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# PP&L EMERGENCY PERSONNEL DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATION (PAR) GUIDE

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**EMERGENCY EXPOSURE EXTENSION REQUEST FORM** and  
**POTASSIUM IODIDE TRACKING FORM** can be found immediately following  
EP-AD-000-125.

**PP&L EMERGENCY PERSONNEL DOSE ASSESSMENT AND  
PROTECTIVE ACTION RECOMMENDATION (PAR) GUIDE  
(continued)**

**CHECK**

1.0 Limits for **EMERGENCY** doses.

- 1.1 An **EMERGENCY DOSE AUTHORIZATION** (see EMERGENCY EXPOSURE EXTENSIONS) may be granted in order to protect facilities, and or equipment to substantially limit the escape of radioactive effluents or control fires. The maximum planned doses are:

1.1.1 Whole body (TEDE)<sup>(1)</sup> dose shall not exceed 10 Rem.

1.1.2 Dose to any organ (CDE)<sup>(2)</sup>, including the skin and extremity (SDE)<sup>(3)</sup>, shall not exceed 100 Rem.

1.1.3 Dose to the lens of the eye shall not exceed 30 Rem (LDE)<sup>(4)</sup>.

- 1.2 An **EMERGENCY** dose authorization may be granted for life-saving actions or protection of large populations. The maximum doses are:

1.2.1 Planned whole body (TEDE)<sup>(1)</sup> doses shall not exceed 25 Rem.

1.2.2 Planned dose to any organ (CDE)<sup>(2)</sup>, including skin and extremity doses, shall not exceed 250 Rem.

1.2.3 Dose to the lens of the eye shall not exceed 75 Rem (LDE)<sup>(4)</sup>.

- 1.3 **RARE** situations may occur in which a dose **GREATER THAN** those specified in SECTION 1.2 above for emergency dose would be unavoidable to carry out a lifesaving operation or to avoid extensive exposure of large populations. It is not possible to prejudge the risk that one should be allowed to take to save lives of others, therefore no upper limit has been established.

- (1) The sum of the Effective Dose Equivalent resulting from the exposure to external sources and the committed effective Dose Equivalent incurred from all significant inhalation pathways during the early phase.  
(2) The Committed Dose Equivalent to the thyroid from radioiodine.  
(3) Shallow Dose Equivalent.  
(4) Lens Dose Equivalent.

**PP&L EMERGENCY PERSONNEL DOSE ASSESSMENT AND  
PROTECTIVE ACTION RECOMMENDATION (PAR) GUIDE  
(continued)**

**CHECK**

2.0 For any **EMERGENCY EXPOSURE OR ACCIDENTAL OVEREXPOSURE**, the assessment actions in step 2 of the EMERGENCY EXPOSURE EXTENSIONS must be performed.

**3.0 PROTECTIVE ACTIONS**

3.1 Potassium Iodide

3.1.1 For emergency workers entering areas where a committed dose equivalent, (CDE)<sup>(2)</sup>, to the thyroid from radioiodine could be 25 Rem or greater, the **Consulting Radiological Physician** should provide input concerning the administration and cessation of KI intake. (See Emergency Telephone Directory for telephone number.)

3.1.2 For thyroid exposures that are strongly expected to exceed 25 Rem, (CDE)<sup>(2)</sup>, KI doses of 130 mg (100 mg - iodine) per day should be administered.

Unless the **EMERGENCY DIRECTOR** or **RECOVERY MANAGER** instructs personnel to do otherwise, the KI tablets should generally be taken **as soon as possible** after thyroid exposure exceeding 25 Rem (CDE)<sup>(2)</sup> is projected.

**NOTE: Stable Iodine (KI) is most effective when administered immediately prior to exposure to radioiodine. Significant blockage of the thyroid dose can be provided by administration within one or two hours after uptake of radioiodine.**

- (1) The sum of the Effective Dose Equivalent resulting from the exposure to external sources and the committed effective Dose Equivalent incurred from all significant inhalation pathways during the early phase.
- (2) The Committed Dose Equivalent to the thyroid from radioiodine.
- (3) Shallow Dose Equivalent.
- (4) Lens Dose Equivalent.

**PP&L EMERGENCY PERSONNEL DOSE ASSESSMENT AND  
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(continued)**

**CHECK**

3.1.3 Onsite issuance of KI for iodine prophylaxis requires the approval of the **EMERGENCY DIRECTOR**. Issuance to EOF and FIELD EMERGENCY MONITORING/SAMPLING TEAM personnel requires the approval of the **RECOVERY MANAGER** when the EOF has relieved the TSC of emergency management activities. The **EMERGENCY DIRECTOR** will approve issuance prior to that time. These approvals must be documented on the **POTASSIUM IODIDE (KI) TRACKING FORM**.

3.1.4 For an injured and/or contaminated worker sent to a hospital for treatment, the patient will be under the care of the attending physician. As such, plant procedures no longer apply and KI issuance will be at the discretion of the attending physician. The physician can rely on a senior Health Physics Technician Level II or Health Physics Management to provide the in-plant radiological data on which to base their decision.

3.2 Protective measures should be implemented for EOF personnel at the direction of the **DOSE ASSESSMENT SUPERVISOR**.

3.3. Exposures to members of local offsite support groups, (ambulance workers, fire fighters) shall not exceed 500 mrem (TEDE)<sup>(1)</sup> for the performance of support duties on the site of the Susquehanna SES.

4.0 **EMERGENCY EXPOSURE NOTIFICATIONS AND A HEALTH CONSEQUENCE INVESTIGATION** must be conducted for any emergency exposure as outlined in step 6 of the Emergency Exposure Extensions.

- (1) The sum of the Effective Dose Equivalent resulting from the exposure to external sources and the committed effective Dose Equivalent incurred from all significant inhalation pathways during the early phase.
- (2) The Committed Dose Equivalent to the thyroid from radioiodine.
- (3) Shallow Dose Equivalent.
- (4) Lens Dose Equivalent.

## EMERGENCY EXPOSURE EXTENSIONS

### CHECK

1. Fill out the attached EMERGENCY EXPOSURE EXTENSION REQUEST Form.
2. Review the following factors:
  - Rescue personnel should be volunteers or professional rescuers.
  - Other considerations being equal (e.g., skill, potential need for person on another mission) personnel above the age of 45 are preferred.
  - Rescue personnel should be familiar and briefed with the consequences of exposure.
  - Women capable of reproduction should not take part in an effort requiring EMERGENCY exposure.
  - Use of personnel with high lifetime cumulative exposure should be discouraged.
  - All reasonable measures must be taken to control contamination and internal exposure.
  - Exposure under these conditions shall be limited to once in a lifetime.
  - For exposures greater than 25 Rem whole body (TEDE), the persons undertaking any emergency operation in which the dose will exceed 25 Rem to the whole body (TEDE) should do so only on a voluntary basis and with full awareness of the risks involved, including the numerical levels of dose at which acute effects of radiation will be incurred and numerical estimates of the risk of delayed effects. See the following two tables for general information concerning Health Effects & Cancer Risks.

## EMERGENCY EXPOSURE EXTENSIONS (continued)

CHECK

Health Effects Associated with Whole Body Absorbed Doses Received Within a Few Hours<sup>(a)</sup>

Whole Body Absorbed Dose (rad)	Early Fatalities <sup>b</sup> (percent)	Whole Body Absorbed Dose (rad)	Prodromal Effects <sup>c</sup> (percent affected)
140	5	50	2
200	15	100	15
300	50	150	50
400	85	200	85
460	95	250	98

- a Risks will be lower for protracted exposure periods.
- b Supportive medical treatment may increase the dose at which these frequencies occur by approximately 50 percent.
- c Symptoms (nausea, vomiting) which occur within a few hours after exposure to large doses of radiation and which usually precede more serious health effects.

Approximate Cancer Risk to Average Individuals from 25 Rem Effective Dose Equivalent Delivered Promptly

Age at Exposure (years)	Approximate Risk of Premature Death (deaths per 1,000 persons exposed)	Average Years of Life Lost if Premature Death Occurs (years)
20 to 30	9.1	24
30 to 40	7.2	19
40 to 50	5.3	15
50 to 60	3.5	11

3. Review the HEALTH PHYSICS AND ALARA CONSIDERATIONS DURING EMERGENCIES which is attached.
4. Obtain appropriate approval signatures as outlined in the table below.

