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249 - 249 - EOF DOSE CALCULATOR

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CATEGORY: PROCEDURES TYPE: EP
ID: EP-PS-249
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A045

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) At the command line, type GD_VMS05B and [ENTER] for Downriver Tower wind speed.

      2) At the command line, type GD_VMX09B and [ENTER] for Downriver Tower wind direction.

      3) At the command line, type GD_VMX10B and [ENTER] for Downriver Tower sigma theta.

      4) Press Escape [ESC] to return to the SSES Logo display.

   d. Other options – see Step 6 below.

3. If the Primary Met Tower ΔT 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:

YELLOW:	**DATA ACCEPTABLE**
RED:	**DATA EXCEEDS WARNING LIMIT**
MAGENTA:	**DATA EXCEEDS ALARM SETPOINT**
WHITE:	**DATA SUSPECT**

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 the 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. Click on OK.

   e. Group point display will return with values for the specified retrieval time.

   f. Press the **[F4]** key to step through data points from the specified retrieval time to the current time.

      NOTE: Not all desired data is likely to be available for any one particular point in time.

g. 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.)

h. 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:

ABS Consulting Mark Abrams (301) 907-9100 (301) 921-2362 (Fax) ABS Consulting Suite 200 4 Research Place Rockville, MD 20850

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
PRIMARY TOWER - east of the plant, 300' high red/white tower.			
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
BACKUP TOWER - across from the SSES Learning Center.			
10m Wind Direction	vma05	degrees	15 minutes
10m Wind Speed	vma08	mph	15 minutes
10m Sigma Theta	vma12	degrees	15 minutes
DOWNRIVER TOWER - on Route 93 just east of Nescopeck.			
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

ATMOSPHERIC STABILITY CLASSIFICATION					
Stability Class		Delta Temperature (°C/50m)	(Alternate) Sigma Theta (degrees)	Plume Width @ 10 miles (miles)	% of Hrs at SSES
Code	Title				
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)

Initial Stability Class/ Wind Speed (MPH)	FINAL VALUE
A	
Wind Speed < 7	A
7 ≤Wind Speed < 9	B
9 ≤ Wind Speed < 13	C
Wind Speed ≥ 13	D
B	
Wind Speed < 9	B
9 ≤ Wind Speed < 13	C
Wind Speed ≥ 13	D
C	
Wind Speed < 13	C
Wind Speed ≥ 13	D
D, E, F, G	
Any wind speed.	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 3

NIGHTTIME
(18:00 to 08:00)

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

TABLE 4

WIND SECTORS AND DISTANCES						
Wind From		Affected	Affected EPB*	On-Site Team	Site Boundary	% of Hrs Sector
Degrees	Sector	Sector	Distance (mi)	Distance (mi)	Distance (mi)	Affected SSES
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.

MIDAS OPERATING PROCEDURE

TABLE OF CONTENTS

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., <u>LOGIN</u>) 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 on a DOS computer:

   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. Select the appropriate calculation option and **CONFIRM** your selection.

5. To exit MIDAS on a DOS computer, double-click **EXIT** on each menu screen that appears. At the **SECURITY MENU**, press [F8] to log off.

6. To start MIDAS on a Windows computer:

   a. Turn on each component (monitor, computer, and printer) of the computer system on which MIDAS is loaded.

   b. At the WINDOWS LOGIN Screen, press **[CANCEL]**.

   c. On the System Desktop, double click on the MIDAS Icon.

   d. The system will then display the **CURRENT DATE**. If the date is correct, press **[ENTER]**. If the 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 date is correct, press **[ENTER]**. If the date 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 a short time.

   g. The **ACCIDENT MENU SELECTION** screen will appear. Select the appropriate calculation option and **CONFIRM** your selection.

7. To exit MIDAS on a Windows computer, double-clock **EXIT** on each menu screen that appears until you return to the System Desktop.

   a. On the System Desktop, select **START, SHUTDOWN, SHUTDOWN THE COMPUTER,** and press **[YES]**.

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
  (if available from Chemistry or as directed by RPC/DASU)
- SITE TOTAL PARTICULATE RELEASE RATES
  (if available from Chemistry or as directed by RPC/DASU)

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**.

      NOTE: **CURRENT SCENARIO EDIT** will include releases/doses from previous time steps, if applicable.

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

If the primary meteorological tower wind speed remains at "zero" during freezing and/or other inclement weather, that data point is likely invalid, and the backup tower wind speed should be used if available.

