the appropriate stability class (Column 3); data may be recorded in Table 3.7.

3.11 If using JAF Backup $\sigma\theta$ stability, the following adjustments should be made:

JAF Backup Tower Wind Direction	JAF Backup $\sigma\theta$ Stability Adjustment
232° to 246° or 270° to 281°	Add one stability class, such that: A→B B→C C→D D→E E→F F or G→G
247° T 269°	Add two stability class, such that: A→C B→D C→E D→F E, F or G→G

3.12 If neither ΔT or $\sigma\theta$ is available, observe the wind direction trace (200' for elevated data or 30' for ground data or substitute per Table 3.1) over the last 15-minute period.

3.13 Estimate $\sigma\theta$ from the trace by dividing the horizontal deviation of the wind direction trace (over the last 15 minutes) by 6. To make reading the chart easier, you may want to advance the chart.

3.14 Compare this calculated value to Table 3.6 (Column 5).

3.15 Select the appropriate stability class (Column 3); data may be recorded in Table 3.7.

4.0 MANUAL INPUT FROM ALTERNATE SOURCES

NOTE: Use this data only if the methods described in Section 2.0 and 3.0 unavailable.

* *

CAUTION

Data obtained by the following methods may not be site-representative and may introduce errors into dose assessments. The Meteorological Advisor should be consulted regarding the use of all substitute data. Use the data as obtained if the Meteorological Advisor is not available.

* *

4.1 To obtain National Weather Service (NWS) Meteorological Data
- a. Telephone the NWS in Buffalo at 800-462-7751 or 716-565-9001.
- b. Request the current wind speed, direction, stability class, and temperature.
- c. Use the data as follows:
  1. Wind speed = elevated and ground wind speed
  2. Wind Direction = elevated and ground wind direction
  3. Stability Class = elevated and ground stability classes
  4. Temperature = ambient temperature

4.2 EOF Only - (Directions for the following may be found at the EOF at the Meteorological Advisor Station.)
Other sources of meteorological data that may be utilized are:

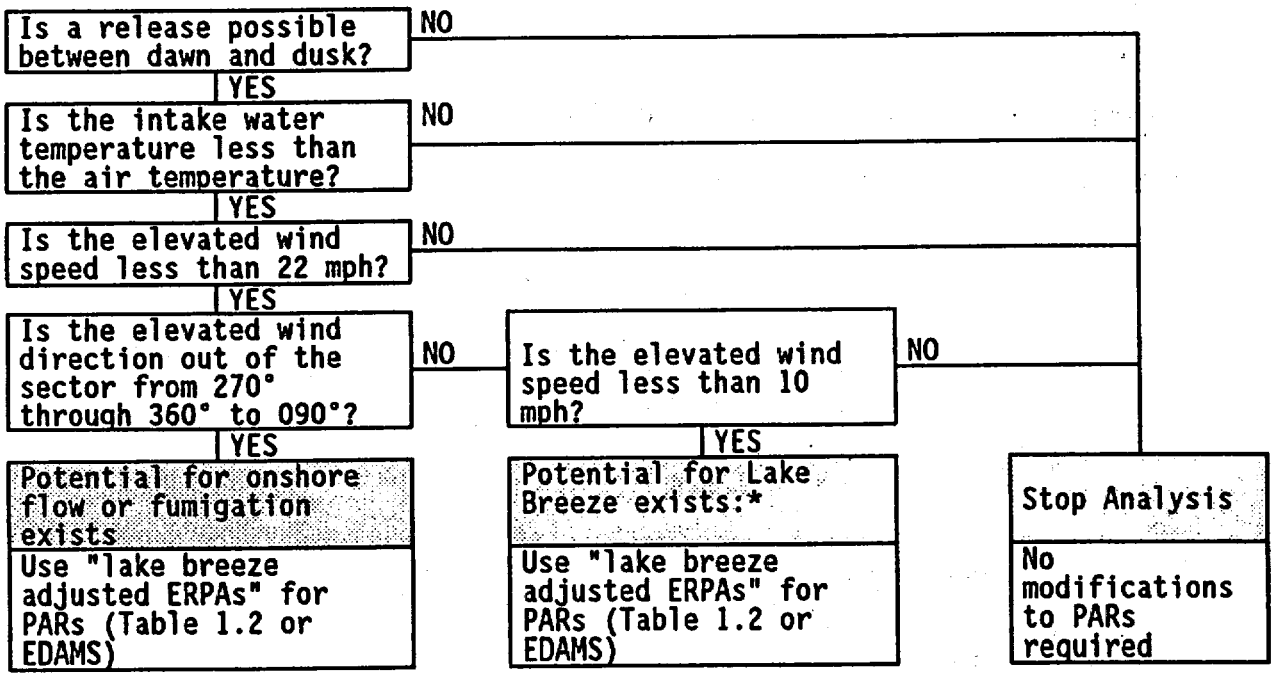
1. SODAR
2. Other Meteorology towers
3. Commercial weather services
4. Meteorological Advisor only - Characterization tables
5. Meteorological Advisor only - Skills of the trade

