Resolution to NMP-1 Question SRO #25

Original Question:

Emergency events are in progress:

- (08:00) General emergency declared.
- (08:12) Notification sent with wind direction from 304°.
- (08:42) EOF is manned including county and state representatives.
- (08:52) Radiological Assessment Manager reports radiation levels up to 1 REM TEDE are projected outward to 10.2 miles from the site.
- (08:52) Wind direction HAS SHIFTED and is now from 278°.

Which one of the following is the correct information to be communicated to the EOF regarding protective action recommendations?

A. Continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships. Additional Evacuations are not required.
B. Continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships. Additional evacuations are being recommended for MEXICO and RICHLAND townships.
C. Some evacuations in SCRIBA Township will be discontinued. Continue the previously recommended evacuations in NEW HAVEN Township. Additional Evacuations are not required.
D. Some evacuations in SCRIBA Township will be discontinued. Continue the previously recommended evacuations in NEW HAVEN Township. Additional evacuations are being recommended for MEXICO and RICHLAND townships.

Original Answer: B

LICENSEE'S JUSTIFICATION FOR CHANGE

The flaw stems from the ambiguity in the 3rd bullet that states:
"(08:52) Radiological Assessment Manager reports radiation levels up to 1 REM TEDE are projected outward to 10.2 miles from the site." More specifically – *"...up to 1 REM TEDE projected outward to 10.2 miles..."*

The author of the question assumed that the applicants look at the calculation as a linear function and assumed that the applicants would determine that 1 REM TEDE would be exceeded. A faulty mental model during question development and review failed to take into account any meteorological conditions.

In accordance with EPIP-EPP-08 the criteria used to determine PAR for each ERPA is Evacuate when TEDE is >1 (greater than). This can be found in several sections including: Step 3.1.1. j. 3., Attachment 1 Flow chart (not provided during exam) and Table 1.3, Attachment 5 step 2.3.4

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
j. IF an unmonitored atmospheric release is suspected or known to be in progress, then assist the SSS/ED in the following actions:
1. Advise the SSS/ED 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 practical. 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.

TABLE 1.3 - EPA 400 Protective Action Guidelines (EPA PAGs)		
PAR)	TEDE (rem	) CDE_T (rem
Evacuate	> 1	> 5

Attachment 5

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. Once a PAR is transmitted to the State/County, it shall not be changed.

To select between answer A and B, evaluation of the following data is required:
"radiation levels are **up to** 1 REM" ... "**outward to** 10.2 miles".
There are multiple assumptions that can be made based on the given conditions. Since evacuation of any ERPA or areas beyond 10 miles is based on the dose projection for that specific area and no areas are stated as being greater than 1 REM then it cannot assumed there is an area or multiple areas above 1 REM closer to the plant OR farther from the plant. Dose closer to the plant or beyond 10 miles could be in excess or less than 1 REM based on specific environmental conditions not given in this question such as rain in Mexico beyond a 12 mile radius could be the cause of the readings up to 1 REM at 10.2 miles. Dose 'outward to' 10.2 miles implies that surveys have been done starting at the plant and traveling away from the plant. Downwind survey teams would be initially dispatched from the plant and with the given wind direction the downwind ERPAs (14 & 15) extends outward in excess of eleven (11) miles (see EPIP-EPP-07 Att 3 and attached EPZ figure). 1 REM would be a very significant dose at 10.2 miles and if treated as a point source toward the plant you could have deadly dose rates inside the plant. Dose projections are not treated solely as a point source – meterological conditions and downwind surveys or EDAMS projections are used to project dose. The fact is that dose rates are **NOT** exceeding 1 REM as reported by the RAM and given in the question stem (without any assumptions added). Therefore no additional PARs are recommended by the flow chart in Attachment 1 or per Attachment 5 for any ERPA or areas beyond 10 miles.

The attached printout from the EDAMS computer provides indication that dose rates at a greater distance from the source can be greater than the source when taking into account meterological conditions.

On the basis of the above information the facility recommends that question 25 of the SRO exam has 2 correct answers:

A. Continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships. Additional Evacuations are not required.
B. Continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships. Additional evacuations are being recommended for MEXICO and RICHLAND townships.

LICENSEE'S SECOND JUSTIFICATION FOR CHANGE

This supercedes the NRC INITIAL WRITTEN EXAMINATION POST-EXAMINATION ANALYSIS submitted on 10 December, 2004.

SUMMARY

Per NUREG-1021, Rev 9 Sections ES-402 and ES-501, the facility submits the following NRC INITIAL WRITTEN EXAMINATION POST-EXAMINATION ANALYSIS for your review and consideration.

The facility proposes that question 25 of the SRO examination has Distractor "a" as the correct answer. This change will affect the grades of the SRO applicants.

Problem Statement:
Keyed Answer (b) is incorrect. Distractor "a" is the correct answer

The following statements used to justify "b" as the correct answer are incorrect:
"If dose at 10 miles is projected to meet or exceed 1 rem TEDE or 5 rem CDE (Thyroid), then make protective action recommendations and recommend evacuation to that distance in the affected areas."
*The criterion identified in EPIP-EPP-08 R15 clearly defines the threshold value to be **greater than** 1 rem TEDE or **greater than** 5 rem CDE. The question stem clearly indicated values less than or equal to 1 rem TEDE. This fact alone means that EPIP-EPP-08 does not require any ERPAs or areas at 10.2 miles distance from the plant to be evacuated. A follow-up interview with a member of the Emergency Planning Organization (John Kaminski), supports the requirements to use field survey data for EPRA recommendations and not assumed or extrapolated dose information.*

"Therefore, continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships for ERPA 1,2,3,4,5,7,9,10 although the new ERPAs based on the windshift are 1,2,3,4,7 and NOT 5 and 9."
The previous PARS implied in the question stem are to evacuate ERPAs 1, 2, 3, 4, 5, 7, 9, 10, 26,

*& 27 for a wind direction of 304°. With the wind shifting to 278° , the affected ERPAs are 1, 2, 3, 4, 7, 9, 26, & 27. ERPAs 5 and **10** are not affected but will still be included per EPIP-EPP-8.*

EPP-EP-P-08 Rev 15, Attachment 5, Refined Dose Assessment and Protective Actions, Steps 2.3 provides guidance for PARS clearly indicates that values greater than 1 TEDE or greater than 5 CDE are the criteria for the PAR for each EPRA

Justification for "a" being the correct answer:

IAW EPIP-EPP-08, Attachment 1, PARs are re-evaluated to account for the shift in wind direction. At 278°· All of the previously evacuated ERPAs are still affected except 5 and 10 which are still evacuated IAW EPIP-EPP-08 Attachment 5, Section 2.3.4. No further recommendations are needed since the criterion of Table 1.3 in Attachment 1 is not met.

