:,print 103
:,end

CONTROLLED

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EP-IP-102-4	Control Room and Technical Support Center Hotlines to State and Local Agencies	0	1/20/83
EP-IP-102-5	Control Room and Technical Support Center Hotlines to the Nuclear Regulatory Commission	0	DELETED
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PROCEDURE COVER SHEET

PENNSYLVANIA POWER & LIGHT CO. SUSQUEHANNA STEAM ELECTRIC STATION	
EMERGENCY OFF-SITE DOSE CALCULATIONS	EP-IP-009 Revision 2 Page 1 of 64

Effective Date 10-14-83 Expiration Date 10-14-85

Revised Expiration Date _____

CONTROLLED

Prepared by D. L. Hagan Date 9/12/83

Reviewed by K E Shank Date 9/12/83

PORC Review Required Yes (X) No ( )

Approved by _____ Date 9/12/83
Section Head

PORC Meeting Number 83-211 Date 9-9-83

_____ Date 10-10-83
Superintendent of Plant

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ATTACHMENTS

EMERGENCY OFF-SITE DOSE CALCULATIONS

1.0 PURPOSE

This procedure provides the instructions for calculating whole body and thyroid radiation doses to the public during an emergency and for determining the noble gas and iodine releases using off-site monitoring measurements.

2.0 SCOPE

Instructions are provided for the DOSE Program, RADDOSE Program and the overlay-based manual calculations.

3.0 REFERENCES

3.1 NUREG 0654, Planning Standards and Evaluation Criteria for Emergency Preparedness, Nuclear Regulatory Commission

3.2 SSES Emergency Plan

3.3 Emergency Off-site Dose Calculation User's Manual, Dames and Moore

3.4 RADDOSE Technical Specifications

3.5 HMM Population Update for SSES Emergency Planning Zone

4.0 DEFINITIONS

4.1 CAM - Constant Air Monitor - used to denote SPING vent monitors in RADDOSE (see SPING).

4.2 Centerline - An imaginary line parallel to the wind direction bisecting the plume. At a given distance, the centerline dose is the maximum dose.

4.3 CRT - The Cathode Ray Tube serving as the DOSE and RADDOSE display screens.

4.4 Cursor - A small blinking white box on the CRT screen defining the location where the next character will be entered.

4.5 EOF - Emergency Operations Facility

4.6 EPB - Emergency Planning Boundary - corresponds to PP&L legal site boundary with the exception of sectors bordering on Route 11.

4.7 EPZ - Emergency Planning Zone

4.8 Execute - The point at which the RADDOSE program will interpret what has been entered.

4.9 Field - The location on the CRT screen where data inputs are accepted.

4.10 Integrated Dose - The total dose (mrem) delivered, from the inception of the release to the present time.

4.11 Metering Point - The UTM coordinate location where the field measurements were performed.

4.12 Met Tower Scan Source - Indicates the tower and scan height of the meterological input data.

4.13 Point Distance - A specific location for a dose calculation designated by its UTM coordinates.

4.14 Population Dose - The total dose (man-rem) which a population would receive if exposed to a specified dose rate for a specified period of time. It is calculated by multiplying the integrated dose (rem) for a specific location by the number of individuals (man) residing at that location.

4.15 Projected Dose - The total dose (mrem) which is expected to be delivered from the time the release started to some future time.

4.16 Sigma Theta ($\Sigma\Theta$) - The standard deviation of the horizontal wind direction used to determine atmospheric stability.

4.17 Site Boundary Monitoring Team Location - predesignated location in each sector where plant health physics personnel will perform boundary monitoring.

4.18 Source Term - The release of radioactive substances from SSES and identified in terms of noble gases, iodines and particulates.

4.19 SPING - Particulate, Iodine and Noble Gas monitor on the Susquehanna release vents which monitors releases of radioactive material.

4.20 Stability Class - Often referred to as Pasquill stability class, it is a measure of the dispersive characteristics of the atmosphere and denoted as (from least stable to most stable) A, B, C, D, E, F and G for SSES meterology. (Limited to C, D, E and G for overlays.)

4.21 Starting Point - The sector centerline distance (miles) which is input by the operator along with an "increment" and "endpoint" in order to effect dose calculations at multiple distances without specifically entering all distances.