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 ΔT 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:

NO PRECIPITATION	**0(zero)**
DRIZZLE or MIST	**LIGHT**
STEADY RAIN	**MEDIUM**
HEAVY DOWNPOUR	**HEAVY**

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 current vent data. 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 µCi/min.

   b. In the column labeled **TOT I-131 RELEASE**, enter the site total I-131 release rate in µCi/min. Unless valid data is available from Chemistry or data is authorized for use by the RPC/DASU, the I-131 release rate should be calculated as follows:

      TOT NG RELEASE (µCi/min)/1000 = TOT I-131 RELEASE (µCi/min)

   c. In the column labeled **TOT P RELEASE**, enter the site total particulate release rate in µCi/min. Unless valid data is available from Chemistry or data is authorized for use by the RPC/DASU, the particulate release rate should be calculated as follows:

      TOT NG RELEASE (µCi/min)/10,000 = TOT P RELEASE (µCi/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. Obtain Reactor Power from Engineering, Operations, or as follows:

      1) From PICSY, select Unit #1 or Unit #2 formats to view affected unit.

      2) Type STA and press **[ENTER]**.

      3) "Reactor Power" is in the top left section.

      4) Click on **MET VENT** to return to the Met/Vent data display.

   b. If the reactor is operating at or greater than 10% power, select the **ATWS** source term.

   c. If reactor power is at less than 10%, select the **LOCA (Clad Failure)** source term.

   d. 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.** Using the calendar wheel, enter the appropriate date and time of the start of release. **CONFIRM** to close the calendar wheel.

1) If **START NEW SCENARIO** was selected, the **START OF RELEASE** date/time entered should be the current date/time at which you are starting the calculation.

2) If **CURRENT SCENARIO EDIT** was selected, the previously entered **START OF RELEASE** should still be used, if met/vent date have been entered for each 15-minute period since that **START OF RELEASE.** Otherwise, select **RESET** until **START NEW SCENARIO** is selected.

NOTE: The **START OF RELEASE** is defined as the date and time of the first vent data entry.

c. On Line 3, select **REMAINING DURATION** of the release. 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 **PPL SUMMARY DATA SELECTION** screen allows the user to select different options for the **MIDAS DOSE ASSESSMENT SUMMARY SHEET**.

   a. Select the projection time from the left-hand column if other than the default of six hours is needed.

      NOTE: The 0.25-hour projection time should be used with extreme caution. Projected doses can be substantially underestimated.

   b. Select the **PEAK SECTOR** dose rate option; 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 alternate selection **(CURRENT AFFECTED SECTOR)** is applicable only when estimated dose rates from the current release period alone are requested by the RPC/DASU.

8. After the calculations have completed, the **MIDAS DOSE ASSESSMENT SUMMARY SHEET** will be displayed on the screen.

   a. If you want to select a different projection time or sector designation from the **PPL 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 SCRN]**.

      NOTE: If a hard-copy printout is made of the **MIDAS DOSE ASSESSMENT SUMMARY SHEET**, be sure to fill in the required information documenting the name of the dose calculator and approver.

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, INCLUDING PERCENT OF CLAD FAILURE OR FUEL MELT
- 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.

   - NOTE: Event tree menu selections, which include a definition of plant release parameters, are included (Section I) for each NUREG-1228 accident release scenario.

   b. Using information provided by Engineering Support, select percent clad failure or percent fuel melt as follows:

      (1) Left-click on percent clad failure (fuel melt).

      (2) Using the numpad on the screen, input the percent clad failure (fuel melt) provided by Engineering Support, the EN (ENTER).

      (3) **CONFIRM** your entry if correct. If incorrect, re-perform steps (1) and (2).

   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.**

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

      If the primary meteorological tower wind speed remains at "zero" during freezing and/or other inclement weather, that data point is likely invalid, and the backup tower wind speed should be used if available.

   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 ΔT 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:

NO PRECIPITATION	**0(zero)**
DRIZZLE or MIST	**LIGHT**
STEADY RAIN	**MEDIUM**
HEAVY DOWNPOUR	**HEAVY**

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 **PPL SUMMARY DATA SELECTION** screen allows the user to select different options for the **MIDAS DOSE ASSESSMENT SUMMARY SHEET.**

   a. Select the projection time from the left-hand column if other than the default of six hours is needed.

      NOTE: The 1-hour projection time should be used with caution. Projected doses can be underestimated.

   b. Select the **PEAK SECTOR** dose rate option; 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 alternate selection (**CURRENT AFFECTED SECTOR**) is applicable only when estimated dose rates from the current release period alone are requested by the RPC/DASU.

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

   a. If you want to select a different projection time or sector designation from the **PPL 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 SCRN]**.

NOTE (1): If a hard-copy printout is made of the **MIDAS DOSE ASSESSMENT SUMMARY SHEET**, be sure to fill in the required information documenting the name of the dose calculator and approver.

NOTE (2): Engineering Support or Operations concurrence with the selections may be documented by their representatives' signatures on the printout.

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

      If the primary meteorological tower wind speed remains at "zero" during freezing and/or other inclement weather, that data point is likely invalid, and the backup tower wind speed should be used if available.

