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247 - 247 - FIELD TEAM DIRECTOR

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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) 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 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 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:

ABS Consulting Mark Abrams (301) 907-9100 (301) 907-0050 (Fax) ABS Consulting Suite 620 East 7315 Wisconsin Avenue Bethesda, MD 20814
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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
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	
9 < Wind Speed	B
9 ≤ Wind Speed < 13	C
Wind Speed ≥ 13	D
C	
13 < Wind Speed	C
Wind Speed ≥ 13	D
D, E, F, G	
Any wind speed.	D

TABLE 3

NIGHTTIME

(18:00 to 08:00)

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

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

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)⁽¹⁾ dose shall not exceed 10 Rem.
 - 1.1.2 Dose to any organ (CDE)⁽²⁾, including the skin and extremity (SDE)⁽³⁾, shall not exceed 100 Rem.
 - 1.1.3 Dose to the lens of the eye shall not exceed 30 Rem (LDE)⁽⁴⁾.
- 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)⁽¹⁾ doses shall not exceed 25 Rem.
 - 1.2.2 Planned dose to any organ (CDE)⁽²⁾, 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)⁽⁴⁾.
- 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)⁽²⁾, 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)⁽²⁾, 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)⁽²⁾ 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
PROTECTIVE ACTION RECOMMENDATION (PAR) GUIDE
(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)⁽¹⁾ 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^(a)

Whole Body Absorbed Dose (rad)	Early Fatalities ^b (percent)	Whole Body Absorbed Dose (rad)	Prodromal Effects ^c (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.