4.3 Once the data is obtained Table 3.7 may be used to record the values.

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

EOF only - Refer to the following step and the flowchart below to determine if a lake breeze is a possibility.

1. Obtain meteorological data in Section 1.0 of this attachment.
2. Obtain lake temperature from Unit 1 or 2 process computer, control rooms, EDAMS, or meteorological advisor (if available).
3. Follow the flowchart answering the appropriate questions.

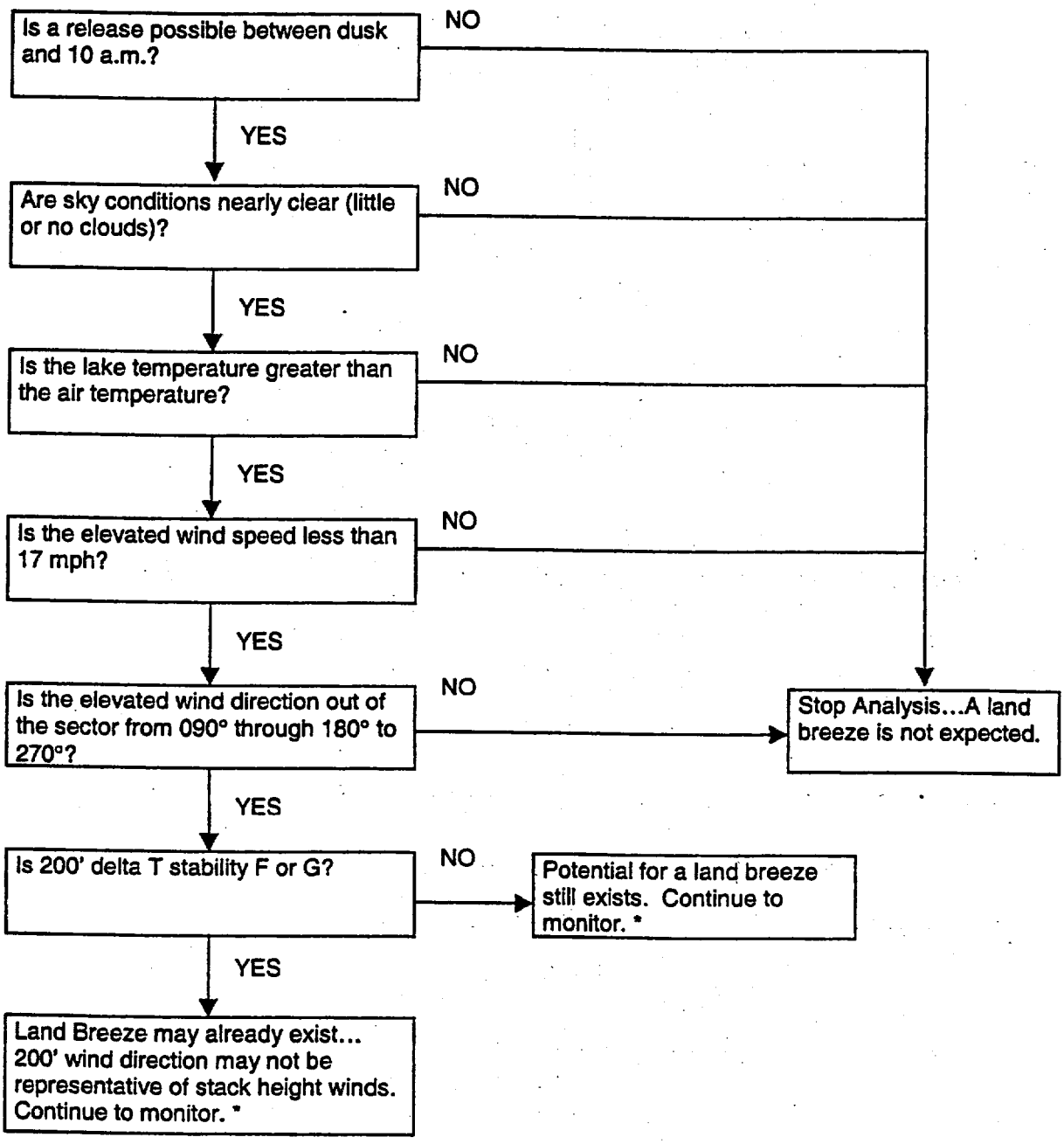


* **NOTE**: There is a potential for a shift in wind direction to 245° through to 065° if the lake breeze has not already formed.