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 ΔT 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:

NO PRECIPITATION	**0(zero)**
DRIZZLE or MIST	**LIGHT**
STEADY RAIN	**MEDIUM**
HEAVY DOWNPOUR	**HEAVY**

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 **PPL SUMMARY DATA SELECTION** screen allows the user to select different options for the **MIDAS DOSE ASSESSMENT SUMMARY SHEET**.

   a. Select the projection time from the left-hand column if other than the default of six hours is needed.

      NOTE: The 1-hour projection time should be used with caution. Projected doses can be underestimated.

   b. Select the **PEAK SECTOR** dose rate option; 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 alternate selection (**CURRENT AFFECTED SECTOR**) is applicable only when estimated dose rates from the current release-period alone are requested by the RPC/DASU.

7. After the calculations have completed, the **MIDAS DOSE ASSESSMENT SUMMARY SHEET** will be displayed on the screen.

   a. If you want to select a different projection time or sector designation from the **PPL 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 SCRN]**.

      NOTE: If a hard-copy printout is made of the **MIDAS DOSE ASSESSMENT SUMMARY SHEET**, be sure to fill in the required information documenting the name of the dose calculator and approver.

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, IODINE CONCENTRATION µCi/cc, 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: If the primary meteorological tower data is not available, refer to the Met Vent Data Acquisition Options tab for other options.

If the primary meteorological tower wind speed remains at "zero" during freezing and/or other inclement weather, that data point is likely invalid, and the backup tower wind speed should be used if available.

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 ΔT 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:

NO PRECIPITATION	**0(zero)**
DRIZZLE or MIST	**LIGHT**
STEADY RAIN	**MEDIUM**
HEAVY DOWNPOUR	**HEAVY**

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**.

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

   a. Obtain Reactor Power from Engineering, Operations, or as follows:

      1) From PICSY, select Unit #1 or Unit #2 formats to view affected unit.

      2) Type STA and press **[ENTER]**.

      3) "Reactor Power" is in the top left section.

      4) Click on **MET VENT** to return to the Met/Vent data display.

   b. If the reactor is operating at or greater than 10% power, select the **ATWS** source term.

   c. If reactor power is at less than 10%, select the **LOCA (Clad Failure)** source term.

   d. If conditions indicate a fuel handling incident and a release from the refueling floor (Reactor Building floor 818'), select **Fuel Handling Accident**.

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. Enter Field Team or ERMS Fixed Monitor gamma (EDE) dose rate whichever is appropriate.

   b. Enter the distance of the Field Team or Fixed Monitor from the plant as noted on the RMS Report or for the on-site team as noted on Table 4 of EP-AD-000-124.

   c. If iodine air sample data is available, enter either the **IODINE CARTRIDGE** reading in net counts per minute or an **IODINE CONCENTRATION** value in µCi/cc. A zero (0) value may be entered for the net count per minute or µCi/cc measurement, ~~if~~ indicated.

   d. If iodine data is not available, select the **DEFAULT MIX** option to characterize the iodine source term.

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 **PPL SUMMARY DATA SELECTION** screen allows the user to select different options for the **MIDAS DOSE ASSESSMENT SUMMARY SHEET**.

   a. Select the projection time from the left-hand column if other than the default of six hours is needed.

      NOTE: The 1-hour projection time should be used with caution. Projected doses can be underestimated.

   b. Select the **PEAK SECTOR** dose rate option; 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 alternate selection **(CURRENT AFFECTED SECTOR)** is applicable only when estimated dose rates from the current release period alone are requested by the RPC/DASU.

8. After the calculations have completed, the **MIDAS DOSE ASSESSMENT SUMMARY SHEET** will be displayed on the screen.

   a. If you want to select a different projection time or sector designation from the **PPL 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 SCRN]**.

      NOTE: If a hard-copy printout is made of the **MIDAS DOSE ASSESSMENT SUMMARY SHEET**, be sure to fill in the required information documenting the name of the dose calculator and approver.

   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 ASSESSMENT SUMMARY SHEET** 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. MENU G: BLOWOUT PANEL CALCULATIONS

REQUIRED INPUTS

ENGINEERING OR OPERATIONS SUPPORT IS REQUESTED FOR THESE CALCULATIONS.

PLANT CONDITIONS

- TIME OF REACTOR SHUTDOWN
- RELEASE START TIME
- PROJECTION TIME
- BLOWOUT PANEL ASSUMED TO HAVE LIFTED (RELEASE PATHWAY)
- CORE CONDITION, INCLUDING PERCENT OF CLAD FAILURE OR CORE MELT

MET DATA

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

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 the existing met spreadsheet file, select **CURRENT SCENARIO EDIT** and **CONFIRM.**

      NOTE: **CURRENT SCENARIO EDIT** will include releases/doses from previous time steps, if applicable.