4.22 Temperature Differential (ΔT) - The difference in Celcius temperature (°C) between 60m and 10m elevations on the primary meterological tower.

4.23 TSC - Technical Support Center

4.24 UTM Coordinate - Universal Transverse Mercator - One of a set of numbers used in specifying the location of a specific point obtained from USGS 10 mile EPZ map.

5.0 RESPONSIBILITIES

5.1 The EMERGENCY DIRECTOR has the responsibility to estimate doses to the population using the methods in this procedure and the monitoring data obtained from the actions specified in EP-IP-013, OFF-SITE EMERGENCY MONITORING TEAMS.

5.2 The RADIATION PROTECTION COORDINATOR shall assume the responsibility to estimate doses to the population from the EMERGENCY DIRECTOR when the Technical Support Center (TSC) assumes control of the emergency.

5.3 The EOF SUPPORT MANAGER shall assume responsibility for estimating does to the public from the RADIATION PROTECTION COORDINATOR until relieved by the RADIATION SUPPORT MANAGER when the EOF assumes control of offsite radiological functions.

5.4 The RADIATION SUPPORT MANAGER shall assume the responsibility for estimating doses to the public from the RADIATION PROTECTION COORDINATOR or the EOF SUPPORT MANAGER as appropriate.

5.5 The DOSE CALCULATORS are responsible for performing dose calculations at the direction of their responsible manager or coordinator in accordance with guidance given in this procedure.

6.0 INSTRUCTIONS

6.1 All persons performing OFF-SITE EMERGENCY DOSE CALCULATIONS should select the specific method according to the following table:

Priority	Method
1	DOSE
2	RADDOSE
3	Overlays

6.2 The overlay method should not be used to calculate doses at distances less than 1.5 miles from SSES, nor greater than 10 miles.

6.3 RADDOSE will only perform calculation for distances between 0.34 and 10 miles.

6.4 All persons performing dose calculations shall document the calculations on OFFSITE DOSE CALCULATION WORKSHEET (Attachment K, Page 61) or the BACKCALCULATION WORKSHEET (Attachment L, Page 62).

6.5 All persons performing off-site dose calculations are responsible for updating the Release Rate Trending board for Iodine and Noble Gas and listing the total curies released in the upper right-hand corner of each graph, (Attachment M, Page 63-64).

6.6 All persons performing off-site dose calculations are responsible for determining the total population dose (man-rem) as a result of the accident during the recovery phase or at the termination.

6.7 Dose calculators shall place appropriate Noble Gas overlay on SSES Emergency Planning Map to provide visualization of the plume dispersion. Place overlay with the plume isopleth origin over SSES on the intersection of the sector dividing lines. Orient the red arrow as instructed on the overlay.

6.8 Dose calculators shall provide the dose calculation worksheet for attachment to the Assessment Form (Form EP-IP-002-2) every 30 minutes.

6.9 Integrated doses shall be calculated on a sector by sector basis with the DOSE CALCULATOR maintaining previous affected sectors' integrated dose history. Projected doses shall only be calculated for the current affected sector. Integrated doses for the current affected sector only shall be used to calculate projected doses.

Check ( )

A.1.0 Computer/Keyboard Terminology for the DOSE and RADDOSE Programs.

_____ A.1.1 COMMON

a. All calculations responses are denoted with ". Do not type the quotes.

b. All computer displays or outputs are denoted with'.

c. Characters enclosed in angle brackets < >, state that the key containing these letters is to be pressed. Do not type the word contained in the brackets.

d. Either set of number keys on the keyboard may be used to enter numerical data.

e. To correct typographical errors press the arrow keys < ← > or < → > to get to the unwanted character and erase (using space bar) or write over. This only works before data has been stored (either by pressing <RETURN> or <SHIFT> and <EXEC>.

f. Numbers in scientific notation should be entered using a Keyboard "E" in the following format "5E-6" or "5E5".

g. Letter "O" may not be substituted for number zero on number Keypad.

_____ A.1.2 DOSE PROGRAM

a. All input from the operator is to be terminated by pressing the <RETURN> key.

b. Invalid entries will result in the repetition of the original prompt message.