FIGURE 3.3
LAND BREEZE FLOW CHART

EOF only - Refer to the flowchart below to determine if a land breeze is a possibility.

1. **Obtain meteorological data in accordance with Section 1.0 of this Attachment.**
2. **Obtain lake temperature from Unit 1 or 2 process computer, control rooms, EDAMS or meterorological advisor (if available).**
3. **Follow the flowchart answering the appropriate questions.**



*NOTE: There is a potential for a shift in wind direction to 090° through 180° to 270°.

FIGURE 3.4
Sample Air Temperature, Delta Temperature and Sigma Theta Trace
Control Room

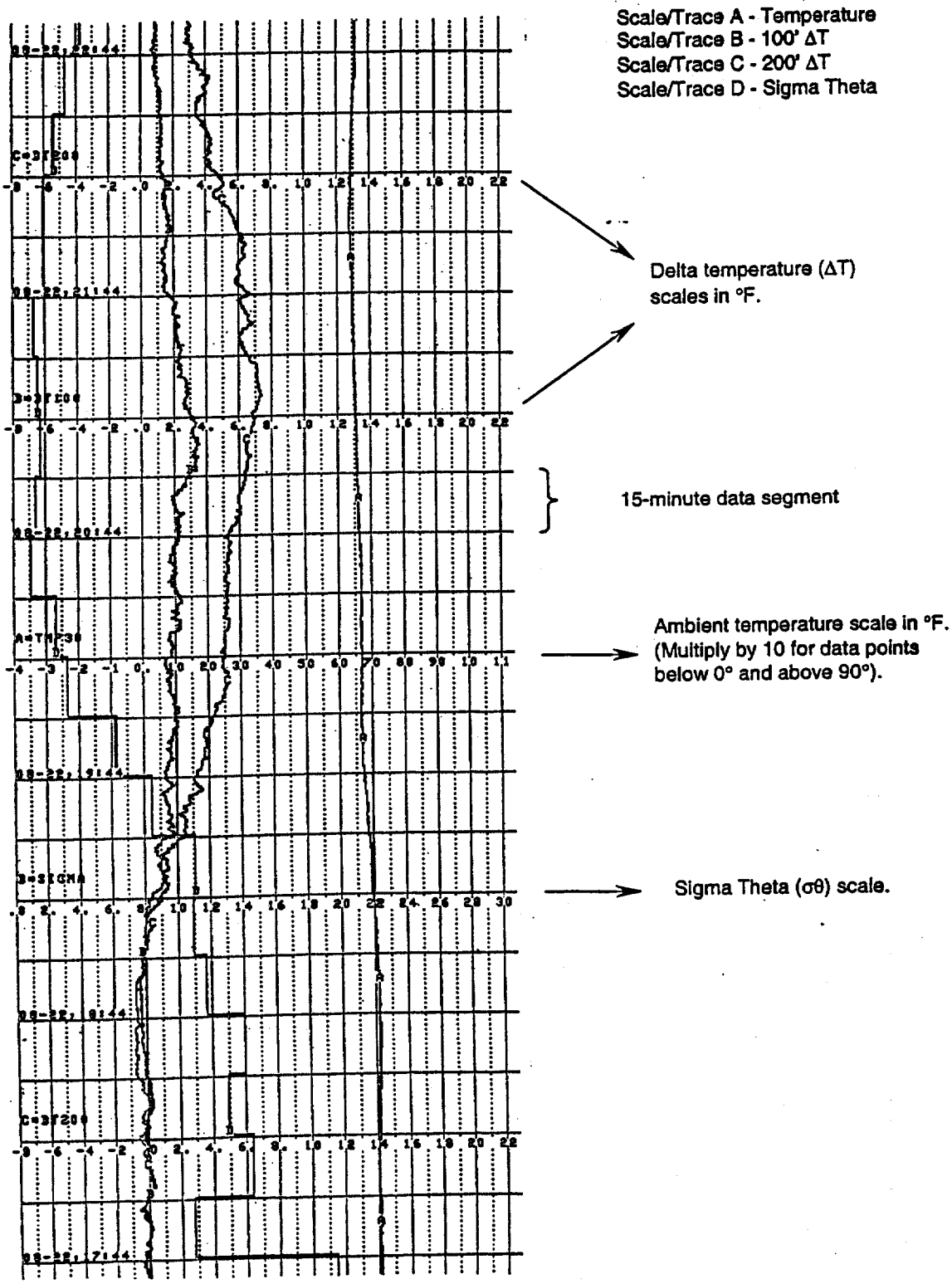


Figure 3.5
Sample Wind Speed and Wind Direction Trace
Control Room and TSC

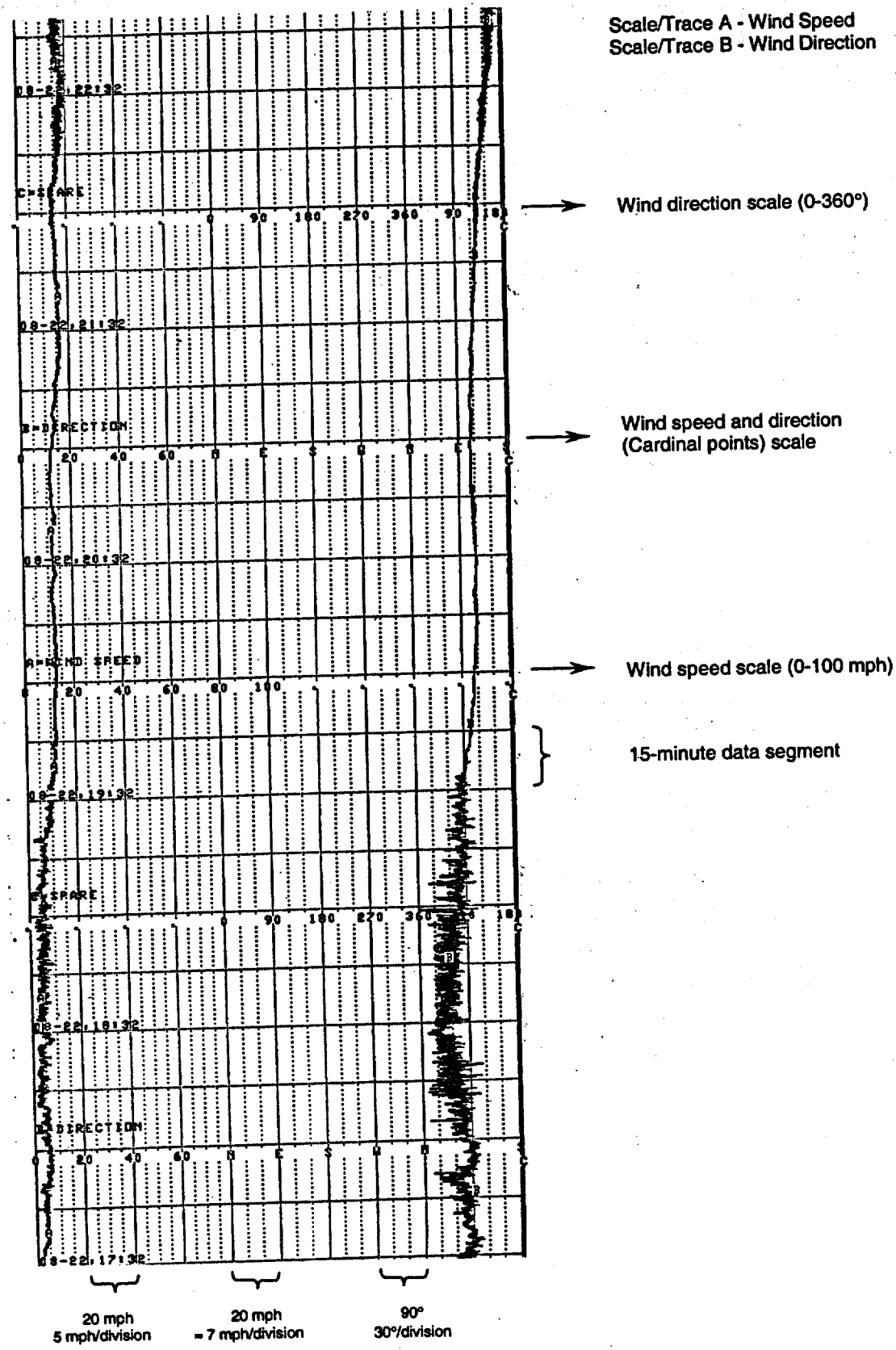


TABLE 3.6 - Stability Classification Chart

1	2	3	4	5	6
STABILITY CLASSIFICATION	NMPC TURBULENCE CLASS	PASCAL STABILITY CLASS	TEMP CHANGE WITH HEIGHT, °F/72ft(1)	σ_θ DEGREES RANGE OF VALUES(2)	TEMP CHANGE WITH HEIGHT, °F/168ft(3)
Extremely Unstable	I	A	$\Delta T/\Delta Z \leq -0.75$	$22.5 \leq \sigma_\theta$	$\Delta T/\Delta Z \leq -1.75$
Moderately Unstable	II	B	$-0.75 < \Delta T/\Delta Z \leq -0.67$	$17.5 \leq \sigma_\theta < 22.5$	$-1.75 < \Delta T/\Delta Z \leq -1.57$
Slightly Unstable	II	C	$-0.67 < \Delta T/\Delta Z \leq -0.59$	$12.5 \leq \sigma_\theta$ 17.5	$-1.57 < \Delta T/\Delta Z \leq -1.38$
Neutral	III	D	$-0.59 < \Delta T/\Delta Z \leq -0.20$	$7.5 \leq \sigma_\theta < 12.5$	$-1.38 < \Delta T/\Delta Z \leq -0.46$
Slightly Stable	IV	E	$-0.20 < \Delta T/\Delta Z \leq 0.59$	$3.8 \leq \sigma_\theta < 7.5$	$-0.46 < \Delta T/\Delta Z \leq 1.38$
Moderately Stable	IV	F	$0.59 < \Delta T/\Delta Z \leq 1.58$	$2.1 \leq \sigma_\theta < 3.8$	$1.38 < \Delta T/\Delta Z \leq 3.69$
Extremely Stable	IV	G	$1.58 < \Delta T/\Delta Z$	$\sigma_\theta < 2.1$	$3.69 < \Delta T/\Delta Z$

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