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

If the primary meteorological tower wind speed remains at "zero" during freezing and/or other inclement weather, that data point is likely invalid, and the backup tower wind speed should be used if available.

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 ΔT 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:

NO PRECIPITATION	**0(zero)**
DRIZZLE or MIST	**LIGHT**
STEADY RAIN	**MEDIUM**
HEAVY DOWNPOUR	**HEAVY**

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

3. The **BLOWOUT PANEL SELECTION** screen will appear.

NOTE: Blowout panel locations are shown on Figure 1 of this procedure tab.

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. **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.

c. On the **PERCENT CLAD FAILURE** (or **PERCENT FUEL MELT**) screen, using information provided by Engineering Support, select percent clad failure or percent fuel melt as follows:

(1) Left-click on percent clad failure (fuel melt).

(2) Using the numpad on the screen, input the percent clad failure (fuel melt) provided by Engineering Support, then EN (ENTER).

(3) CONFIRM your entry if correct. If incorrect, re-perform steps (1) and (2).

NOTE: Release rates used by MIDAS are those shown in Table 1 of this procedure tab, multiplied by the percent clad failure (fuel melt) entered, expressed as a fraction (e.g., the multiplier for 50% fuel melt would be 0.5).

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

a. Missing information will be indicated by a black box (with white lettering) in the left-hand column.

(1) Left-click on the black box in the left column.

(2) Using the numpad on the screen, input the response to the missing data.

(3) Repeat steps (1) and (2) to supply any other required information.

(4) CONFIRM your entry if correct. If incorrect, re-perform steps (1) and (2) for the data in error.

5. The **PPL SUMMARY DATA SELECTION** screen allows the user to select different options for the **MIDAS DOSE ASSESSMENT SUMMARY SHEET**.

   a. Select the projection time from the left-hand column if other than the default of six hours is needed.

      NOTE: The 0.25-hour projection time should be used with extreme caution. Projected doses can be substantially underestimated.

   b. Select the **PEAK SECTOR** dose rate option; 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 alternate selection (**CURRENT AFFECTED SECTOR**) is applicable only when estimated dose rates from the current release period alone are requested by the RPC/DASU.

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

   a. If you want to select a different projection time or sector designation from the **PPL 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 SCRN]**.

      NOTE: If a hard-copy printout is made of the **MIDAS DOSE ASSESSMENT SUMMARY SHEET**, be sure to fill in the required information documenting the name of the dose calculator and approver.

FIGURE 1

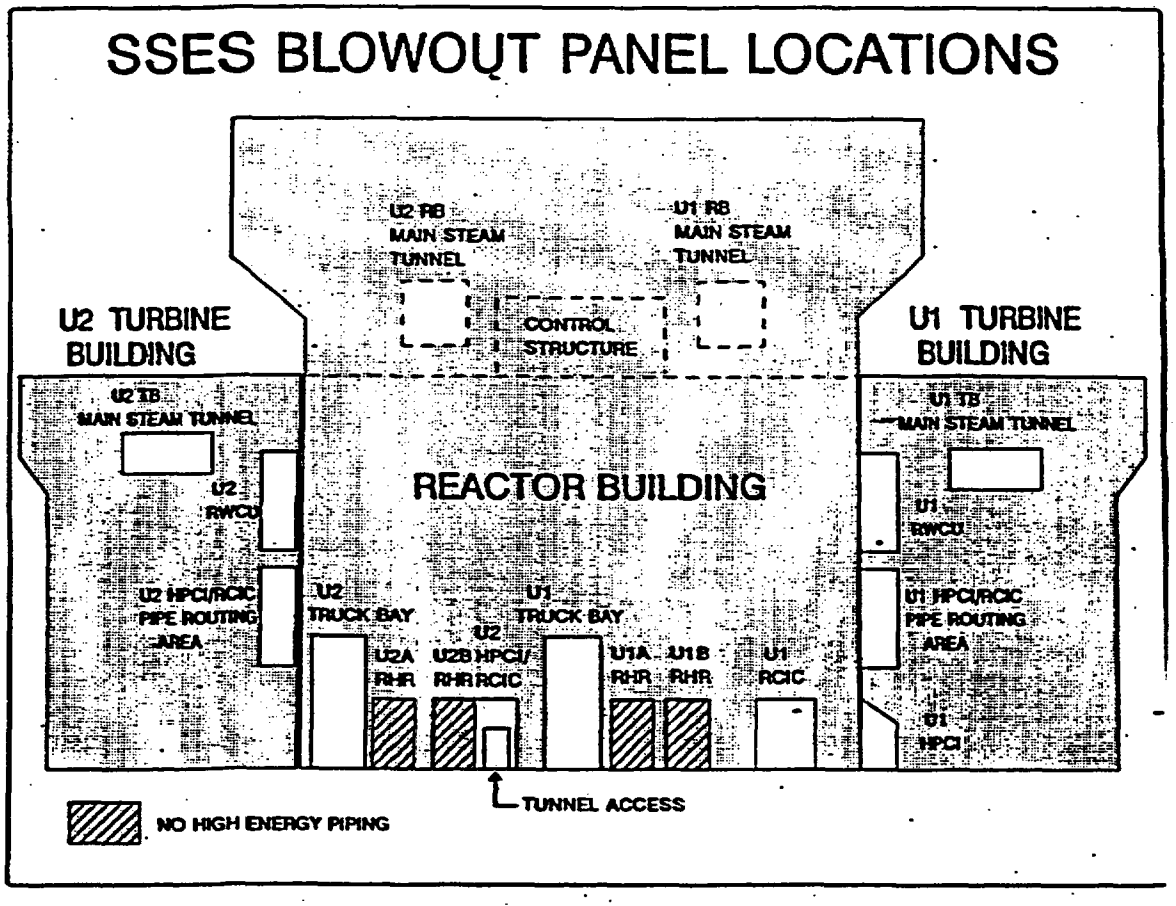
SSES BLOWOUT PANEL LOCATIONS
U2 RB MAIN STEAM TUNNEL
U1 RB MAIN STEAM TUNNEL
CONTROL STRUCTURE
U2 TURBINE BUILDING
U1 TURBINE BUILDING
U2 TB MAIN STEAM TUNNEL
U1 TB MAIN STEAM TUNNEL
REACTOR BUILDING
U2 RWCU
U1 RWCU
U2 HPCI/RCIC PIPE ROUTING AREA
U2 TRUCK BAY
U1 TRUCK BAY
U2 U2A RHR
U2B RHR
U2 HPCI/ RCIC
U1A RHR
U1B RHR
U1 RCIC
U1 HPCI/RCIC PIPE ROUTING AREA
U1 HPCI
TUNNEL ACCESS
NO HIGH ENERGY PIPING