EXTENSION		APPROVAL	ACTIONS
FROM mrem (TEDE)	TO mrem (TEDE)		
4000	<25000	ED and RPC/RM and DASU	ALARA REVIEW AND APPLY EMERGENCY EXPOSURE CONSIDERATIONS
>25000		ED and RPC/RM and DASU	ALL OF ABOVE AND BRIEFING ON RISKS

## EMERGENCY EXPOSURE EXTENSIONS (continued)

### CHECK

5. If the Emergency Dose Extension is for greater than 4 Rem (TEDE), have the volunteer sign the EMERGENCY EXPOSURE REQUEST Form acknowledging that they are a volunteer and are fully aware of the radiological risks of acute and delayed effects.
6. Upon completion of the activity requiring the Emergency Exposure perform the following:
  - Collect, process, and evaluate personnel dosimetry devices when technically appropriate.
  - Investigate the circumstances of all emergency exposures and confirm the dose received.
  - Notify the NRC of emergency exposure as follows:

**Immediate notification** of the NRC is required for:

- a. Exposure of the whole body of greater than 25 Rem (TEDE); or
- b. Exposure of the skin of the whole body of greater than 150 Rem (SDE); or
- c. Exposure of the extremities of greater than 375 Rem (SDE).

Notification of the NRC **within 24 hours** is required for:

- a. Exposure of the whole body of greater than 5 Rem (TEDE); or
  - b. Exposure of the skin of the whole body of greater than 30 Rem (SDE); or
  - c. Exposure of the extremities of greater than 75 Rem (SDE).
- Assess the health consequences of all emergency exposures. Consult with a physician to determine the need for and extent of physical and biochemical examinations.
  - Whole body greater than 25 Rem (TEDE) should result in an examination of the exposed person by a physician.
  - If internal exposure is suspected, quantitative measurements should be made immediately. Bioassays are required based on the following:
    - Nasal smear or facial contamination greater than 1,000 cpm above background.
    - Greater than 4 DAC-HRS in a day or less, or 20 DAC-HRS in a week or less.

## HEALTH PHYSICS AND ALARA CONSIDERATIONS DURING EMERGENCIES

### CHECK

1.0 Evaluate radiological conditions.

1.1 Obtain detailed survey data to ascertain:

1.1.1 Beta-Gamma radiation levels

1.1.2 Need for neutron measurements

1.1.3 Contamination levels and protective clothing requirements

1.1.4 Airborne radioactive materials

1.1.5 Variability of conditions over space and time

1.2 Evaluate personnel status.

1.2.1 Determine available dose under normal administrative dose objectives.

1.2.2 If essential, obtain approval from RADIATION PROTECTION COORDINATOR/EMERGENCY DIRECTOR for persons expected to exceed administrative objectives.

1.2.3 Follow criteria in PP&L Emergency Personnel Dose Assessment and Protective Action Recommendation Guide when emergency exposures are deemed appropriate by EMERGENCY DIRECTOR.

1.2.4 Assess individual's history of exposure to airborne materials.

1.2.5 Assess individual's skills in relation to proposed task.

1.2.6 Assess individual's lifetime exposure history.

## HEALTH PHYSICS AND ALARA CONSIDERATIONS DURING EMERGENCIES (continued)

### CHECK

- 1.3 Determine proper type and placement of dosimeters.

- 1.3.1 Evaluate need for additional whole body dosimeters.

**NOTE: For emergency exposures above 4 rem, the placement of several dosimeters on an individual is recommended to determine spatial distribution of dose to the individual.**

- 1.3.2 Evaluate need and placement of extremity dosimeters.

- 1.3.3 Evaluate need for additional dosimetry devices such as high range self-reading dosimeters, electronic dosimeters, and neutron dosimeters.

- 1.3.4 Evaluate need for time keeping.

- 1.4 Determine proper respirator equipment required to perform task.

**NOTE: For tasks expected to last more than several hours, consider need for relief of team members.**

- 1.5 Review the following ALARA items:

**NOTE: The detail and scope of ALARA reviews are to be commensurate with the magnitude of doses expected, numbers of people involved, and urgency of required task.**

- 1.5.1 Consider the trend of exposures vs. the importance of the task:

- a. Important and critical task with rising exposure rates will require the dispatch of teams as quickly as possible to reduce exposures.
    - b. Unimportant or less critical task could be delayed until exposure rates begin to trend downward.

**HEALTH PHYSICS AND ALARA CONSIDERATIONS  
DURING EMERGENCIES  
(continued)**

**CHECK**

1.5.2 When time permits the following should be included in the ALARA review:

- a. Consider the use of remote handling devices or other special tools.
- b. Consider the use of portable shielding.
- c. Consider the need for mock-ups or other practice exercises.
- d. Assess the number of people required to assure all have essential productive roles.
- e. Consider the magnitude of doses received by team members in transit to work location.

# MIDAS OPERATING PROCEDURE

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## A. INTRODUCTION/SYSTEM STARTUP

1. The following conventions are used in this procedure to describe computer operations:
  - a. Bold, upper case text (i.e., **CURRENT DATE**), denotes text which appears on the screen.
  - b. Underlined, uppercase text (i.e., LOGIN) denotes text to be typed.
  - c. Bracketed, upper case text (i.e., [ENTER]), denotes special keys which are to be pressed.
  - d. Most mouse selections can be made with a single click.
    - Single click **RESET** to cancel previous screen selections.
    - Double click **RESET** to back out of present menu.
    - Double click to **EXIT** menu.
2. The met and vent spreadsheet will appear with all of the meteorological and ventilation release rate parameters across the top of the page. The current time period is highlighted in the left-hand column. The first time interval is 2 hours before the current time and the last time interval is 16 hours after the current time.
3. All required meteorological and ventilation data for MIDAS can be obtained using the MET/VENT DATA ACQUISITION OPTIONS tab.
4. To start MIDAS:
  - a. Turn ON each component (monitor, computer, and printer) of the computer system on which MIDAS is loaded.
  - b. At the MIDAS logon screen, enter the password **MIDAS** and [ENTER].
  - c. At the MIDAS MAIN MENU screen, select A: MIDAS (Dose Calculator) and [ENTER].
  - d. The system will then display the **CURRENT DATE**. If the date is correct, press [ENTER]. If this date is incorrect, type the correct date using the format which is illustrated in the prompt and press [ENTER].
  - e. The system will then display the **CURRENT TIME**, which is stored in the computer system's clock (24-hour clock format). If the time is correct, press [ENTER]. If this time is incorrect, type the correct time using the format which is illustrated in the prompt and press [ENTER].

- f. The MIDAS logon screen will now appear for 20 seconds.
  - g. The **ACCIDENT MENU SELECTION** screen will appear. Use the **AIRBORNE DOSE ASSESSMENT FLOWCHART** to select the appropriate calculation option and **CONFIRM** your selection.
5. To exit MIDAS, double-click **EXIT** on each menu screen that appears. At the **SECURITY MENU**, press [F8] to log off.