Justification for "c" and "d" being incorrect:
EPIP-EPP-08, Attachment 5, Section 2.3.4 does no allow us to discontinue an evacuation already recommended.

Supporting documentation attached:
EPIP-EPP-08 Revision 15
Section 3.1.1.j
Attachment 1, Tables 1.2 and 1.3
Attachment 5, Section 2.3

FINAL LICENSEE RECOMMENDATION:

On the basis of the above information the facility recommends that question 25 of the SRO exam has Distractor "a" as the correct answer:

A. Continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships. Additional Evacuations are not required.

NRC RESOLUTION:

Background information: The originator of the question (and specified correct answer) assumed that the information in the stem "...radiation levels up to 1 REM TEDE are projected outward to 10.2 miles from the site" would be extrapolated (by the applicants) to conclude that there was > 1 REM at 10 miles. That is, the applicants would assume a point source and calculate that a reading approaching 1 REM at 10.2 miles would result in equal to or greater than 1 REM at 10.0 miles. Procedure EPIP-EPP-08, "Off-site Dose Assessment and Protective Action Recommendations (provided to the applicants during the exam) only address readings > 1 REM/hr based on field survey. There are no instructions in the procedure to take field data at

10.2 miles and extrapolate to the 10.0 mile range. Likewise, Table 1.3 (addressing EPA PAGs) specifies evacuation for TEDE >1 REM. No where in the stem does it specify that there is a TEDE > 1REM.

NUREG 1021, Appendix E, Part B: Written Examination Guidelines, Item #7 specifies that the applicants "do not make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question". As specified in the licensees original response: "Dose projections are not treated solely as a point source- meteorological conditions and downwind surveys or EDAMS projections are used to project dose. The attached printout from the EDAMS computer provides indication that dose rates at a greater distance from the source can be greater than the source when taking into account meteorological conditions". Since there is no data in the stem to support (an assumption) that there is a TEDE > 1 REM then additional evacuations are not required. These facts would provide viable arguments that "B" is not a correct answer (since it requires assumption of a point source and extrapolation of this point source to >1 REM/hr at 10.0 miles)

Step 2.3.4 of EPIP-EPP-08 specifies that "once a PAR is transmitted to the State/County, it shall not be changed". Even though the wind shift specified in the stem of the question changed conditions in areas 5 and 10, the evacuations should proceed as originally directed. This eliminates "C" and "D" distractors as correct answers.

Considering this information, as well as interviews with their own EP personnel, the licensee retracted their original request to accept two correct answers ("A" and "B") and concluded there is only one correct answer; "A" (rather than the original proposed answer "B").

Three examiners reviewed both the original and re-submitted licensee responses and have concluded the second recommended resolution (to accept only "A" as the correct answer) is correct and should be accepted.

Final Resolution:

Change the correct answer for SRO Question #25 from B to A.

P.O. Box 63
Lycoming, NY 13093

Constellation Energy®
Nine Mile Point Nuclear Station

NMP-99404

December 23, 2004

Mr. Samuel J. Collins
Regional Administrator
USNRC Region I
475 Allendale Road
King of Prussia, PA 19406 - 1415

ATTENTION: Mr. John G. Caruso, Senior Examiner/Inspector

SUBJECT: NINE MILE POINT UNIT 1 INITIAL OPERATOR POST WRITTEN EXAMINATION ACTIVITIES

Dear Mr. Collins:

The facility staff administered initial license operator written examinations to nine applicants, as authorized in a letter from the NRC dated November 15, 2004. The initial written examination was administered on November 23, 2004 in accordance with NUREG 1021, Revision 9.

Nine Mile Point Nuclear Station has conducted the post written exam activities as required by NUREG 1021, Revision 9, Draft. Attached is the written examination post-examination comment for re-submittal as discussed with Mr. John G. Caruso, Senior Examiner/Inspector. This will supercede the previously submitted comment.

Please contact Michael Jaquin, Supervisor Initial Operator Training, at (315) 349-1508 for any questions that you may have.

Sincerely,

Terry A. Evans
Manager Nuclear Training

TAE/rer
Enc.

NMP1 License Class LC 1 03-01

NRC INITIAL WRITTEN EXAMINATION POST-EXAMINATION ANALYSIS

This supercedes the NRC INITIAL WRITTEN EXAMINATION POST-EXAMINATION ANALYSIS submitted on 10 December, 2004.

SUMMARY

Per NUREG-1021, Rev 9 Sections ES-402 and ES-501, the facility submits the following NRC INITIAL WRITTEN EXAMINATION POST-EXAMINATION ANALYSIS for your review and consideration.

The facility proposes that question 25 of the SRO examination has Distractor "a" as the correct answer. This change will affect the grades of the SRO applicants.

JUSTIFICATION FOR CHANGE

Problem Statement:
Keyed Answer (b) is incorrect. Distractor "a" is the correct answer

The following statements used to justify "b" as the correct answer are incorrect:
"If dose at 10 miles is projected to meet or exceed 1 rem TEDE or 5 rem CDE (Thyroid), then make protective action recommendations and recommend evacuation to that distance in the affected areas."
The criterion identified in EPIP-EPP-08 R15 clearly defines the threshold value to be ***greater than*** *1 rem TEDE or* ***greater than*** *5 rem CDE. The question stem clearly indicated values less than or equal to 1 rem TEDE. This fact alone means that EPIP-EPP-08 does not require any ERPAs or areas at 10.2 miles distance from the plant to be evacuated. A follow-up interview with a member of the Emergency Planning Organization (John Kaminski), supports the requirements to use field survey data for EPRA recommendations and not assumed or extrapolated dose information.*

"Therefore, continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships for ERPA 1,2,3,4,5,7,9,10 although the new ERPAs based on the windshift are 1,2,3,4,7 and NOT 5 and 9."
The previous PARS implied in the question stem are to evacuate ERPAs 1, 2, 3, 4, 5, 7, 9, 10, 26, & 27 for a wind direction of 304°. With the wind shifting to 278°, the affected ERPAs are 1, 2, 3, 4, 7, 9, 26, & 27. ERPAs 5 and ***10*** *are not affected but will still be included per EPIP-EPP-8.*

EPP-EP-P-08 Rev 15, Attachment 5, Refined Dose Assessment and Protective Actions, Steps 2.3 provides guidance for PARS clearly indicates that values greater than 1 TEDE or greater than 5 CDE are the criteria for the PAR for each EPRA

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 ED/RM 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. Once a PAR is transmitted to the State/County, it shall not be changed.

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).