TABLE 1
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	I-131	PARTICULATE
RCIC PUMP ROOM	(µCi/min)	(µCi/min)	(µCi/min)
[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
HPCI PUMP ROOM	(µCi/min)	(µCi/min)	(µCi/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
HPCI/RCIC ROUTING AREA	(µCi/min)	(µCi/min)	(µCi/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
RWCU PENETRATION ROOM	(µCi/min)	(µCi/min)	(µCi/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
RB/TB MAIN STEAM TUNNEL	(µCi/min)	(µCi/min)	(µCi/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 the TRM limit for noble gas release rate.
REFERENCE: EC-RADN-1018, Evaluation of Unmonitored Releases from Station Blowout Panels, Revision 1, File R2-1.

G. DESCRIPTION OF INFORMATION PROVIDED ON THE MIDAS DOSE ASSESSMENT SUMMARY SHEET

1. CALCULATION TYPE

Menu option chosen for the calculation. Examples are Forward Calculation or Event Tree Calculation.

2. CURRENT TIME PERIOD

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

3. WEATHER CONDITIONS

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

4. REACTOR SHUTDOWN TIME

Date and time of reactor shutdown.

5. RELEASE START TIME

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 calculation..

NOTE: For MENU C: EVENT TREE NUREG-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.

6. PROJECTION TIME

This is the time X hours into the future, starting from the beginning of the current meteorological time period. "X" is the number of hours the user chooses as the projection time (e.g., 6 hours).

7. REMAINING DURATION

This is the remaining duration of the release for the calculation type chosen. For Event Tree calculations, that is always 24 hours and for Blowout Panel calculations, 0.25 hours.

8. **SOURCE TERM (for Forward and Back Calculations)**

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

9. **RELEASE CONDITIONS**

This section lists the release rates used in the calculation. The values are taken from user input for Forward calculations, inferred from user input of event conditions (Event Tree, Default, and Blowout Panel calculations, or inferred from user input of measured data in the field (Back calculations).

10. Content of this section varies by Calculation Type. The objective is to provide information about the assumptions used to infer the Release Conditions for the calculation or to provide additional information about the Release Conditions.

For **Forward Calculations**, isotopic release ratios are provided. These may be compared to default ratios and used to infer plant conditions, for example, status of filtration.

For **Event Tree, Default,** and **Blowout Panel Calculations**, event or default conditions are listed. From those conditions, Release Conditions are inferred.

For **Back Calculations**, measured field data are listed. From those data, Release Conditions are inferred.

11. **DOSE RATE PROJECTIONS**

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 (the usual user selection).