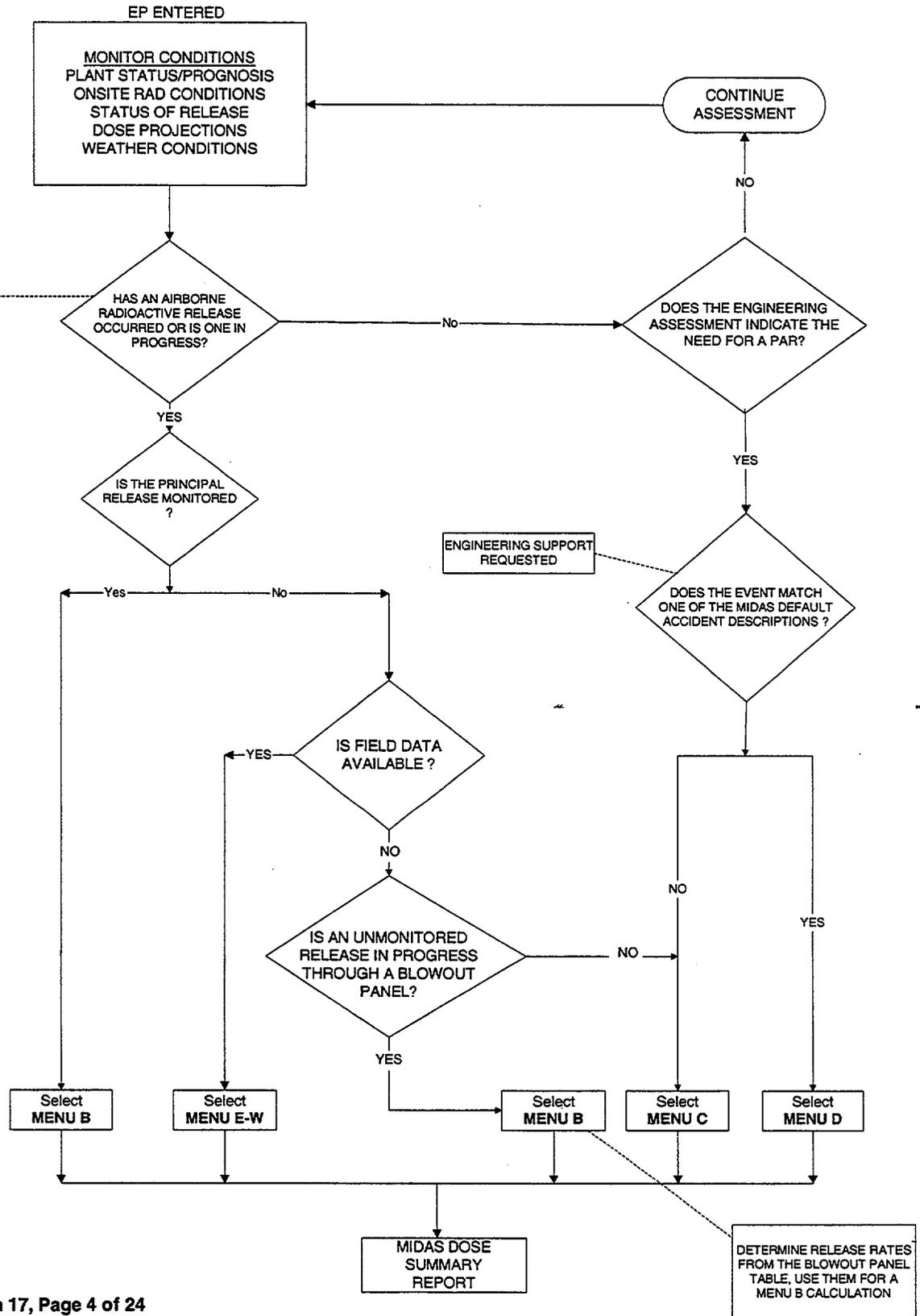
# AIRBORNE DOSE ASSESSMENT FLOW CHART

A RADIOLOGICAL RELEASE HAS OCCURRED OR ONE IS IN PROGRESS IF ANY OF THESE HAVE BEEN EXCEEDED:

**SPING SITE TOTAL RELEASE RATES**  
 NOBLE GAS: 8.51E+05 uCi/min  
 I-131: 1.04E+02 uCi/min  
 PARTICULATES: 7.72E+02 uCi/min

**FIELD TEAM MEASUREMENTS**  
 WHOLE BODY: 0.1 MR/HR  
 THYROID: 68.4 mrem/hr RMS (CARTRIDGE) or 100 NET CPM

REVISED: 10/13/2000



**EVALUATION OF UNMONITORED RELEASES  
FROM STATION BLOWOUT PANELS**

**DIRECTIONS**

1. Select the appropriate station blowout panel location.
2. Select an appropriate accident source term mix.
3. Use the corresponding design base release rates for input into MENU B.
4. Enter the release rates for one (1) fifteen-minute time period.

NOTE: If Clad Failure or Fuel Melt mixes are selected, multiply the site total noble gas, I-131, and particulate release rates by the appropriate fraction of clad failure or fuel melt prior to entering the values onto the vent spreadsheet (e.g., the multiplier for 50% FUEL MELT would be 0.5).

[ 1 ] BLOWOUT PANEL LOCATION	[ 3 ] DESIGN BASIS (SITE TOTAL) RELEASE RATES		
	NOBLE GAS ( $\mu\text{Ci}/\text{min}$ )	I-131 ( $\mu\text{Ci}/\text{min}$ )	PARTICULATE ( $\mu\text{Ci}/\text{min}$ )
<b>RCIC PUMP ROOM</b>			
[ 2 ] ACCIDENT SOURCE TERM			
Normal Reactor Coolant Activity	1.2E+02*	1.8E+02	1.1E+03
(LOCA) Reactor Depressurization-No FD	2.6E+06	8.4E+04	2.2E+04
(LOCA) 100% Clad Failure	2.1E+09	2.4E+08	9.1E+07
(LOCA) 100% Fuel Melt	4.3E+10	1.3E+09	1.7E+09

<b>HPCI PUMP ROOM</b>	( $\mu\text{Ci}/\text{min}$ )	( $\mu\text{Ci}/\text{min}$ )	( $\mu\text{Ci}/\text{min}$ )
Normal Reactor Coolant Activity	2.1E+03*	3.2E+03	1.9E+04
(LOCA) Reactor Depressurization-No FD	4.6E+07	1.5E+06	3.8E+05
(LOCA) 100% Clad Failure	3.7E+10	4.3E+09	1.6E+09
(LOCA) 100% Fuel Melt	7.5E+11	2.3E+10	3.0E+10

<b>HPCI/RCIC ROUTING AREA</b>	( $\mu\text{Ci}/\text{min}$ )	( $\mu\text{Ci}/\text{min}$ )	( $\mu\text{Ci}/\text{min}$ )
Normal Reactor Coolant Activity	3.2E+03*	4.9E+03	2.9E+04
(LOCA) Reactor Depressurization-No FD	7.0E+07	2.2E+06	5.8E+05
(LOCA) 100% Clad Failure	5.7E+10	6.5E+09	2.4E+09
(LOCA) 100% Fuel Melt	1.1E+12	3.5E+10	4.6E+10

<b>RWCU PENETRATION ROOM</b>	( $\mu\text{Ci}/\text{min}$ )	( $\mu\text{Ci}/\text{min}$ )	( $\mu\text{Ci}/\text{min}$ )
Normal Reactor Coolant Activity	7.3E+03*	5.8E+03	6.6E+04
(LOCA) Reactor Depressurization-No FD	1.6E+08	2.6E+06	1.3E+06
(LOCA) 100% Clad Failure	1.3E+11	7.6E+09	5.5E+09
(LOCA) 100% Fuel Melt	2.6E+12	4.1E+10	1.0E+11

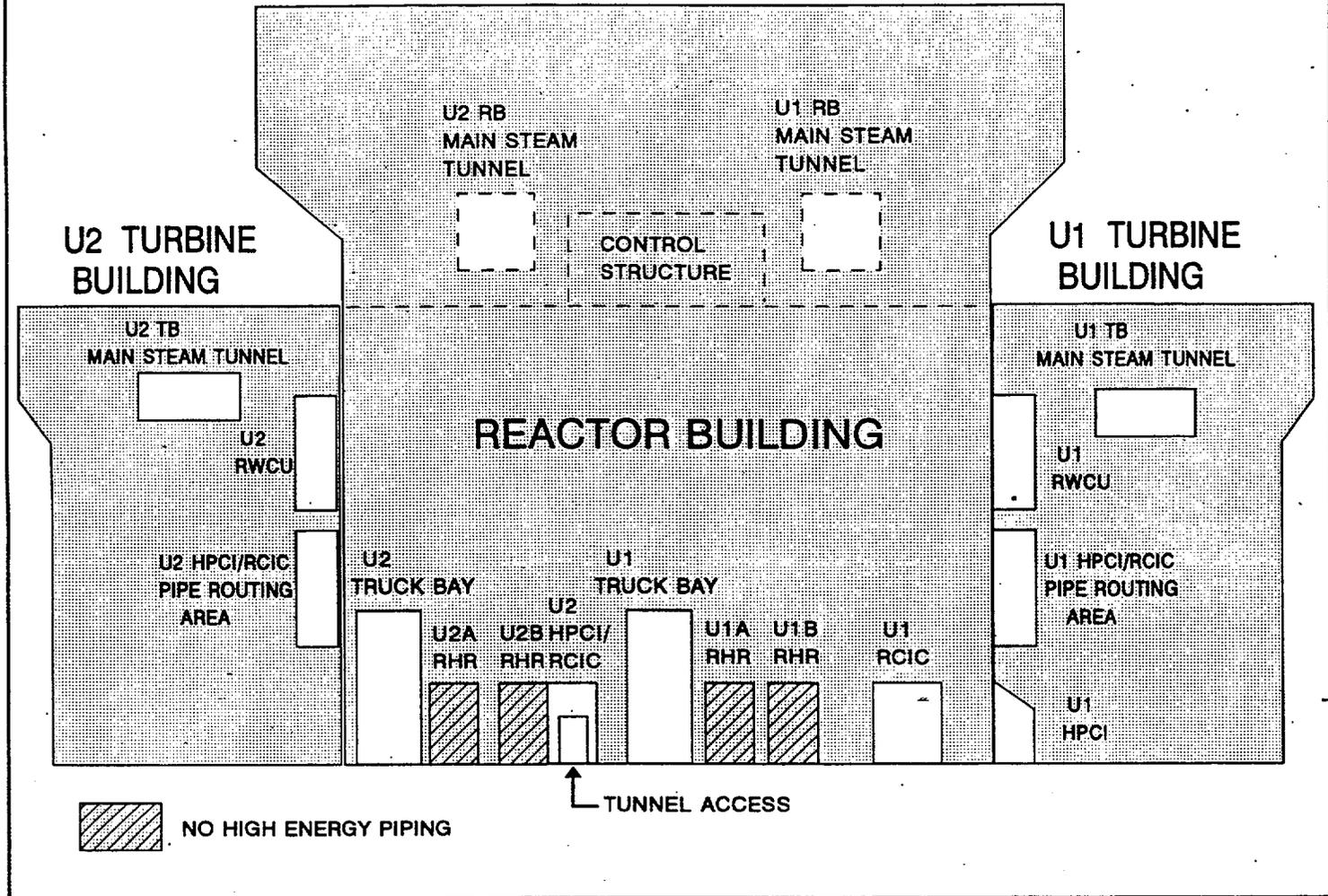
<b>RB/TB MAIN STEAM TUNNEL</b>	( $\mu\text{Ci}/\text{min}$ )	( $\mu\text{Ci}/\text{min}$ )	( $\mu\text{Ci}/\text{min}$ )
Normal Reactor Coolant Activity	2.6E+04*	3.9E+04	2.3E+05
(LOCA) Reactor Depressurization-No FD	5.6E+08	1.8E+07	4.7E+06
(LOCA) 100% Clad Failure	4.6E+11	5.2E+10	1.9E+10
(LOCA) 100% Fuel Melt	9.1E+12	2.8E+11	3.7E+11

FD = FUEL DAMAGE

\* Value less than that defining a release (See previous page).