Justification for "a" being the correct answer:

IAW EPIP-EPP-08, Attachment 1, PARs are re-evaluated to account for the shift in wind direction. At 278°. All of the previously evacuated ERPAs are still affected except 5 and 10 which are still evacuated IAW EPIP-EPP-08 Attachment 5, Section 2.3.4. No further recommendations are needed since the criterion of Table 1.3 in Attachment 1 is not met. As stated above the follow-up interview with a member of the Emergency Planning Organization (John Kaminski), supports the requirement to use field survey data for EPRA recommendations and not assumed or extrapolated dose information

Justification for "c" and "d" being incorrect:
EPIP-EPP-08, Attachment 5, Section 2.3.4 does no allow us to discontinue an evacuation already recommended.

Supporting documentation attached:
EPIP-EPP-08 Revision 15
Section 3.1.1.j
Attachment 1, Tables 1.2 and 1.3
Attachment 5, Section 2.3

RECOMMENDATION:

On the basis of the above information the facility recommends that question 25 of the SRO exam has Distractor "a" as the correct answer:

A. Continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships. Additional Evacuations are not required.

GENERAL SUPERVISOR OPERATIONS U1 _____ 12/22/04
Signature Date

SUPERVISOR OPERATIONS TRAINING: _____ 12/22/04
Signature Date

Constellation Energy®
Nine Mile Point Nuclear Station

P.O. Box 63
Lycoming, New York 13093

NMP-99403

December 10, 2004

Mr. Samuel J. Collins
Regional Administrator
USNRC Region I
475 Allendale Road
King of Prussia, PA 19406 - 1415

ATTENTION: Mr. John G. Caruso, Senior Examiner/Inspector

SUBJECT: NINE MILE POINT UNIT 1 INITIAL OPERATOR POST WRITTEN EXAMINATION ACTIVITIES

Dear Mr. Collins:

The facility staff administered initial license operator written examinations to nine applicants, as authorized in a letter from the NRC dated November 15, 2004. The initial written examination was administered on November 23, 2004 in accordance with NUREG 1021, Revision 9, Draft.

Nine Mile Point Nuclear Station has conducted the post written exam activities as required by NUREG 1021, Revision 9, Draft. The following documentation is being submitted to the NRC Senior Examiner:

- Original graded scantron answer sheets and attached cover sheets.
- Clean copies of scantron answer sheets.
- Master (as given) RO and SRO exam questions and answer keys with annotated changes during exam administration and grading.
- Checklists of applicants questions/comments during NRC initial written examination.
- Checklist for NRC initial written examination post-examination comments.
- Results of examination and item analysis.
- Written exam seating chart.
- Signed and completed written exam grading quality checklist Form ES-403-1 for Reactor Operator and Senior Reactor examinations.

The post exam security agreement will be submitted as soon as possible. Call Gregg Pitts, General Supervisor Operations Training, at 315-349-1864 if you have any questions.

Sincerely,

Terry A. Evans
Manager Nuclear Training

TAE/crr
Enc.

NMP1 License Class LC1 03-01

NRC INITIAL WRITTEN EXAMINATION POST-EXAMINATION ANALYSIS

SUMMARY

Per NUREG-1021, Rev 9 Sections ES-402 and ES-501, the facility submits the following NRC INITIAL WRITTEN EXAMINATION POST-EXAMINATION ANALYSIS for your review and consideration.

The facility proposes that question 25 of the SRO examination has 2 correct answers. This is a result from the lack of stem focus. This change will affect the grade of one applicant.

25 **SYSID: 21206** **Points: 1.00**

Emergency events are in progress:

- (08:00) General emergency declared.
- (08:12) Notification sent with wind direction from 304°.
- (08:42) EOF is manned including county and state representatives.
- (08:52) Radiological Assessment Manager reports radiation levels up to 1 REM TEDE are projected outward to 10.2 miles from the site.
- (08:52) Wind direction HAS SHIFTED and is now from 278°.

Which one of the following is the correct information to be communicated to the EOF regarding protective action recommendations?

A. Continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships. Additional Evacuations are not required.

B. Continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships. Additional evacuations are being recommended for MEXICO and RICHLAND townships.

C. Some evacuations in SCRIBA Township will be discontinued. Continue the previously recommended evacuations in NEW HAVEN Township. Additional Evacuations are not required.

D. Some evacuations in SCRIBA Township will be discontinued. Continue the previously recommended evacuations in NEW HAVEN Township. Additional evacuations are being recommended for MEXICO and RICHLAND townships.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 25 Details

Question Type:	Multiple Choice
Topic:	NRC SRO REPLACEMENT #25
System ID:	21206
User ID:	
Status:	Active
Must Appear:	No
Difficulty:	0.00
Time to Complete:	0
Point Value:	1.00
Cross Reference:	LC1 03-01
User Text:	
User Number 1:	0.00
User Number 2:	0.00
Comment:	EPIP-EPP-08, Attachment 1, Table 1.2 EPIP-EPP-08, Attachment 5, 2.3.4, 2.3.5

Answer:	b. If dose at 10 miles is projected to meet or exceed 1 rem TEDE or 5 rem CDE (Thyroid), then make protective action recommendations and recommend evacuation to that distance in the affected areas. Also, PARs made previously must be accounted for when revised. For example, if a PAR to evacuate an ERPA was previously made and that PAR does not appear on a revised map (ERPAs change) that PAR must sill be included in the revised recommendations to the State/County. Once a PAR is transmitted to State/Count, it shall not be changed. Therefore, continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships for ERPA 1,2,3,4,5,7,9,10 although the new ERPAs based on the windshift are 1,2,3,4,7 and NOT 5 and 9. Additional evacuations are to be recommended out to 10 miles which includes areas in NEW HAVEN, MEXICO, and RICHLAND townships. If projected doses exceed 1 REM TEDE for distances greater than 10 miles, PARs shall be made using convenient geographical boundaries (such as townships).
Distractor:	a. Additional evacuations are to be recommended for affected areas out to 10 miles.
Distractor:	c. PARs made previously must be accounted for when revised. For example, if a PAR to evacuate an ERPA was previously made and that PAR does not appear on a revised map (ERPAs change) that PAR must sill be included in the revised recommendations to the State/County. Once a PAR is transmitted to State/Count, it shall not be changed. Additional evacuations are to be recommended for affected areas out to 10 miles.
Distractor:	d. Additional evacuations are to be recommended for affected areas out to 10 miles.

References Provided: EPIP-EPP-08 (entire procedure), Ten Mile Emergency Planning Zone (COLOR) map with ERPAs and Townshiplines.

Question 25 Cross References (table item links)

10CFR55

- 43(b)(4)

Cognitive Level

- 3

NUREG 1123 KA Catalog Rev. 2

- G2.4.44 2.1/4 Knowledge of emergency plan protective action recommendations
- 295038 High Offsite Release Rate

Question Source

- New

PROC

- EPIP-EPP-08 Rev. NA

JUSTIFICATION FOR CHANGE

The flaw stems from the ambiguity in the ~~3rd~~ 4th bullet that states:

"(08:52) Radiological Assessment Manager reports radiation levels up to 1 REM TEDE are projected outward to 10.2 miles from the site." More specifically – *"...up to 1 REM TEDE projected outward to 10.2 miles..."*

The author of the question assumed that the applicants look at the calculation as a linear function and assumed that the applicants would determine that 1 REM TEDE would be exceeded. A faulty mental model during question development and review failed to take into account any meteorological conditions.