12. INTEGRATED DOSE PROJECTIONS

This table provides a TEDE and THYROID CDE dose projection calculated at the EPB, 2-mile, and 10-mile distances for varying projection times. The projection time will appear in the header line e.g., 4 HOUR INTEGRATED DOSE PROJECTION. The sector designation for this dose projection is based on the maximum calculated dose determined from all sixteen sectors for the given projection time (peak sector option, usually the user's choice) or the calculated dose for the current affected sector. Information for distances between 10 and 50 miles is available using the "More Reports" feature.

13. PERFORMED/APPROVED

The sign-off for calculation results is done for documentation purposes. The intended "approval" 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 sign-off process should occur before the calculated results are used for any emergency classification determinations or protective action recommendations.

MIDAS DOSE ASSESSMENT SUMMARY SHEET

FORWARD Calculation

TIME: 15:00 DATE: 2/27/03

WEATHER CONDITIONS		REACTOR CONDITIONS	
WINDSPEED (mph):	3	RX SHUTDOWN TIME:	2/26/03 13:53
WIND FROM DIRECTION (deg):	10	RELEASE START TIME:	2/27/03 14:53
AFFECTED SECTOR:	S	PROJECTION TIME:	2/27/03 20:53
DELTA TMP (deg.c) (STAB):	1.3 (E)	REMAINING DURATION (HOURS):	6.00
PRECIPITATION:	NO	SOURCE TERM: LOCA (CLAD FAILURE)	

RELEASE CONDITIONS (uCi/min)		ISOTOPIC RELEASE RATIOS	
NG RELEASE RATE USED:	1.00E+08	NG/I-131 RATIO:	1.0E+03
I-131 RELEASE RATE USED:	1.00E+05	NG/PARTICULATE RATIO:	1.0E+04
PART. RELEASE RATE USED:	1.00E+04		

DOSE RATE PROJECTIONS (mrem/hr)		PEAK SECTOR	6.00 HOUR INTEGRATED DOSE PROJECTIONS (mrem)		PEAK SECTOR
TEDE AT OSCAR:	21.21	S	TEDE AT EPB:	130.58	S
TEDE AT EPB:	17.36	S	TEDE AT 2 MILE:	28.10	S
			TEDE AT 10 MILE:	0.11	SSE
THY CDE AT OSCAR:	622.05	S			
THY CDE AT EPB:	492.30	S	THY CDE AT EPB:	2.91E+03	S
			THY CDE AT 2 MILE:	471.30	S
EDE AT OSCAR:	6.78	S	THY CDE AT 10 MILE:	0.25	SSE
EDE AT EPB:	5.92	S			

PERFORMED BY: _____ APPROVED BY: _____

RESTART REPORT | CONTINUE

H. INFORMATION FOR DISTANCES BETWEEN 10 AND 50 MILES

1. From the **MIDAS DOSE ASSESSMENT SUMMARY SHEET** screen, select **CONTINUE** and, on the next page, **MORE REPORTS**.

2. Select **TEDE 4-DAY DOSE REPORT** or **THYROID CDE DOSE REPORT**, depending on which **PAR** guide has been exceeded at the 10-mile distance.

3. On the **REPORT PARAMETER SELECTION** screen, select **PROJECTION TIME** until the appropriate **PROJECTION TIME** (0.25, 4, 6, or 9 hours) is displayed on the screen; then select **CONFIRM**.

   NOTE: The 0.25-hour projection time should be used with extreme caution. Projected doses can be substantially underestimated.

4. The screen will now display projected doses at the **EPB** and at 2, 5, 10, 25, and 50 miles. To obtain finer increments of distance, select **CONTINUE** until the desired range of distances is displayed.

   NOTE: An objective is to determine the approximate distance from the plant at which dose projections are less than 1 rem **TEDE** and 5 rem **THYROID CDE**. A **PAR** is then likely to be issued to the next furthest 5-mile distance increment from the plant.

   Example: A **PAR** for distances to 30 miles may be selected if projected doses become less than the **PAG** values (1 rem **TEDE**, 5 rem **THYROID CDE**) between 25 and 30 miles from the plant.

I. ACCIDENT DESCRIPTIONS

DEFAULT ACCIDENT DESCRIPTIONS (MENU B AND MENU D)

1. NORMAL REACTOR COOLANT ACTIVITY

This accident scenario is defined as the release of reactor coolant system liquid and steam activity from the primary coolant system with no damage to the fuel and no activity spiking. The source term for this accident is normal reactor coolant system liquid and steam activity.

2. LOCA (RX DP-NO FD)

This accident scenario is defined as the release of reactor coolant system liquid and steam activity from the primary coolant system. Depressurization of the primary coolant system is assumed, resulting in an activity spike in the reactor coolant. The source term for this accident is normal reactor coolant liquid and steam activity plus the depressurization activity spike. There is no fuel damage.