REFERENCE: EC-RADN-1018, Evaluation of Unmonitored Releases from Station Blowout Panels, Revision 2, File R2-1.

# SSES BLOWOUT PANEL LOCATIONS



**B. MENU B: FORWARD CALCULATIONS**

**REQUIRED INPUTS**

ENGINEERING OR OPERATIONS SUPPORT IS REQUESTED FOR THESE CALCULATIONS.

**PLANT CONDITIONS**

- TIME OF REACTOR SHUTDOWN
- RELEASE START TIME
- DURATION OF RELEASE
- PROJECTION TIME
- ACCIDENT SOURCE TERM SELECTION

**MET DATA**

- 10 M WIND SPEED
- 10 M WIND DIRECTION
- STABILITY CLASS
- PRECIPITATION RATE

**VENT DATA**

- SITE TOTAL NOBLE GAS RELEASE RATES
- SITE TOTAL I-131 RELEASE RATES
- SITE TOTAL PARTICULATE RELEASE RATES

1. The **MET/VENT DATA CONTROL TABLE** screen will appear.
  - a. Select **START NEW SCENARIO** and then **CONFIRM, OR**
  - b. If you have already initiated calculations and wish to modify either the existing met spreadsheet file or vent spreadsheet, select **CURRENT SCENARIO EDIT** and **CONFIRM**.
  - c. Other options are available in the lower right hand section of the display if you wish to **RESET** or change your initial selection or **EXIT** the screen.
2. The **METEOROLOGICAL DATA** spreadsheet will appear with all of the required meteorological parameters across the top of the page. Place the cursor on the data period corresponding to the start of release. Input the following met data:

**NOTE 1:** If the met data remains the same for successive time periods, the operator need only enter the met data once. MIDAS will persist the data to future time periods automatically.

**NOTE 2:** Any time historical data is being used in MIDAS (i.e., met and vent data entered into the spreadsheets within the two-hour period up to and including the current time), all met and vent data must be manually entered over all affected time periods up to and including the current time.

If a value is to be repeated in a field it can still be manually copied down the spreadsheet using the **K** (copy last) key while that value is highlighted.

a. In the column labeled **10M SPD**, enter the wind speed from the 10 meter onsite (primary) meteorological tower in MILES PER HOUR (MPH).

**NOTE 1:** If the primary meteorological tower data is not available, refer to the Met Vent Data Acquisition Options tab for other options.

b. In the column labeled **10M WD**, enter the wind direction from the 10-meter onsite (primary) meteorological tower in DEGREES FROM (DEG FM).

c. In the column labeled **STAB CLS**, enter the actual value for  $\Delta T$  in DEGREES CENTIGRADE (preferred method) or the wind speed corrected stability class (Letter Code) if the primary tower data is not available. MIDAS will convert the letter entry to a numerical value.

d. In the column labeled **RAIN-LMH**, enter the precipitation rate in INCHES PER 15 MINUTES (IN/15M). Divide the PICSY precipitation rate (inches/hr) by 4. If the precipitation rate is not available, estimation may be made by using the following table:

<b>NO PRECIPITATION</b>	<b>0(zero)</b>
<b>DRIZZLE or MIST</b>	<b>LIGHT</b>
<b>STEADY RAIN</b>	<b>MEDIUM</b>
<b>HEAVY DOWNPOUR</b>	<b>HEAVY</b>

e. Type **X** when all data has been entered to save the data and exit out of the meteorological spreadsheet.

3. A **WEATHER SELECTION** screen will appear if any of the meteorological data inputs are missing from the spreadsheet.

a. If this screen appears, select **RESET** until you have returned to the **MET/VENT DATA CONTROL TABLE** screen.

- b. Select **CURRENT SCENARIO EDIT** and enter any missing meteorological values on the spreadsheet.
  - c. Type **X** when all data has been entered to save the data and exit out of the meteorological spreadsheet.
4. The vent (GASEOUS VENT AND FLOW) spreadsheet will appear next. Enter vent data from the **START OF RELEASE**. The data entry for each 15-minute period is as follows:

**NOTE:** Vent data may be entered in a regular numerical presentation (10000) or in scientific notation (1.0E+04).

- a. In the column labeled **TOT NG RELEASE**, enter the site total noble gas release rate in  $\mu\text{Ci}/\text{min}$ .
  - b. In the column labeled **TOT I-131 RELEASE**, enter the site total I-131 release rate in  $\mu\text{Ci}/\text{min}$ .
  - c. In the column labeled **TOT P RELEASE**, enter the site total particulate release rate in  $\mu\text{Ci}/\text{min}$ .
  - d. When the data entry is complete, press the **X** key to save the information and exit the spreadsheet.
5. From the **ACCIDENT SOURCE TERM SELECTION** screen, select an appropriate accident source term, then **CONFIRM**. Select **RESET** if you wish to change your previous selection.

If no specific information on the type of release is available from Engineering, use the following as a guide in the selection of appropriate accident source term.

- a. From PICSY, obtain readings for the Containment High Range Radiation Monitors (CHRM). These are computer points MAR01 and MAR02, and obtain the current reactor power level.
- b. Ensure the CHRM values are within reasonable agreement; if not, use the higher value.
- c. If the reactor is operating at greater than 10% power, select the **ATWS** source term.
- d. With the reactor at less than 10% power and if the CHRM reading is less than 5 R/hr, select **Normal Rx Coolant Activity**.

- e. If the CHRM reading is greater than 5 R/hr but less than 200 R/hr, select **LOCA (RX DP-No FD)**.
  - f. If the CHRM reading is greater than 200 R/hr but less than 2000 R/hr, select **LOCA (Clad Failure)**.
  - g. If the CHRM reading is great than 2000 R/hr, select **LOCA (Fuel Melt)**.
  - h. If conditions indicate a fuel handling incident and a release from the refueling floor (Reactor Building floor 818'), select **Fuel Handling Accident**.
6. The **RELEASE TIMING SELECTION** screen will appear next. There are three lines to the screen.
- a. On Line 1, select **TRIP DATE** (date and time of reactor trip). Using the calendar wheel, enter the appropriate date and time of reactor trip. **CONFIRM** to close the calendar wheel.
    - 1) The time of reactor trip must be equal to or earlier than the **START OF RELEASE**.
    - 2) The time of reactor trip can be set up to roughly one year (8,190 hours) prior to the **START OF RELEASE**.
  - NOTE 1:** MIDAS assumes the reactor must be shutdown before a release can occur. The **TRIP DATE** triggers the start of decay for the accident mix.
  - NOTE 2:** Even during an **ATWS**, where a release is in progress and the reactor has not shut down, a **TRIP DATE** must be entered to run MIDAS. It is recommended the same date and time for the **START OF RELEASE** be used for the **TRIP DATE**. Entering a date and time for reactor trip has no impact on decay of the **ATWS** mix.
  - b. On Line 2, select **START OF RELEASE DATE**. Using the calendar wheel, enter the appropriate date and time of the start of release. **CONFIRM** to close the calendar wheel.
    - NOTE:** The **START OF RELEASE** is defined as the date and time of the first vent data entry. This time range includes the two-hour period prior to and including the current time.

- c. On Line 3, select **REMAINING DURATION**. Using the NUMPAD enter the duration of release, in minutes, and select **EN** or press **[ENTER]** to close the numpad. If the duration of release is not known, use the default of 360 minutes.

**NOTE:** The **REMAINING DURATION** (DURATION OF RELEASE) can use forecasted or persisted data for up to 16 hours into the future.