In accordance with EPIP-EPP-08 the criteria used to determine PAR for each ERPA is Evacuate when TEDE is >1 (greater than). This can be found in several sections including: Step 3.1.1. j. 3., Attachment 1 Flow chart (not provided during exam) and Table 1.3, Attachment 5 step 2.3.4

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

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

1. Advise the SSS/ED 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 practical. 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.

TABLE 1.3 - EPA 400 Protective Action Guidelines (EPA PAGs)		
PAR)	**TEDE (rem**	**) CDE_T (rem**
Evacuate	> 1	> 5

Attachment 5

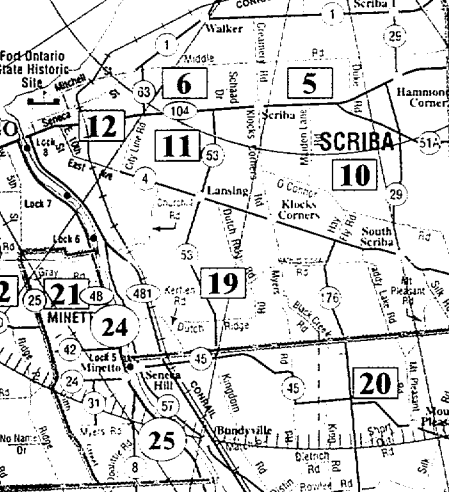
2.3.4 PARs that have been made previously must be accounted for when PARs are revised. For example, if a PAR to evacuate an ERPA was previously made to the State/County and that PAR does not appear on a revised map from 1.2.9.j, that PAR must still be included on the revised recommendation to the State/County.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

To select between answer A and B, evaluation of the following data is required:

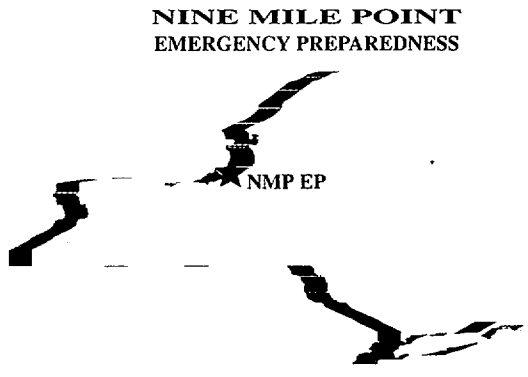
"radiation levels are **up to** 1 REM" ... "**outward to** 10.2 miles".

There are multiple assumptions that can be made based on the given conditions. Since evacuation of any ERPA or areas beyond 10 miles is based on the dose projection for that specific area and no areas are stated as being greater than 1 REM then it cannot assumed there is an area or multiple areas above 1 REM closer to the plant OR farther from the plant. Dose closer to the plant or beyond 10 miles could be in

Ten Mile Emergency Planning Zone (Plume Exposure Pathway)



Nine Mile Point / James A. Fitzpatrick Radiological Emergency Plans and Procedures



NINE MILE POINT NUCLEAR STATION

EMERGENCY PLAN IMPLEMENTING PROCEDURE

EPIP-EPP-08

REVISION 15

OFF-SITE DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATION

TECHNICAL SPECIFICATION REQUIRED

Approved by:
G. L. Detter Manager Security and Emergency Preparedness Date

Effective Date: _____

PERIODIC REVIEW DUE DATE: _____

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/Emergency Director (SSS/ED)**:

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 **Emergency Director/Recovery Manager (ED/RM)** 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 TSC Manager 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. Review and complete (as appropriate) EPIP-EPP-23 Attachment 8.

3.1.1 (Cont)

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

c. Access EDAMS computer using Attachment 2.

d. Obtain meteorological data using Attachment 3 (each 15 minutes).

e. Assess effluent monitor readings and conditions.

f. Determine release rates using Attachment 4.

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.

g. Compare the release rate to the Table 1.1 values.

h. Use Attachment 1 flowchart and advise SSS/ED of any PARs recommended by the flowchart.

NOTE: A release (tube leak) from the Emergency Condenser (EC) Vent is considered an unmonitored atmospheric release. An out of plant survey is needed to determine actual Release Rate.

i. Compare monitor readings and calculated release rates to ODCM limits using Attachment 4A.

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

1. Advise the SSS/ED 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 practical. 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.

3.1.1 (Cont)

k. Assist the SSS/ED in completing the Part 1 Notification Fact Sheet.

l. Continue to monitor meteorological data, changes in effluent conditions or conditions that might lead to abnormal radiological effluents (or changes to PARs).

m. When contacted by EOF Dose Assessment Staff, provide briefing on:

- Status of any radiological releases
- Dose assessments efforts to date
- Impending or actual PARs

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 or monitor readings 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 Meteorologist availability.

3.2.1 (Cont)

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.

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

NOTE: A release (tube leak) from the Emergency Condenser (EC) Vent is considered an unmonitored atmospheric release. An out of plant survey is needed to determine actual Release Rate.

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 ED/RM 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 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

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, 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 **Standards, Regulations, and Codes**

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

5.4 **Policies, Programs, and Procedures**

5.4.1 EPIP-EPP-07, Downwind Radiological Monitoring

5.4.2 EPIP-EPP-15, Emergency Health Physics Procedure

5.4.3 EPIP-EPP-23, Emergency Personnel Action Procedures

5.4.4 N2-CSP-LWS-M203, Monthly Liquid Release Dose Calculation

5.4.5 N1-CSP-M204, Liquid Release Dose Calculation

5.4.6 "Implementation of the use of KI as a protective action for the public", New York State EP Subcommittee Technical Issues Task Force, March 2003

5.5 **Commitments**

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
- Attachment 5.1, Chronological Release Rate Log
- Attachment 5.2, EDAMS/RadDose 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.