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, wind usually are 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 round, 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 round, winds less than 10 miles per hour.

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

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

Table 3.7: MANUAL MET DATA WORKSHEET

Date/Time	Release Height (circle one)	Source of Data (circle one)	Wind Direction (degrees)	Wind Speed (mph)	Stability Class
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			
	Elevated/Ground	EDAMS/Strip Chart/Other			

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.

e. Assess all calculated release rates against Tech Spec limits by implementing Attachment 4a.

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. Obtain dilution information from Chemistry Technician at RAGEMS skid or Chemistry Technician in Control Room AND 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.

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 (μCi/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. If this method is to be used to make an initial determination of release rate, then back calculate using EDAMS (not Raddose). This value can then be input into Raddose in accordance with Attachment 5 of this procedure.

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

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

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

2.5 (Cont)

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

f. 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.

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

h. Hit the "F9" key.

i. 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

NOTES:

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

2. The following may be used for this calculation:

- Unit 1 primary containment free-air volume = 314,000 ft^3
- Tech Spec leakage from primary containment = ~1%/day

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.

2.7 (Cont)

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 (μCi/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 (μCi/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

NOTES: 1. This method is only valid if the monitor is able to "see" the release. Therefore, consult Operations personnel on the validity of monitor readings.

2. The following may be used for this calculation:

- Unit 2 primary containment free-air volume = 497,000 ft^3
- Tech Spec leakage from primary containment = ~1%/day

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

ATTACHMENT 4A: Determination of Percent of Technical Specification Radiological Release

Procedure:

1. Determine release rate in accordance with Attachment 4 of this procedure.

2. Complete the following as applicable:

   a. Unit 1 Stack release:

      1. assume calculated stack release rates represent Noble Gas release rates
      2. calculate:

         % Tech Spec = Noble Gas release rate (Ci/sec) _____x 4831

         % Tech Spec = _____

   b. Unit 1 Emergency Condenser (EC) Vent release:

      1. calculate:

         % Tech Spec = EC Vent monitor reading (mr/hr) _____x 5

         % Tech Spec = _____

   c. Unit 2 Stack release:

      1. assume calculated stack release rates represent Noble Gas release rates
      2. calculate:

         % Tech Spec = Noble Gas release rate (Ci/sec) _____x 1042

         % Tech Spec - _____

   d. Unit 2 Vent release:

      1. assume calculated stack release rates represent Noble Gas release rates
      2. calculate:

         % Tech Spec = Noble Gas release rate (Ci/sec) _____x 3704

         % Tech Spec = _____

3. IF any % Tech Spec from any source is > 100% Tech Spec, THEN advise the SSS/ED or the ODAM that a release that exceeds Tech Specs has taken place.