- d. Select **CONFIRM** to continue with the calculation or **RESET** to change any of your previous choices.
7. The **PP&L SUMMARY DATA SELECTION** screen allows the user to select different options for the **MIDAS DOSE SUMMARY REPORT**.
    - a. Select the projection time from the left-hand column if other than the default of six hours is needed.
    - b. Select the **PEAK SECTOR** dose rate option if other than the default **CURRENT AFFECTED SECTOR** is required; then **CONFIRM**. If you wish to change any of your previous choices, select **RESET**.

**NOTE:** The **PEAK SECTOR** is used to determine the highest dose rate in all 16 sectors. The **CURRENT AFFECTED SECTOR** is used to estimate dose rates based on current wind speed and direction.

8. After the calculations have completed, the **MIDAS DOSE SUMMARY REPORT** will be displayed on the screen.
  - a. If you want to select a different projection time or sector designation from the **PP&L SUMMARY DATA SELECTION** screen, select **RESTART REPORT**.
  - b. If you wish to view additional report options, select **CONTINUE** and, on the next page, **MORE REPORTS**.
  - c. If you wish to continue with the next calculation, double click **EXIT**. This will return you to the **ACCIDENT MENU SELECTION** screen where the dose calculation process can be repeated using updated input values.
  - d. If a hard copy is desired of any printout or plot displayed on the screen, press **[PRINT SCR]**.

**NOTE:** If a hard-copy printout is made of the **MIDAS DOSE SUMMARY REPORT**, be sure to fill in the required information documenting the name of the dose calculator, reviewer, and date the calculation was performed.

C. **MENU C: EVENT TREE NUREG-1228 CALCULATIONS**

**REQUIRED INPUTS**

ENGINEERING OR OPERATIONS SUPPORT IS REQUESTED FOR THESE CALCULATIONS.

**PLANT CONDITIONS**

- RELEASE PATHWAY
- CORE CONDITION
- CONTAINMENT CONDITIONS
- FILTRATION
- PROJECTION TIME

**MET DATA**

- 10 M WIND SPEED
- 10 M WIND DIRECTION
- STABILITY CLASS
- PRECIPITATION RATE

1. The **EVENT TREE NUREG-1228 SELECTION** screen will appear.
  - a. Using information provided by Engineering Support or Operations, select one cell in each row of the menu. When a cell in the current row is selected, the next row then appears.
  - b. **[PRINT SCREEN]** when final selections are made on the **EVENT TREE NUREG-1228 SELECTION** screen to document the calculation inputs.
  - c. **CONFIRM** entries to continue with the calculation or **RESET** if you wish to change any of your selections. You may also double-click **EXIT** to return to the **ACCIDENT MENU SELECTION** screen.
2. The **MET/VENT DATA CONTROL TABLE** screen will appear.
  - a. Select **START NEW SCENARIO** and then **CONFIRM, OR**
  - b. If you have already initiated calculations and wish to modify the existing met spreadsheet file, select **CURRENT SCENARIO EDIT** and **CONFIRM**.
  - c. Other options are available in the lower right hand section of the display if you wish to **RESET** your initial entries or **EXIT** the screen.

3. The **METEOROLOGICAL DATA** spreadsheet will appear with all of the required meteorological parameters across the top of the page.

**NOTE:** Ensure met data is entered for the current time. MIDAS will persist the data to future time periods automatically.

- a. In the column labeled **10M SPD**, enter the wind speed from the 10-meter onsite (primary) meteorological tower in MILES PER HOUR (MPH).

**NOTE 1:** If the primary meteorological tower data is not available, refer to the Met Vent Data Acquisition Options tab for other options.

- b. In the column labeled **10M WD**, enter the wind direction from the 10-meter onsite (primary) meteorological tower in DEGREES FROM (DEG FM).

- c. In the column labeled **STAB CLS**, enter the actual value for  $\Delta T$  in DEGREES CENTIGRADE (preferred method) or the wind speed corrected stability class (Letter Code) if the primary tower data is not available. MIDAS will convert the letter entry to a numerical value.

- d. In the column labeled **RAIN-LMH**, enter the precipitation rate in INCHES PER 15 MINUTES (IN/15M). Divide the PICSY precipitation rate (inches/hr) by 4. If the precipitation rate is not available, estimation may be made by using the following table:

<b>NO PRECIPITATION</b>	<b>0(zero)</b>
<b>DRIZZLE or MIST</b>	<b>LIGHT</b>
<b>STEADY RAIN</b>	<b>MEDIUM</b>
<b>HEAVY DOWNPOUR</b>	<b>HEAVY</b>

- e. Type **X** when all data has been entered to save the data and exit out of the meteorological spreadsheet.

4. A **WEATHER SELECTION** screen will appear if any of the meteorological data inputs are missing from the spreadsheet.

- a. If this screen appears, select **RESET** until you have returned to the **MET/VENT DATA CONTROL TABLE** screen.

- b. Select **CURRENT SCENARIO EDIT** and enter any missing meteorological values on the spreadsheet.

- c. Type **X** when all data has been entered to save the data and exit out of the meteorological spreadsheet.

5. The **PP&L SUMMARY DATA SELECTION** screen allows the user to select different options for the **MIDAS DOSE SUMMARY REPORT**.

- a. Select the projection time from the left-hand column if other than the default of six hours is needed.
- b. Select the **PEAK SECTOR** dose rate option if other than the default **CURRENT AFFECTED SECTOR** is required; then **CONFIRM**. If you wish to change any of your previous choices, select **RESET**.

**NOTE:** The **PEAK SECTOR** is used to determine the highest dose rate in all 16 sectors. The **CURRENT AFFECTED SECTOR** is used to estimate dose rates based on current wind speed and direction.

6. After the calculations have completed, the **MIDAS DOSE SUMMARY REPORT** will be displayed on the screen.

- a. If you want to select a different projection time or sector designation from the **PP&L SUMMARY DATA SELECTION** screen, select **RESTART PROGRAM**.
- b. If you wish to view additional report options, select **CONTINUE** and, on the next page, **MORE REPORTS**.
- c. If you wish to continue with the next calculation, double click **EXIT**. This will return you to the **ACCIDENT MENU SELECTION** screen where the dose calculation process can be repeated using updated input values.
- d. If a hard copy is desired of any printout or plot displayed on the screen, press **[PRINT SCR]**.

**NOTE:** If a hard-copy printout is made of the **MIDAS DOSE SUMMARY REPORT**, be sure to fill in the required information documenting the name of the dose calculator, reviewer, and date the calculation was performed.

**D. MENU D: DEFAULT ACCIDENT CALCULATIONS**

**REQUIRED INPUTS**

ENGINEERING OR OPERATIONS SUPPORT IS REQUESTED FOR THESE CALCULATIONS.

**MET DATA**

- 10 M WIND SPEED
- 10 M WIND DIRECTION
- STABILITY CLASS
- PRECIPITATION RATE

**SOURCE TERM**

- ACCIDENT SOURCE TERM SELECTION
- PERCENT OF CLAD FAILURE OR FUEL MELT
- PROJECTION TIME

1. The **MET/VENT DATA CONTROL TABLE** screen will appear.
  - a. Select **START NEW SCENARIO** and then **CONFIRM**.
  - b. If you have already initiated calculations and wish to modify the existing met spreadsheet file, select **CURRENT SCENARIO EDIT** and **CONFIRM**.
  - c. Other options are available in the lower right hand section of the display if you wish to **RESET** your initial entries or **EXIT** the screen.
2. The **METEOROLOGICAL DATA** spreadsheet will appear with all of the required meteorological parameters across the top of the page.

**NOTE:** Ensure met data is entered for the current time. MIDAS will persist the data to future time periods automatically.

- a. In the column labeled **10M SPD**, enter the wind speed from the 10-meter onsite (primary) meteorological tower in **MILES PER HOUR (MPH)**.

**NOTE 1:** If the primary meteorological tower data is not available, refer to the Met Vent Data Acquisition Options tab for other options.

- b. In the column labeled **10M WD**, enter the wind direction from the 10-meter onsite (primary) meteorological tower in **DEGREES FROM (DEG FM)**.