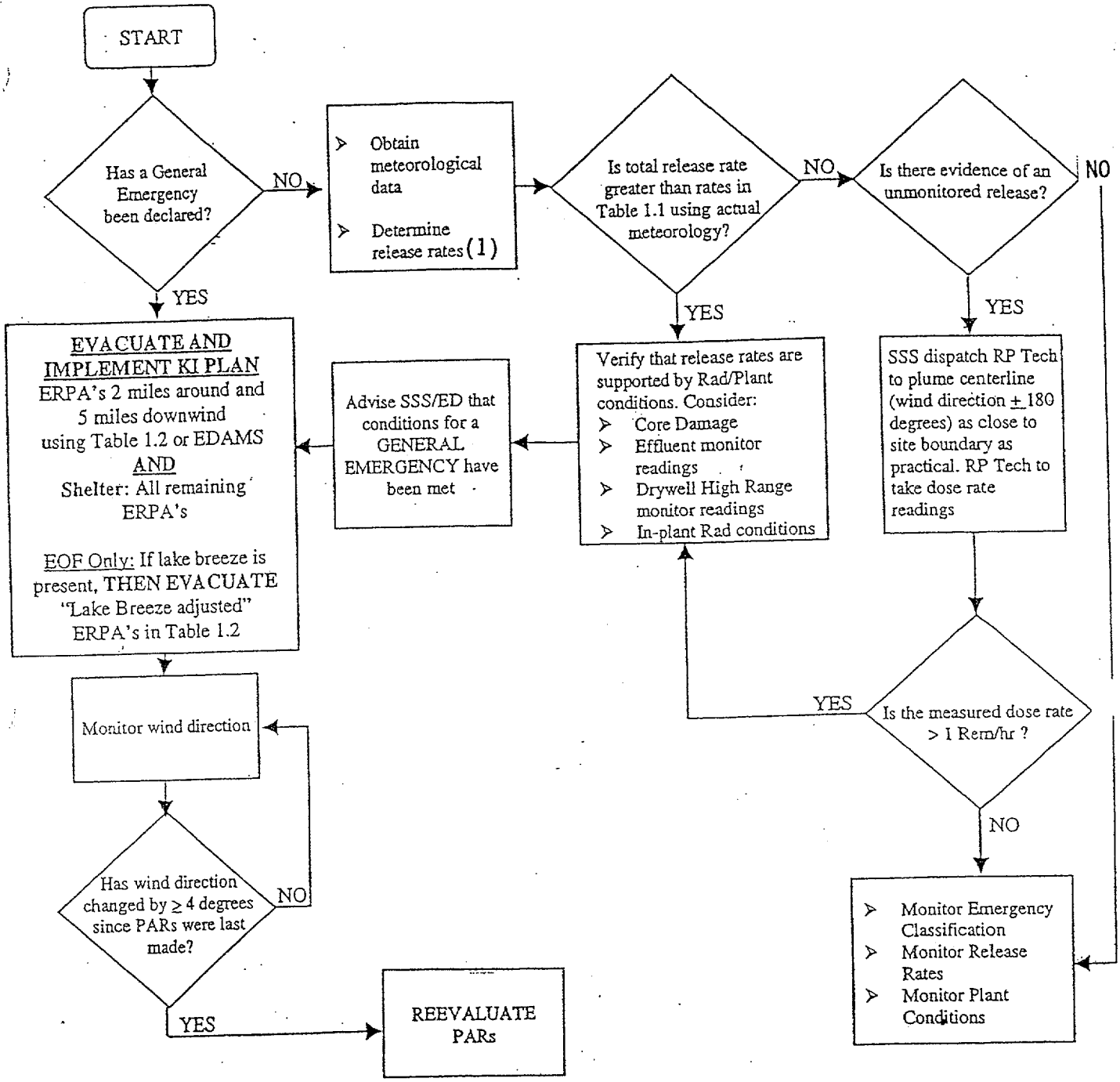
- Attachment 1, Initial Dose Assessment and Protective Actions
- Attachment 4, Release Rate Determination
- Attachment 5.1, Chronological Release Rate Log
- Attachment 5.2, EDAMS/RadDose Data Entry Form

This page as provided during exam. (See Next Page for missing figure)

(1) Use this formula if release has a ground AND elevated source:

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

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



(1) Use this formula if release has a ground AND elevated source:

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

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

* this criteria for GE and Initial PARs *

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 Miles Around and 5 Miles Downwind		Lake Breeze Adjusted (5 Mile Radius)
214 to 222	1, 2, 3, 26, 27		
223 to 233	1, 2, 3, 26, 27		4, 7
234 to 240	1, 2, 3, 7, 26, 27		4
241 to 254	1, 2, 3, 4, 7, 26, 27		9
255 to 262	1, 2, 3, 4, 7, 26, 27		9
263 to 278	1, 2, 3, 4, 7, 9, 26, 27		5
279 to 292	1, 2, 3, 4, 5, 7, 9, 26, 27		10
293 to 305	1, 2, 3, 4, 5, 7, 9, 10, 26, 27		
306 to 311	1, 2, 3, 4, 5, 7, 9, 10, 26, 27		
312 to 332	1, 2, 3, 4, 5, 7, 9, 10, 26, 27		6, 11
333 to 340	1, 2, 3, 4, 5, 9, 10, 11, 26, 27		6, 7, 12
341 to 349	1, 2, 3, 4, 5, 9, 10, 11, 26, 27		6, 7, 12
350 to 356	1, 2, 3, 5, 6, 9, 10, 11, 26, 27		4, 7
357 to 0 0 to 12	1, 2, 3, 5, 6, 9, 10, 11, 26, 27		4
13 to 20	1, 2, 3, 5, 6, 10, 11, 26, 27		4, 9
21 to 51	1, 2, 3, 5, 6, 10, 11, 26, 27		9
52 to 56	1, 2, 3, 5, 6, 11, 26, 27		10
57 to 61	1, 2, 3, 5, 6, 11, 26, 27		10
62 to 70	1, 2, 3, 6, 11, 26, 27		10
71 to 89	1, 2, 3, 6, 26, 27		11
90 to 95	1, 2, 3, 6, 26, 27		5, 11, 12
96 to 114	1, 2, 3, 26, 27		6, 12
115 to 146	1, 2, 3, 26, 27		
147 to 213	1, 2, 3, 26, 27		

EOF Only beyond this line!

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

PAR	TEDE (rem)	CDE_T (rem)
Evacuate	> 1	> 5

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/RadDose Data Entry Form", Attachment 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 the accident type that most closely matches the source term going to the environment. Use the table below as a guide.

Fuel Damage/Reduction Mechanism	Accident Type
None/none	LOCA
Minor (gap release)/SBGT or GTS	LOCA
Significant (grain boundary - melt)/none	DBA
Significant (grain boundary -melt)/SBGT or GTS	LOCA
Severe (melt)/SBGT or GTS	Severe Accident
Severe (melt)/none	Severe Accident

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.

1.2.7 (Cont)

c. Select the "Method" used to determine the release rate by selecting the highlighted cell or by hitting the "F2" key and selecting.