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 "Y" for elevated releases OR "N" 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 "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 "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, then enter both ground and elevated 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.

1.2.9 (Cont)

NOTE: The purpose of the following steps is to determine the projected avoidable dose resulting from the incident.

* *

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 "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.

1.3 If it is desired to utilize EDAMS to track near real-time doses, then perform the following steps:

* *

CAUTION

The results of this step shall NOT be utilized to determine PARs.

* *

1.3.1 Enter accident, source term and meteorological data in accordance with Steps 1.2.1 through 1.2.8 of this attachment.

1.3.2 Select "Perform Calculations" from the EDAMS main menu.

1.3.3 Enter meteorological and source term data at 15 minute intervals.

1.3.4 Determine dose at any time by viewing displayed 10 mile ERPA map.

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).

TABLE 5.1 - FSAR/USAR ACCIDENT TYPE

Accident Type	Noble Gas Release Rate (Ci/s)	Iodine Release Rate (Ci/s)	Analyzed Release Point
Unit 1:			
DBA Loss of Coolant	5.50E+0	4.53E-3	Elevated
Control Rod Drop	2.51E+1	6.03E-5	Elevated
Refueling Accident	3.78E-2	3.84E-5	Elevated
Steam Line Break	6.36E+0	4.86E+1	Ground
Loss of Coolant (Realistic)	1.79E-3	1.00E-6	Elevated
Unit 2:			
DBA Loss of Coolant	1.03E+1	2.03E-1	Elevated
Control Rod Drop	4.22E-2	4.70E-4	Ground
Refueling Accident	1.77E+1	1.65E-1	Ground
Steam Line Break	3.64E+0	1.22E+2	Ground
Rad Gas Waste System Leak	4.06E+0	0.00	Ground
Instrument Line Failure	0.00	2.17E-2	Ground
Fuel Cask Drop	2.06E+0	2.68E-3	Ground
Loss of Coolant (Realistic)	1.05E-2	2.38E-5	Elevated

NIAGARA MOHAWK

CHRONOLOGICAL RELEASE RATE LOG

Date:	Release Form:	Survey Location:	Completed By:

Effluent Monitor Data				Environmental Sampling Data								Release Log			
Time of Monitor Reading	Monitor System	Release Rate (Ci/sec)	Duration of Release	Survey Time	Location	Gamma Dose Rate (mR/hr)	Distance (Mi)	Wind Speed (mph)	*** Transit Time (min)	**** Est. Time of Release from Site	Release Rate (Ci/sec)	Assigned Release Rate (Ci/sec)	Assigned Time Interval Start	Stop	ODAM Review

Notes: *** Transit Time (min) = (Distance/Wind Speed) x 60 min/hr **** Est. Time of Release = Survey Time - Transit Time

☐ "What If"
☐ Actual Data (Checker Required!)

Rx Trip: Date: _____ Time: _____
☐ Unit 1 ☐ Unit 2

Release:
Release Duration (Hr): _____

Accident Type	Release Point *(Circle One)*
Containment DBA	Elev/Grd
Control Rod Drop	Elev/Grd
Refueling Accident	Elev/Grd
Steam Line Break	Elev/Grd
Loss of Coolant	Elev/Grd
Rad Gas Waste System	Elev/Grd
Inst. Line Failure	Elev/Grd
Fuel Cask Drop	Elev/Grd
Severe Accident	Elev/Grd

Flow Rate _____

Method _____

Monitor Reading _____

Iodine Method _____

Iodine Monitor _____

Met Data: ☐ Automatic ☐ Manual *(Below)* Lake Temp ___°F or Default

	Elevated	Ground
Wind Speed (mi/hr)		
Wind Direction (from - degrees)		
Stability (A-G)		
Temperature (°F)		
Precipitation (in/15 min)		

Attach:
- Map from color printer
- "Complete Dose/Dose Rate" report

Misc: _____

Calculations Performed By: _____

Calculations Verified By: _____