- c. In the column labeled **STAB CLS**, enter the actual value for  $\Delta T$  in DEGREES CENTIGRADE (preferred method) or the wind speed corrected stability class (Letter Code) if the primary tower data is not available. MIDAS will convert the letter entry to a numerical value.
- d. In the column labeled **RAIN-LMH**, enter the precipitation rate in INCHES PER 15 MINUTES (IN/15M). Divide the PICSY precipitation rate (inches/hr) by 4. If the precipitation rate is not available, estimation may be made by using the following table:

<b>NO PRECIPITATION</b>	<b>0(zero)</b>
<b>DRIZZLE or MIST</b>	<b>LIGHT</b>
<b>STEADY RAIN</b>	<b>MEDIUM</b>
<b>HEAVY DOWNPOUR</b>	<b>HEAVY</b>

- e. Type **X** when all data has been entered to save the data and exit out of the meteorological spreadsheet.
3. A **WEATHER SELECTION** screen will appear if any of the meteorological data inputs are missing from the spreadsheet.
    - a. If this screen appears, select **RESET** until you have returned to the **MET/VENT DATA CONTROL TABLE** screen.
    - b. Select **CURRENT SCENARIO EDIT** and enter any missing meteorological values on the spreadsheet.
    - c. Type **X** when all data has been entered to save the data and exit out of the meteorological spreadsheet.
  4. From the **ACCIDENT SOURCE TERM SELECTION** screen, select an appropriate accident source term, then **CONFIRM**.
  5. A **PERCENT FAILURE FOR LOCA** screen will appear if the clad failure or fuel melt accident source term is selected. Input the percent of clad failure or fuel melt using the numpad and **CONFIRM**.
  6. The **PP&L SUMMARY DATA SELECTION** screen allows the user to select different options for the **MIDAS DOSE SUMMARY REPORT**.
    - a. Select the projection time from the left-hand column if other than the default of six hours is needed.
    - b. Select the **PEAK SECTOR** dose rate option if other than the default **CURRENT AFFECTED SECTOR** is required; then **CONFIRM**. If you wish to change any of your previous choices, select **RESET**.

**NOTE:** The **PEAK SECTOR** is used to determine the highest dose rate in all 16 sectors. The **CURRENT AFFECTED SECTOR** is used to estimate dose rates based on current wind speed and direction.

7. After the calculations have completed, the **MIDAS DOSE SUMMARY REPORT** will be displayed on the screen.
  - a. If you want to select a different projection time or sector designation from the **PP&L SUMMARY DATA SELECTION** screen, select **RESTART PROGRAM**.
  - b. If you wish to view additional report options, select **CONTINUE** and, on the next page, **MORE REPORTS**.
  - c. If you wish to continue with the next calculation, double click **EXIT**. This will return you to the **ACCIDENT MENU SELECTION** screen where the dose calculation process can be repeated using updated input values.
  - d. If a hard copy is desired of any printout or plot displayed on the screen, press **[PRINT SCR]**.

**NOTE:** If a hard-copy printout is made of the **MIDAS DOSE SUMMARY REPORT**, be sure to fill in the required information documenting the name of the dose calculator, reviewer, and date the calculation was performed.

**E. MENU E-W: BACK CALCULATIONS**

**REQUIRED INPUTS**

ENGINEERING OR OPERATIONS SUPPORT IS REQUESTED FOR THESE CALCULATIONS.

**PLANT CONDITIONS**

- TIME OF REACTOR SHUTDOWN
- RELEASE START TIME
- DURATION OF RELEASE
- ACCIDENT SOURCE TERM SELECTION
- PROJECTION TIME

**MET DATA**

- 10 M WIND SPEED
- 10 M WIND DIRECTION
- STABILITY CLASS
- PRECIPITATION RATE

**FIELD DATA**

- 3 FT (CW) SURVEY METER READING
- DISTANCE FROM PLANT
- IODINE CARTRIDGE NET CPM OR DEFAULT IODINE MIX

1. The **MET/VENT DATA CONTROL TABLE** screen will appear.
  - a. Select **START NEW SCENARIO** and then **CONFIRM**.
  - b. If you have already initiated calculations and wish to modify the existing met spreadsheet file, select **CURRENT SCENARIO EDIT** and **CONFIRM**.
  - c. Other options are available in the lower right hand section of the display if you wish to **RESET** your initial entries or **EXIT** the screen.
2. The **METEOROLOGICAL DATA** spreadsheet will appear with all of the required meteorological parameters across the top of the page.

**NOTE:** Ensure met data is entered for the current time. MIDAS will persist the data to future time periods automatically.

- a. In the column labeled **10M SPD**, enter the wind speed from the 10-meter onsite (primary) meteorological tower in MILES PER HOUR (MPH).

**NOTE 1:** If the primary meteorological tower data is not available, refer to the Met Vent Data Acquisition Options tab for other options.

- b. In the column labeled **10M WD**, enter the wind direction from the 10-meter onsite (primary) meteorological tower in DEGREES FROM (DEG FM).
- c. In the column labeled **STAB CLS**, enter the actual value for  $\Delta T$  in DEGREES CENTIGRADE (preferred method) or the wind speed corrected stability class (Letter Code) if the primary tower data is not available. MIDAS will convert the letter entry to a numerical value.
- d. In the column labeled **RAIN-LMH**, enter the precipitation rate in INCHES PER 15 MINUTES (IN/15M). Divide the PICSY precipitation rate (inches/hr) by 4. If the precipitation rate is not available, estimation may be made by using the following table:

<b>NO PRECIPITATION</b>	<b>0(zero)</b>
<b>DRIZZLE or MIST</b>	<b>LIGHT</b>
<b>STEADY RAIN</b>	<b>MEDIUM</b>
<b>HEAVY DOWNPOUR</b>	<b>HEAVY</b>

- e. Type **X** when all data has been entered to save the data and exit out of the meteorological spreadsheet.
3. A **WEATHER SELECTION** screen will appear if any of the meteorological data inputs are missing from the spreadsheet.
    - a. If this screen appears, select **RESET** until you have returned to the **MET/VENT DATA CONTROL TABLE** screen.
    - b. Select **CURRENT SCENARIO EDIT** and enter any missing meteorological values on the spreadsheet.
    - c. Type **X** when all data has been entered to save the data and exit out of the meteorological spreadsheet.
  4. From the **ACCIDENT SOURCE TERM SELECTION** screen, select an appropriate accident source term, then **CONFIRM**.
  5. The next screen is the **FIELD MONITOR PARAMETER SELECTION** screen. Select the appropriate cells and input the information requested using the numpad on the screen or enter the data using the computer keyboard. Once the data entry is complete, **CONFIRM** to continue with the calculation.

- a. If air sample data is available, enter either the **IODINE CARTRIDGE** reading in net counts per minute or an **IODINE CONCENTRATION** value in  $\mu\text{Ci/cc}$ . A zero (0) value may be entered for the net count per minute or the  $\mu\text{Ci/cc}$  measurement, if indicated.
  - b. Select the **DEFAULT MIX** option if you wish to characterize the iodine source term when air sample data is not available.
6. On the **RELEASE TIMING SELECTION** screen, enter the estimated remaining duration for the release, then **CONFIRM**. If the duration of release is not known, use the default of 360 minutes.
7. The **PP&L SUMMARY DATA SELECTION** screen allows the user to select different options for the **MIDAS DOSE SUMMARY REPORT**.
- a. Select the projection time from the left-hand column if other than the default of six hours is needed.
  - b. Select the **PEAK SECTOR** dose rate option if other than the default **CURRENT AFFECTED SECTOR** is required; then **CONFIRM**. If you wish to change any of your previous choices, select **RESET**.

**NOTE:** The **PEAK SECTOR** is used to determine the highest dose rate in all 16 sectors. The **CURRENT AFFECTED SECTOR** is used to estimate dose rates based on current wind speed and direction.

8. After the calculations have completed, the **MIDAS DOSE SUMMARY REPORT** will be displayed on the screen.
- a. If you want to select a different projection time or sector designation from the **PP&L SUMMARY DATA SELECTION** screen, select **RESTART PROGRAM**.
  - b. If you wish to view additional report options, select **CONTINUE** and, on the next page, **MORE REPORTS**.
  - c. If you wish to continue with the next calculation, double click **EXIT**. This will return you to the **ACCIDENT MENU SELECTION** screen where the dose calculation process can be repeated using updated input values.
  - d. If a hard copy is desired of any printout or plot displayed on the screen, press **[PRINT SCR]**.

**NOTE:** If a hard-copy printout is made of the **MIDAS DOSE SUMMARY REPORT**, be sure to fill in the required information documenting

the name of the dose calculator, reviewer, and date the calculation was performed.

- e. Remote Monitoring System perimeter monitoring location dose rates can be displayed by MIDAS using the perimeter monitoring dose rate screen option.

**NOTE:** The displayed values are only numeric dose estimates based on MIDAS calculations. They are not "real-time" readings from the perimeter monitor system.

Directions for accessing the MIDAS perimeter monitor dose rate screen option are as follows:

- 1) At the **MIDAS DOSE SUMMARY REPORT** screen, select **CONTINUE**.
- 2) On the next screen select **MORE REPORTS**.
- 3) From the **MORE REPORTS SELECTION** screen, select **FM GAMMA DOSE RATE PLOT** and **CONFIRM**.
- 4) From the **REPORT PARAMETER SELECTION** screen, choose the appropriate projection time and **CONFIRM**.
- 5) From the **MAP SELECTION** screen, select **MAP SCALE** and input 1.25 miles, then **CONFIRM**.
- 6) On the next screen, select **MAP FEATURES**.
- 7) On the next screen, select **CALCULATED PERIMETER MON DOSE RATES** and **CONFIRM**.
- 8) To exit, select **CONTINUE, MORE REPORTS, and EXIT**.