3. LOCA (CLAD FAILURE)

This accident scenario is defined as a Loss-of-Coolant Accident which results in damage to the reactor fuel cladding. The source term for this accident is normal reactor coolant liquid and steam activity and a percentage of the activity in the fuel clad gap. For Menu D calculations, that percentage is entered as part of the calculation process. For Menu B calculations, the valid vent data entered define the severity of the event.

4. LOCA (FUEL MELT)

This accident scenario is defined as a Loss-of-Coolant Accident which results in damage to the reactor fuel. The source term for this accident is normal reactor coolant liquid and steam activity and a percentage of the activity in the reactor fuel. For Menu D calculations, that percentage is entered as part of the calculation process. For Menu B calculations, the valid vent data entered define the severity of the event.

5. FUEL HANDLING ACCIDENT

This accident scenario is defined as a fuel handling accident which results in the release of spent fuel activity. The source term for this accident is spent fuel gap activity assuming a decay time after shutdown of 24 hours.

6. **ATWS**

This accident scenario is used for releases from a reactor unit continuing to operate at or greater than 10% power. The source term for this accident is normal reactor coolant system liquid and steam activity. The source term is undecayed; that is, no reactor trip is assumed to have occurred.

NOTE (1): For Menu D calculations, design basis assumptions are utilized. For example, design basis leakage rates are assumed and iodine filtration efficiency of 99% is assumed in those pathways for which filters are in place.

NOTE (2): The source term for Menu D accident types is fixed. Release rate is calculated by MIDAS by dividing the total activity released by a predetermined release duration (6 hours for all but fuel handling accidents, for which release duration is 2 hours).

NUREG 1228 EVENT TREE ACCIDENT TYPES (MENU C)

1. **LOCA - DRYWELL RELEASE**

This accident is a Loss-of-Coolant Accident with an activity release into the drywell which bypasses the suppression pool for which filtration of activity by the Standby Gas Treatment System takes place before release to the environment.

2. **LOCA - WETWELL RELEASE**

This accident is a Loss-of-Coolant Accident with an activity release through the suppression pool for which filtration of activity by the Standby Gas Treatment System takes place before release to the environment.

3. **LOCA - CONTAINMENT BYPASS RELEASE**

This accident is a Loss-of-Coolant Accident with an activity release to the environment that bypasses the containment and the Standby Gas Treatment System.

4. **ZIRCALLOY FIRE IN ONE THREE MONTH OLD BATCH**

This accident is a zircalloy fire in spent fuel that results in an activity release similar to a core melt. It assumes that the activity is filtered by the Standby Gas Treatment System prior to release.

5. SPENT FUEL GAP RELEASE

This accident is a release of fuel gap activity from the spent fuel pool with treatment by the Standby Gas Treatment System prior to release.

NOTE: Menu C (from NUREG-1228 Event Tree Analyses) is used to relatively quickly provide a bounding estimate of offsite dose, for situations where there are substantial uncertainties in prediction of source term and any resultant doses.

NUREG 1228 MENU STRUCTURE FOR DRYWELL RELEASE

DRYWELL RELEASE	WETWELL RELEASE	CONTAINMENT BYPASS RELEASE	SPENT FUEL POOL RELEASE
(Clad Failure) GAP RELEASE UNCOVERED 15-30 MIN	(Fuel Melt) IN-VESSEL SEVERE DAMAGE UNCOVERED > 30 MIN	(Fuel Melt) VESSEL MELT THROUGH	Core Condition
SPRAY ON	SPRAY OFF		Status of Drywell Containment Spray
HOLDUP TIME <1 HOUR CATASTROPHIC CONTAINMENT FAILURE	HOLDUP TIME 2-12 HOURS (DEFAULT)	HOLDUP TIME 24 HOURS DELAYED RELEASE	Drywell Holdup Time: Time from Release into Containment to Start of Release into Environment[1]

LEAK RATE 100%/HOUR	LEAK RATE 100%/DAY UNFILTERED	LEAK RATE 100%/DAY FILTERED	DESIGN LEAK RATE UNFILTERED	DESIGN LEAK RATE FILTERED
Catastrophic Containment Failure	Failure to Isolate Containment			1%/Day

(1) HOLDUP TIME is defined as drywell holdup time prior to release to the environment. During this time period, credit is taken for drywell airborne activity removal due to plateout by natural processes and water sprays prior to release to the environment.