1. Utilize Attachment 4 Section 2.0 for Unit 1 releases.

2. Utilize Attachment 4 Section 3.0 for Unit 2 releases.

a. Enter correct Calibration Factor, if appropriate, then select "OK".

b. Enter appropriate Flow Rate and monitor reading.

d. Select the Iodine release rate "Method" by selecting the highlighted cell or by hitting "F2" key. Utilize one of the following:

1. Grab Sample: This section can be used if concentrations (µCi/cc) by isotope, and associate flow rate are available

a. obtain sample analysis results from TSC

b. enter concentration of each isotope

c. enter flow rate (cfm) associated with sample

NOTE: This method will override previously input Total Release Rate method

2. Direct: This selection utilizes direct entry of the release rate (in Ci/Sec) obtained by any method, including the following

a) Use of downwind survey team data

1) determine the representative I/NG ratio using field data and the methodology described in EPIP-EPP-07.

2) multiply the NG or total release rate (obtained from Attachment 4) by the I/NG ratio.

3) enter the Iodine release rate in the appropriate column.

1.2.7 (Cont)

3. Ratio: This selection utilizes the UFSAR/USAR I/NG ratio and multiplies it by the Total Release Rate.

Accident Type	I/NG Ratio	
	U1	U2
LOCA	5.59 E-4	2.23 E-4
DBA	8.2 E-4	1.97 E-2
Steam Line Break	7.64	33.5

4. UFSAR:

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 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.

1.2.8 (Cont)

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.

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 both 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. Select "Yes" if a GE has been declared for any reason, OR "No" if GE has not been declared.

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

j. Select "Go to Report Menu".

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

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

m. Select "Print Notification Form Part 2", as directed by the ODAM, to print Part II Notification Fact Sheet.

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

1.2.9 (Cont)

0. 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

p. If the next 15 minute internal is part of the forecast for ERPAs/towns/etc., where the plume has not yet arrived at those locations, add data to the next projection.

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 the 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.

2.3 If evacuation is recommended for an ERPA, Then the recommendation shall include implementation of the KI Plan.

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

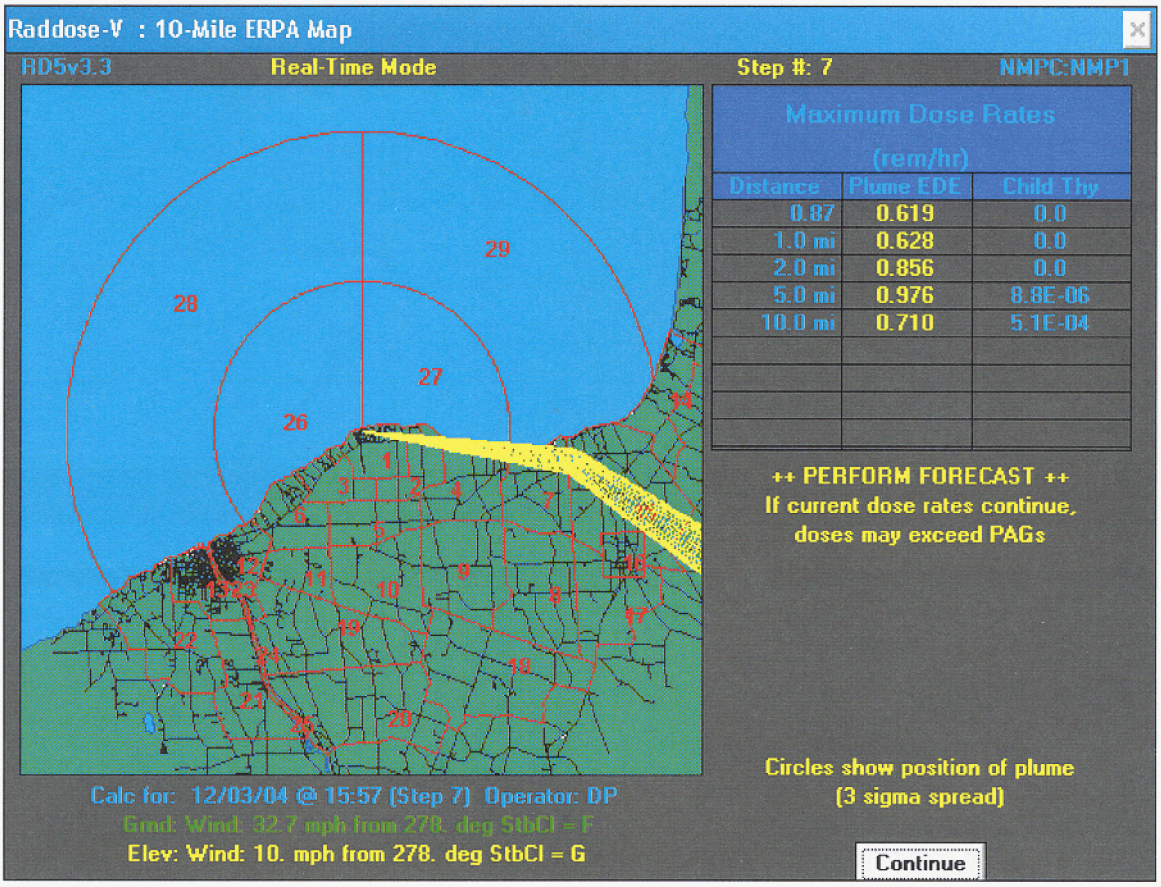
2.3.3 Record the PAR for each ERPA on the Part 1 Notification Form and give to the ED/RM for approval.

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. Once a PAR is transmitted to the State/County, it shall not be changed.

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).