F. **DESCRIPTION OF INFORMATION PROVIDED ON THE MIDAS DOSE SUMMARY REPORT**

1. **PRINT DATE/TIME**

Date and time MIDAS DOSE SUMMARY REPORT was printed.

2. **CURRENT TIME PERIOD**

Current meteorological time period used for dose projections provided on quarter hour increments to match met spreadsheet entries.

3. **REACTOR SHUTDOWN**

Date and time of reactor shutdown.

4. **START OF RELEASE**

This is the date and time of first dose calculation as indicated by the first positive vent release rate value entered on the vent data spreadsheet or if the vent spreadsheet is not used, the date and time of the met data used for the current projection period.

**NOTE:** For MENU C: NR-1228 CALCULATIONS, MENU D: DEFAULT CALCULATIONS, and MENU E-W: BACK CALCULATIONS, it is conservatively assumed that the date and time of reactor shutdown is concurrent with the start of release.

5. **MENU SELECTION**

Identifies the dose calculation option used for the current dose projection summary report. Choice of four options:

- MENU B: FORWARD CALCULATIONS
- MENU C: NR-1228 CALCULATIONS
- MENU D: DEFAULT CALCULATIONS
- MENU E-W: BACK CALCULATIONS

6. **SOURCE TERM**

Identifies the source term used for the current dose projection summary report calculations. Choice of six options:

- ATWS-Normal Reactor Coolant Activity (UNDECAYED)
- Normal Reactor Coolant Activity (DECAYED)

- (LOCA) Coolant Activity Leak with Depressurization Spike-No Fuel Damage
- (LOCA) Cladding Failure-Gap Release
- (LOCA) Fuel Melt-Early In-Vessel Release
- Fuel Handling Accident

7. **MET DATA**

Meteorological data (wind speed, wind direction, stability class, and precipitation rate) used for the summary report dose projections.

8. **CURRENT AFFECTED SECTOR OR PEAK SECTOR DOSE RATES**

This table provides the TEDE, EDE, and THYROID CDE dose rates calculated at the OSCAR and EPB distances. These rate calculations are based on a variable projection/integration period for the current affected sector or peak sector.

9. **PROJECTED DOSES**

This table provides a TEDE and THYROID CDE dose projection calculated at the OSCAR, EPB, 2-mile, and 10-mile distances for varying projection times. The projection time will appear in the header line e.g., 4 HOUR PROJECTED DOSES on the MIDAS DOSE SUMMARY REPORT. The sector designation for this dose projection is based on the maximum calculated dose determined from all sixteen sectors for the given projection time.

10. **CALCULATED/REVIEWED BY**

The sign-off for review of calculation results is done for documentation purposes. The intended review does not necessarily mean an independent verification of each input to the calculation but more an interactive discussion between the RPC/HP Level II Dose Calculator and/or DASU/DAST (or dose calculator) to ensure the calculated results are reasonable based on current plant and environmental information.

This review should occur before the calculated results are used for any emergency classification determinations or protective action recommendations.

11. **COMMENTS**

Section added to provide space for additional statements of qualification or background information pertaining to the dose projections.

## MIDAS DOSE SUMMARY REPORT

① PRINT DATE/TIME: 8/19/97 11:25      ② CURRENT TIME PERIOD: 8/19/97 11:30

## MIDAS DOSE SUMMARY REPORT

③ REACTOR SHUTDOWN: 8/19/97 10:53      WIND SPEED (MPH): 5  
 ④ START OF RELEASE: 8/19/97 10:53      WIND FROM (DEG): 120 (ESE)  
 ⑤ MENU SELECTION: FORWARD CALCULATIONS      ⑦ STABILITY CLASS: D  
 ⑥ SOURCE TERM: LOCA (CLAD FAILURE)      PRECIPITATION: NO

**CURRENT (SITE TOTAL) RELEASE RATE**

(uCi/min)

<u>NOBLE GAS</u>	<u>I-131</u>	<u>PARTICULATES</u>
6.98E+09	9.96E+01	9.96E+01

⑧

CURRENT AFFECTED SECTOR DOSE RATES				
LOCATION	OSCAR		EPB	
UNITS	DOSE RATE (mrem/hr)	AFFECTED SECTOR	DOSE RATE (mrem/hr)	AFFECTED SECTOR
TEDE RATE	883.42	WNW	775.90	WNW
EDE RATE	883.42		775.90	
THY CDE RATE	0.22		0.16	

⑨

6.00 HOUR PROJECTED DOSES								
DISTANCE	OSCAR		EPB		2 MILE		10 MILE	
UNITS	DOSE (mrem)	PEAK SECTOR	DOSE (mrem)	PEAK SECTOR	DOSE (mrem)	PEAK SECTOR	DOSE (mrem)	PEAK SECTOR
TEDE	3.39E+03	WNW	3.02E+03	WNW	1.03E+03	WNW	29.96	WNW
CEDE	0.05		0.04		8.11E-03		2.66E-04	
PLUME	3.39E+03		3.02E+03		1.03E+03		29.96	
GND 4-DAY	0.02		0.02		3.36E-03		9.17E-05	
THY CDE	1.48	NW	1.01	NW	0.20	WNW	5.56E-03	WNW

⑩ CALCULATED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 ⑪ REVIEWED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 COMMENTS: \_\_\_\_\_

RESTART	<input type="checkbox"/>
REPORT	<input checked="" type="checkbox"/> CONTINUE

## MET/VENT DATA ACQUISITION OPTIONS

The following are sources of meteorological and ventilation data at Susquehanna SES:

### A. ACQUISITION OF MET/VENT DATA FROM THE PICSY TERMINAL

1. From the SSES LOGO display, select **E-PLAN MENU** or type **EPM** and **[ENTER]**.
2. All required meteorological and ventilation (MET/VENT) inputs for the MIDAS dose projections can be obtained by selecting the MET/VENT DATA display option on the E-PLAN menu.
  - a. Vent and Primary Met Tower Data is displayed on page 1 of this display.
  - b. Use the **PAGE FORWARD** command if the Back-up Tower data is required.
  - c. Should neither the Primary or Back-up Tower be available, obtain the Downriver Tower data as follows:
    - 1) Click on the **E-PLAN MENU** button at the top right hand corner of the MET/VENT DATA screen.
    - 2) On the E-Plan menu select and click on the **MET DATA** screen.
    - 3) Obtain the Downriver Tower wind speed (Point ID VMS05B), wind direction (Point ID VMX09B), and sigma theta (Point ID VMX10B).
    - 4) Return to the E-Plan menu by clicking on the **E-PLAN MENU** button at the bottom right hand corner of the MET DATA screen.
  - d. Other options – see Step 6 below.
3. If the Primary Met Tower  $\Delta T$  data is not available, determine the wind speed corrected stability class as follows:
  - a. Determine the initial (uncorrected) stability class using the measured value of sigma theta and the Supplemental Meteorological Information Table 1 (or page 2 of the PICSY screen).
  - b. Determine the wind speed corrected stability classification using the initial classification, the measured wind speed, and, as appropriate, either Table 2 or Table 3.

4. The PICSY QUALITY CODES for the display colors are as follows:

<b>YELLOW:</b>	<b>DATA ACCEPTABLE</b>
<b>RED:</b>	<b>DATA EXCEEDS WARNING LIMIT</b>
<b>MAGENTA:</b>	<b>DATA EXCEEDS ALARM SETPOINT</b>
<b>WHITE:</b>	<b>DATA SUSPECT</b>

5. If a hard copy printout of the information is required you may either:

a. Select the PRINT option using the pull down menu (screen copy takes approximately 3 minutes to complete); or

b. Initiate the MET/VENT DATA LOG option as follows:

1) On the E-PLAN menu, select the FREE FORMAT LOG MENU.

2) To activate the TSC log, press [F1], [22], and [ENTER].

To activate the EOF log, press [F1], [9], and [ENTER].

**NOTE: Be sure to read the log description because there are 2 logs for the TSC and 2 logs for the EOF.**

3) The log will start printing at the next quarter hour.

4) To deactivate the TSC log, press [F3], [22], and [ENTER].

To deactivate the EOF log, press [F3], [9], and [ENTER].

6. If historical MET/VENT information is required, refer to the following instructions:

a. At command line, type: GD ^METVENT1 and [ENTER].

b. Group point display for that display file will come up. Press the [F3] key for history. (See bottom of screen for F key menu.) A dialog box will appear.

c. The work file name to be used is ARCHIVE.D, which is the default for that field.

d. Enter the desired retrieval time. (Enter 15 for the delta time to receive a fifteen-minute period. Click on OK.)

e. Group point display will return with 1 or 2 point values.