NUREG 1228 MENU STRUCTURE FOR WETWELL RELEASE

DRYWELL RELEASE	WETWELL RELEASE	CONTAINMENT BYPASS RELEASE	SPENT FUEL POOL RELEASE
(Clad Failure) GAP RELEASE UNCOVERED 15-30 MIN	(Fuel Melt) IN-VESSEL SEVERE DAMAGE UNCOVERED > 30 MIN	(Fuel Melt) VESSEL MELT THROUGH	Core Condition
SATURATED	SUB-COOLED		Conditions in Suppression Pool
HOLDUP TIME <1 HOUR CATASTROPHIC CONTAINMENT FAILURE	HOLDUP TIME 2-12 HOURS (DEFAULT)	HOLDUP TIME 24 HOURS DELAYED RELEASE	Wetwell Holdup Time: Time from Release into Wetwell to Start of Release into Environment[1]

LEAK RATE 100%/HOUR	LEAK RATE 100%/DAY UNFILTERED	LEAK RATE 100%/DAY FILTERED	DESIGN LEAK RATE UNFILTERED	DESIGN LEAK RATE FILTERED
Catastrophic Containment Failure	Failure to Isolate Containment			1%/Day

(1) HOLDUP TIME is defined as wetwell holdup time prior to release to the environment. During this time period, credit is taken for wetwell airborne activity removal due to plateout by natural processes and water sprays prior to release to the environment.

NUREG 1228 MENU STRUCTURE FOR CONTAINMENT BYPASS RELEASE

DRYWELL RELEASE	WETWELL RELEASE	CONTAINMENT BYPASS RELEASE	SPENT FUEL POOL RELEASE
(Clad Failure) GAP RELEASE UNCOVERED 15-30 MIN	(Fuel Melt) IN-VESSEL SEVERE DAMAGE UNCOVERED > 30 MIN	(Fuel Melt) VESSEL MELT THROUGH	Core Condition
UNFILTERED	FILTERED		Is Release Filtered?
RELEASE RATE 100%/HOUR	RELEASE RATE 100%/DAY	TYPICAL DESIGN RELEASE RATE	Release Rate, in Terms of Percent of Core Inventory
Catastrophic Containment Failure	Failure to Isolate Containment	1%/Day	

NUREG 1228 MENU STRUCTURE FOR SPENT FUEL POOL RELEASE

DRYWELL RELEASE	WETWELL RELEASE	CONTAINMENT BYPASS RELEASE	SPENT FUEL POOL RELEASE
ZIRCALLOY FIRE IN ONE 3 MONTH OLD BATCH	GAP RELEASE FROM ONE 3 MONTH OLD BATCH	GAP RELEASE FROM 15 BATCHES (TOTAL POOL)	Condition of Spent Fuel
SPRAY ON	SPRAY OFF (Default)		Status of Containment Spray into Pool
HOLDUP TIME <1 HOUR CATASTROPHIC FAILURE OF REACTOR BUILDING	HOLDUP TIME 2-12 HOURS (DEFAULT)		Time from Release from Fuel to Start of Release into Environment[1]
LEAK RATE 100%/HOUR	LEAK RATE 100%/DAY UNFILTERED	LEAK RATE 100%/DAY FILTERED	Release Rate, in Terms of Percent of Source Inventory

Catastrophic Failure of Secondary Containment

(1) HOLDUP TIME for a spent fuel pool release is defined as reactor building holdup time prior to release to the environment. During this time period, credit is taken for reactor building airborne activity removal due to plateout by natural processes and water sprays prior to release to the environment.

PICSY VENT RELEASE RATES GUIDELINES

SITE TOTAL RELEASE RATES

µCi/min

	RELEASE	UNUSUAL EVENT	ALERT
EAL Reference:	N/A as read in PICSY	15.1 for 60 min	15.2 as read in PICSY
NOBLE GAS:	Any noticeable increase above pre-event values	2.00E+6	2.00E+8

IDENTIFICATION OF RELEASE IN PROGRESS

There is a radiological release in progress if ANY of the following are true:

1.0 Any release rates above Technical Specifications or Technical Requirements Manual limits, OR

2.0 Entry into the Emergency Plan for the listed EALs:

- 3.0 Fuel Clad Degradation
- 15.0 Radiological Effluents
- 17.0 Spent Fuel Related Incident
- 18.0 Steam Line Break
- 21 Dry Fuel Storage, AND the DSC has been breached, OR

3.0 The Shift Manager/ED/RM has reason to believe that an unmonitored release is in progress even though plant indications are otherwise normal, OR

4.0 Initiation of the Standby Gas Treatment System for treatment of activity within containment, OR

5.0 Any radiological release above normal levels to the environment, detected by effluent monitors

5.1 or environmental monitoring,

5.2 and attributable to a declared event.

5.3 Normal levels are the highest reading in the last 24 hours prior to the emergency, excluding the current peak value. The Dose Assessment Staff is not required to determine this quantitatively. Dose Assessment Staff should identify a release in progress if:

- release rates are visibly higher than known data prior to the start of the event, OR
- information is received from Operations that release rates are above normal levels and are attributable to a declared event.

5.4 Field monitoring readings above instrument lower limits of detection or RMS readings yielding unanticipated alarms.