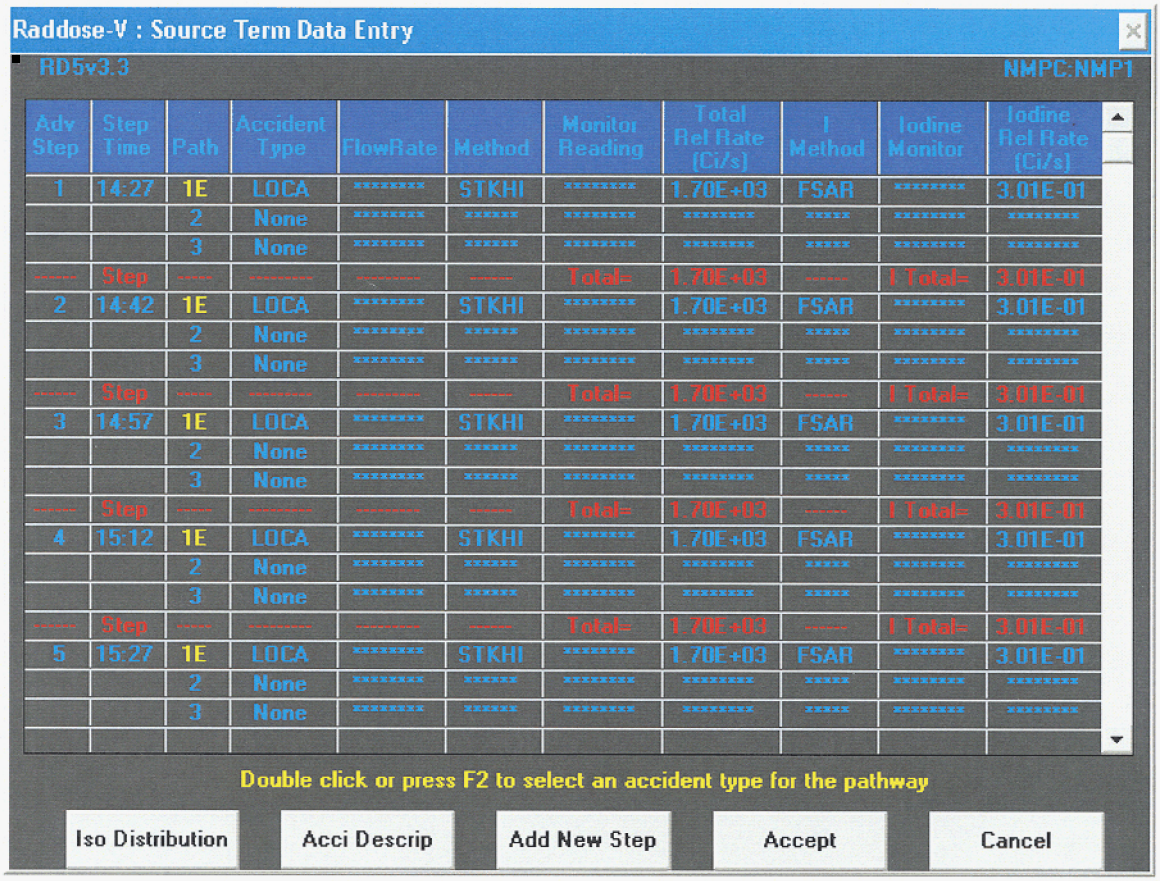
TABLE 5.1 - FSAR/USAR ACCIDENT TYPE

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

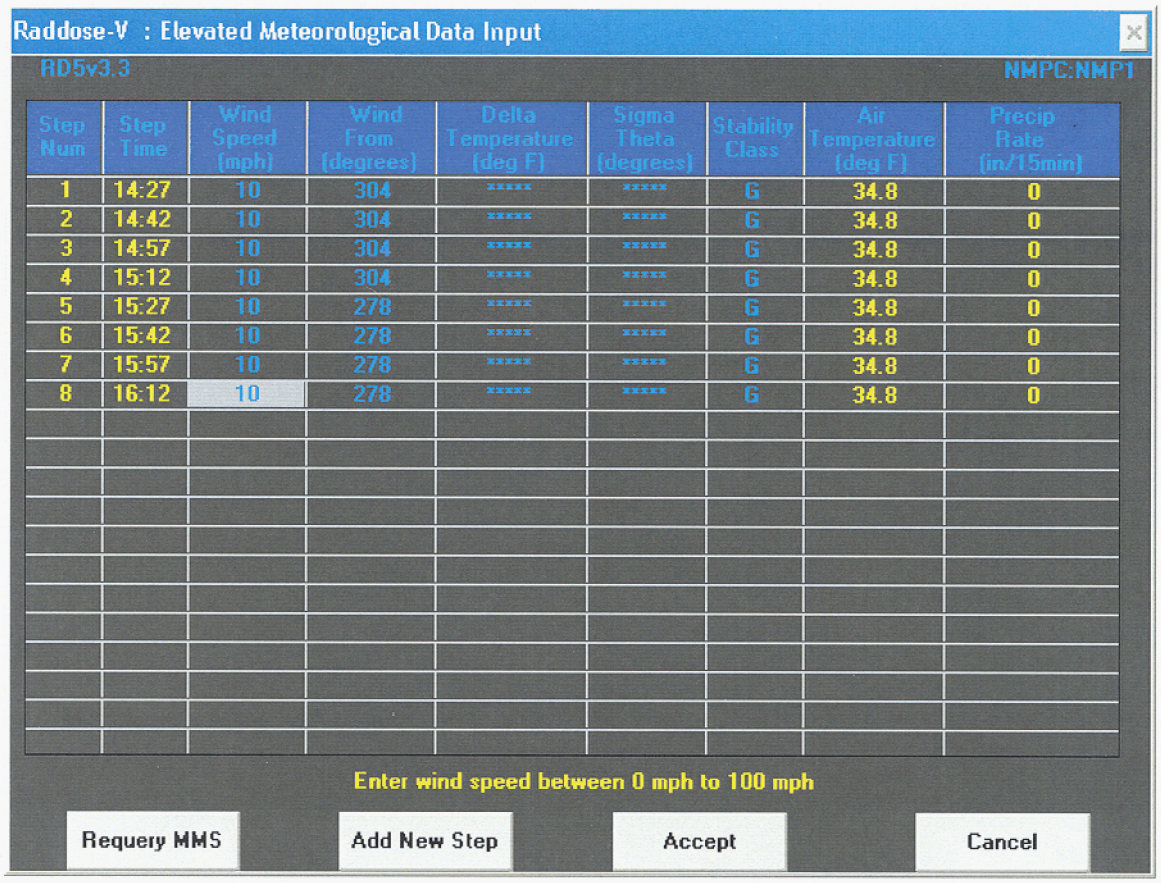


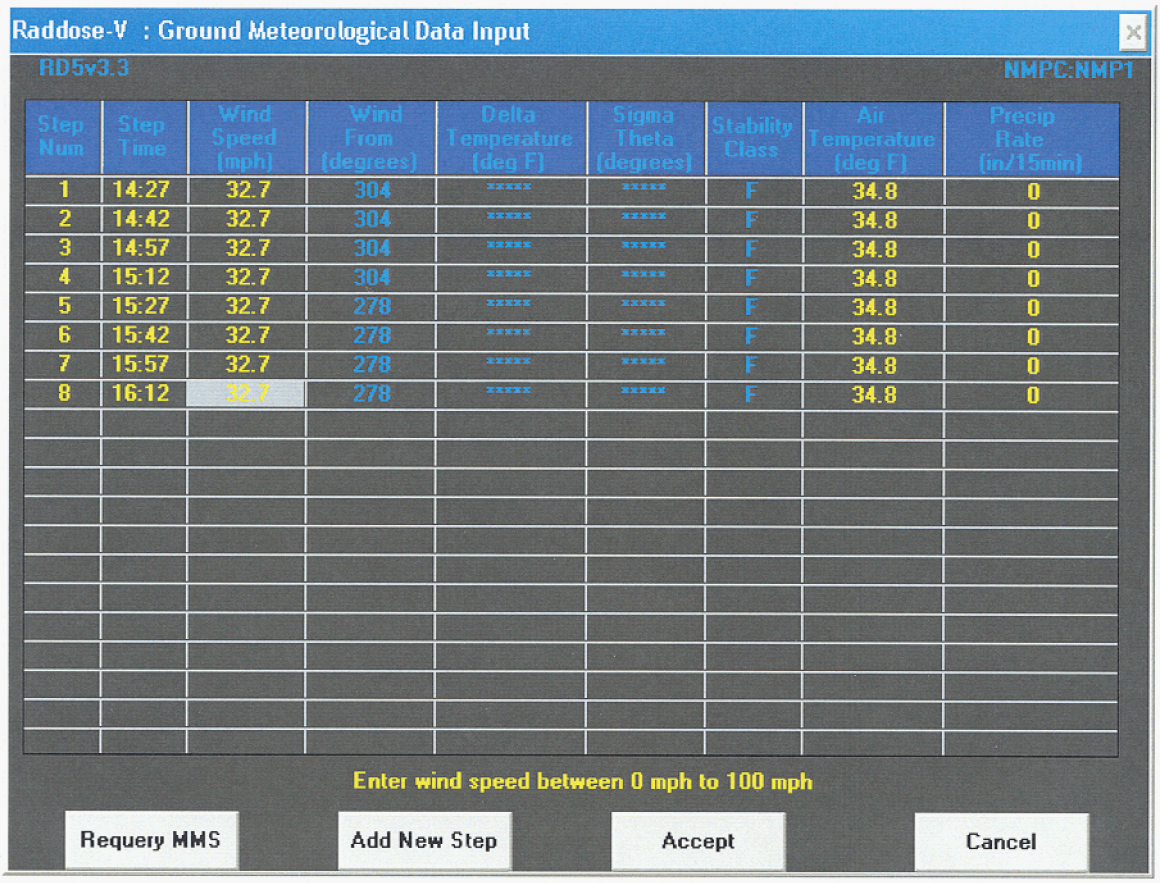
This Dose calculation and following pages shows outward to 10 miles with up to 1 REM (.976) with the greatest Dose at 5 miles from the site and all Dose projections below 1 REM. Note that the wind direction change was included in this case approximately 1 hour into the event.

This dose calculation was made by RADDOSE software described in EPIP-EPP-08 (see Attachment 5) and maintained in accordance with EPMP-EPP-03 (see step 3.1.4). These doses are based no a LOCA with manually input release data and meteorological data.


Raddose-V : Source Term Data Entry
RD5v3.3
NMPC:NMP1
Adv Step
Step Time
Path
Accident Type
FlowRate
Method
Monitor Reading
Total Rel Rate (Ci/s)
I Method
Iodine Monitor
Iodine Rel Rate (Ci/s)
1 14:27 1E LOCA ******** STKHI ******** 1.70E+03 FSAR ******** 3.01E-01
2 None ******** ****** ******** ******** ***** ******** ********
3 None ******** ****** ******** ******** ***** ******** ********
----- Step ----- ---------- ---------- ------ Total= 1.70E+03 ----- I Total= 3.01E-01
2 14:42 1E LOCA ******** STKHI ******** 1.70E+03 FSAR ******** 3.01E-01
2 None ******** ****** ******** ******** ***** ******** ********
3 None ******** ****** ******** ******** ***** ******** ********
----- Step ----- ---------- ---------- ------ Total= 1.70E+03 ----- I Total= 3.01E-01
3 14:57 1E LOCA ******** STKHI ******** 1.70E+03 FSAR ******** 3.01E-01
2 None ******** ****** ******** ******** ***** ******** ********
3 None ******** ****** ******** ******** ***** ******** ********
----- Step ----- ---------- ---------- ------ Total= 1.70E+03 ----- I Total= 3.01E-01
4 15:12 1E LOCA ******** STKHI ******** 1.70E+03 FSAR ******** 3.01E-01
2 None ******** ****** ******** ******** ***** ******** ********
3 None ******** ****** ******** ******** ***** ******** ********
----- Step ----- ---------- ---------- ------ Total= 1.70E+03 ----- I Total= 3.01E-01