- f. Press the **[F4]** key if you want to step slowly through the data. Press the **[F5]** key if you want to step quickly through the data. (See bottom of screen for F key menu for more options.)
- g. The group point display will return to real time when history is complete. A message at the top of the screen will alert you that it is returning to real time.

6. To exit the menu, select the **[ESC]** key.

B. Site-specific meteorological information can be obtained by contacting either ABS Consulting or the National Weather Service (NWS).

1. ABS Consulting

ABS Consulting is the primary meteorological contractor for the Susquehanna Steam Electric Station (SSES). ABS Consulting has the ability to interrogate the primary and backup meteorological towers on a real-time basis and provide short and long-term weather forecasts for the site and surrounding area.

**ABS Consulting provides this emergency service to PPL ONLY during normal working hours.** The SSES Project Manager's name, phone number and mailing address are as follows:

<p>ABS Consulting Mark Abrams</p> <p>(301) 907-9100 (301) 907-0050 (Fax)</p> <p>ABS Consulting Suite 620 East 7315 Wisconsin Avenue Bethesda, MD 20814</p>
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2. NATIONAL WEATHER SERVICE

The National Weather Service's (NWS) primary meteorological support responsibility for a radiological emergency at SSES resides with the NWS office at Binghamton, New York. In the event the Binghamton office is unable to provide this support, the designated backup is the NWS office in State College, Pennsylvania.

The role of the local NWS office is to provide weather information and forecasts in support of emergency response activities at SSES. The NWS can be consulted over the telephone if data interpretations, assessment, or forecasting assistance are needed.

This information will include the following:

- Forecasts at current time and 6 hours of:
  - a. 10-meter and 60-meter wind speed and wind direction,
  - b. Precipitation rate in inches per 15 minutes, and,
  - c. Boundary layer atmospheric stability described as **STABLE, UNSTABLE, or NEUTRAL.**
- Estimates of current 10-meter and 60-meter wind speed and wind direction in the event of complete loss of onsite and offsite meteorological instrumentation.
- General weather forecast from current time to 48 hours with special emphasis on significant weather occurrences such as major changes in wind speed, wind direction or synoptic weather patterns.
- Periodic weather updates at time intervals dictated by the on-going weather and emergency situation.

**NOTE: The NWS should ONLY be contacted when meteorological support from ABS Consulting is not available (i.e., weekends, holidays, and during the overnight hours).**

Whenever contacting the NWS, be sure to provide the following information:

- Name, Title, Facility, and Location
- Reason for the call
- Status of the Emergency
- Return telephone number

**The following telephone numbers are UNLISTED and should only be used for EMERGENCY situations.**

**PRIMARY CONTACT  
NWS EMERGENCY METEOROLOGICAL SUPPORT OFFICE**

National Weather Service Office  
Binghamton Regional Airport  
32 Dawes Drive  
Johnson City, NY 13795

(607) 798-6625  
(607) 729-7629  
(607) 798-6624 (Fax)

**BACKUP CONTACT  
NWS EMERGENCY METEOROLOGICAL SUPPORT OFFICE**

National Weather Service Office  
227 W. Beaver Avenue, Suite 402  
State College, PA 16801

(814) 237-1152  
(814) 237-1153  
(814) 234-9703 (Fax)

## PLANT COMPUTER METEOROLOGICAL DATA POINT IDENTIFIERS

METEOROLOGICAL PARAMETER	POINT ID*	UNITS	AVERAGING PERIOD
<b>PRIMARY TOWER - east of the plant, 300' high red/white tower.</b>			
10m Wind Direction	vma03	degrees	15 minutes
10m Wind Speed	vma06	mph	15 minutes
Delta T "A"	vma01	°C/50m	15 minutes
Delta T "B"	vma02	°C/50m	15 minutes
60m Wind Direction	vma04	degrees	15 minutes
60m Wind Speed	vma07	mph	15 minutes
10m Sigma Theta	vma10	degrees	15 minutes
60m Sigma Theta	vmx24	degrees	15 minutes
Precipitation Rate	vma09	in/hr	15 minutes
Ambient Temperature	vmt08b	°F	1 hour
<b>BACKUP TOWER - across from the SSES Learning Center.</b>			
10m Wind Direction	vma05	degrees	15 minutes
10m Wind Speed	vma08	mph	15 minutes
10m Sigma Theta	vma12	degrees	15 minutes
<b>DOWNRIVER TOWER - on Route 93 just east of Nescopeck.</b>			
10m Wind Direction	vmx09b	degrees	2 minutes**
10m Wind Speed	vms05b	mph	2 minutes**
10m Sigma Theta	vmx10b	degrees	2 minutes**

\* Letters are given here in lower case to differentiate the letter o from the number 0.

**SUPPLEMENTARY METEOROLOGICAL INFORMATION TABLES**

**TABLE 1**

<b>ATMOSPHERIC STABILITY CLASSIFICATION</b>					
<b>Stability Class</b>		<b>Delta</b>	<b>(Alternate)</b>	<b>Plume Width</b>	<b>% of Hrs at SSES</b>
<b>Code</b>	<b>Title</b>	<b>Temperature (°C/50m)</b>	<b>Sigma Theta (degrees)</b>	<b>@ 10 miles (miles)</b>	
A	Very Unstable	≤-.95	≥22.5	5.7	6
B	Unstable	-.94 to -.85	17.5 to 22.4	4.3	3
C	Slightly Unstable	-.84 to -.75	12.5 to 17.4	3.3	4
D	Neutral	-.74 to -.25	7.5 to 12.4	2.3	35
E	Slightly Stable	-.24 to .75	3.8 to 7.4	1.6	32
F	Stable	.76 to 2.0	2.1 to 3.7	1.1	12
G	Very Stable	>2.0	<2.1	.75	8

**TABLE 2**

**DAYTIME**

(08:00 to 18:00)

<b>Initial Stability Class/ Wind Speed (MPH)</b>	<b>FINAL VALUE</b>
<b>A</b>	
Wind Speed < 7	A
7 ≤ Wind Speed < 9	B
9 ≤ Wind Speed < 13	C
Wind Speed ≥ 13	D
<b>B</b>	
9 < Wind Speed	B
9 ≤ Wind Speed < 13	C
Wind Speed ≥ 13	D
<b>C</b>	
13 < Wind Speed	C
Wind Speed ≥ 13	D
<b>D, E, F, G</b>	
Any wind speed.	D

**TABLE 3**

**NIGHTTIME**

(18:00 to 08:00)

<b>Initial Stability Class/ Wind Speed (MPH)</b>	<b>FINAL VALUE</b>
<b>A</b>	
6 < Wind Speed	F
6 ≤ Wind Speed < 8	E
Wind Speed ≥ 8	D
<b>B</b>	
5 < Wind Speed	F
5 ≤ Wind Speed < 7	E
Wind Speed ≥ 7	D
<b>C</b>	
5 < Wind Speed	E
Wind Speed ≥ 5	D
<b>D</b>	
Any wind speed.	D
<b>E</b>	
11 < Wind Speed	E
Wind Speed ≥ 11	D
<b>F,G</b>	
7 < Wind Speed	F
7 ≤ Wind Speed < 11	E
Wind Speed ≥ 11	D

Example: If wind speed is 9 mph and sigma theta is 18 degrees @ 10 a.m., the initial stability class from Table 1 is "B" and the wind speed corrected stability class from Table 2 is "C".

**TABLE 4**

<b>WIND SECTORS AND DISTANCES</b>						
<b>Wind From</b>		<b>Affected Sector</b>	<b>Affected EPB* Distance (mi)</b>	<b>On-Site Team Distance (mi)</b>	<b>Site Boundary Distance (mi)</b>	<b>% of Hrs Sector Affected SSES</b>
<b>Degrees</b>	<b>Sector</b>					
348 - 11	N	S	0.34	0.25	0.38	6
12 - 33	NNE	SSW	0.34	0.37	0.39	9
34 - 56	NE	SW	0.34	0.33	0.61	12
57 - 78	ENE	WSW	0.34	0.39	1.22	11
79 - 101	E	W	0.34	0.37	1.03	6
102 - 123	ESE	WNW	0.34	0.41	0.61	4
124 - 146	SE	NW	0.34	0.35	0.66	4
147 - 168	SSE	NNW	0.34	0.29	0.59	4
169 - 191	S	N	0.34	0.29	0.59	5
192 - 213	SSW	NNE	0.34	0.39	0.78	7
214 - 236	SW	NE	0.34	0.42	0.58	11
237 - 258	WSW	ENE	0.34	0.52	0.49	7
259 - 281	W	E	0.34	0.45	0.48	4
282 - 303	WNW	ESE	0.34	0.18	0.50	3
304 - 326	NW	SE	0.34	0.20	0.43	3
326 - 348	NNW	SSE	0.34	0.20	0.41	5

\* EPB distances established at Exclusion Area Boundary distance of 1800 ft.