5 15:27 1E LOCA ******** STKHI ******** 1.70E+03 FSAR ******** 3.01E-01
2 None ******** ****** ******** ******** ***** ******** ********
3 None ******** ****** ******** ******** ***** ******** ********
Double click or press F2 to select an accident type for the pathway
Iso Distribution
Acci Descrip
Add New Step
Accept
Cancel


Raddose-V : Source Term Data Entry
RD5v3.3
NMPC:NMP1
Adv Step
Step Time
Path
Accident Type
FlowRate
Method
Monitor Reading
Total Rel Rate (Ci/s)
I Method
Iodine Monitor
Iodine Rel Rate (Ci/s)
2 None
3 None
Step
Total=
1.70E+03
I Total=
3.01E-01
4 15:12 1E LOCA STKHI FSAR
5 15:27 1E LOCA STKHI FSAR
6 15:42 1E LOCA STKHI FSAR
7 15:57 1E LOCA STKHI
1.80E+03
Double click or press F2 to select an accident type for the pathway
Iso Distribution
Acci Descrip
Add New Step
Accept
Cancel


Raddose-V : Elevated Meteorological Data Input
RD5v3.3
NMPC:NMP1
Step Num
Step Time
Wind Speed (mph)
Wind From (degrees)
Delta Temperature (deg F)
Sigma Theta (degrees)
Stability Class
Air Temperature (deg F)
Precip Rate (in/15min)
1 14:27 10 304 ***** ***** G 34.8 0
2 14:42 10 304 ***** ***** G 34.8 0
3 14:57 10 304 ***** ***** G 34.8 0
4 15:12 10 304 ***** ***** G 34.8 0
5 15:27 10 278 ***** ***** G 34.8 0
6 15:42 10 278 ***** ***** G 34.8 0
7 15:57 10 278 ***** ***** G 34.8 0
8 16:12 10 278 ***** ***** G 34.8 0
Enter wind speed between 0 mph to 100 mph
Requery MMS
Add New Step
Accept
Cancel


Raddose-V : Ground Meteorological Data Input
RD5v3.3
NMPC:NMP1
Step Num
Step Time
Wind Speed (mph)
Wind From (degrees)
Delta Temperature (deg F)
Sigma Theta (degrees)
Stability Class
Air Temperature (deg F)
Precip Rate (in/15min)
1 14:27 32.7 304 ***** ***** F 34.8 0
2 14:42 32.7 304 ***** ***** F 34.8 0
3 14:57 32.7 304 ***** ***** F 34.8 0
4 15:12 32.7 304 ***** ***** F 34.8 0
5 15:27 32.7 278 ***** ***** F 34.8 0
6 15:42 32.7 278 ***** ***** F 34.8 0
7 15:57 32.7 278 ***** ***** F 34.8 0
8 16:12 32.7 278 ***** ***** F 34.8 0
Enter wind speed between 0 mph to 100 mph
Requery MMS
Add New Step
Accept
Cancel