Check ( )

c. To use the printer off line to advance the paper press the SEL button (SEL light should go out). L.F. button will advance paper line by line and T.O.F. will advance paper to the top of the form. Knob on right of printer will manually advance the printer.

d. To allow inputs to be corrected after <RETURN> has been entered without returning to the beginning, at the end of various sequence of input data, the program will ask 'IS EVERYTHING CORRECT? Y or N' Type a "Y" (Yes) response and program will continue. After a "Y" is entered no changes to that data can be made without exiting the program and beginning again. Type a "N" (No) response and program will return to first prompt in that data input sequence. Note all data in that sequence will need to be reentered.

e. DOSE will not accept numbers greater than 1E35.

f. DOSE program must be run with <CAPS> Key in the locked position.

A.1.3 RADDOSE PROGRAM

a. Data is input on a complete page basis by simultaneously depressing the <SHIFT> and <EXEC> keys.

b. All upper black keyboard control keys must be simultaneously pressed with the <SHIFT> key for function execution.

Check ( )

c. The calculators input will always appear in white when initially entered. If all data entries are valid, the data will change from white to yellow after the <SHIFT> and <EXEC> keys are pressed. Allow several seconds for data to be accepted prior to attempting other inputs. If the entries are invalid or the request cannot be completed, the data will change from white to red and an error will be displayed at the bottom of the screen. If screen is changed prior to data changing yellow, data will not be stored.

d. To clear all white data or repair damage to the set green screen displays use the <RESTR> key with the <SHIFT> key.

e. To clear screen entirely and get out of program press <SHIFT> and <CANCEL> simultaneously.

f. RADDOSE will not accept numbers less than 1E-9.

INSTRUCTIONS FOR DOSE

B.1.0 PROGRAM DESCRIPTION

The DOSE program provides for estimation of the whole body immersion and the iodine inhalation off-site doses due to release of radioactive material from Susquehanna SES. DOSE requires manual input by the calcuator of the meteorological conditions and the radioactive release rates.

The program uses a straight line Gaussian model for estimating the transport and diffusion characteristics of the plume. The program accounts for applicable terrain correction factors and wet disposition corrections due to precipitation. DOSE uses appropriate isotope mix based on type of accident with decay corrections for time since reactor shutdown, as applicable, and for plume transit time.

The DOSE program can provide estimated whole body and thyroid dose rates for off-centerline points and dose rates, integrated doses and projected doses for predesignated population centers. DOSE will also provide a running total of releases and an estimated plume arrival time. There is no distance restrictions in DOSE for dose calculations. DOSE calculates projected doses allowing for varying projected time intervals. In the event that a source term is unavailable or to verify release rates, actual field measurements of whole body dose rates or iodine concentrations may be used in the DOSE program to predict or verify the release source term. Using this information, the dose rates at other locations may be calculated.

Check ( )

B.2.0 DOSE SYSTEM START UP

_____ B.2.1 Insert disk in Drive 1, prior to turning the system on, with the oval cutout away from the dose calculator with label facing up. Red light on the drive should light for approximately 30-60 seconds.

NOTE: USE DISK MARKED "CONTROLLED".

_____ B.2.2 Ensure main power cord is plugged into wall socket and switch power strip box to on.

_____ B.2.3 PRINTER Turn rocker switch of the left side to the "on" or "1" position. SEL and POWER green lights should be lit. If SEL light is not on, press the SEL button.

_____ B.2.4 KEYBOARD and DISK DRIVE - Turn key all the way in the clockwise direction.

_____ B.2.5 CRT - Rocker switch in the front in the "ON" position.

B.3.0 INITIALIZING PROGRAM

_____ B.3.1 Program should automatically be displayed on screen.

_____ B.3.2 Verify heading 'DOSE Rev. 0, Date 9/16/83'. If heading differs, select another disk.

_____ B.3.3 Initial Display will indicate type of calculation options.

a. 'FORWARD CALCULATION' - using release rates calculates dose rates, integrated and projected doses for the EPB, 2, 5, and 10 miles and population centers.

Check ( )

b. 'BACK CALCULATION' - using field data measurements calculates the estimated release rates.

c. 'OFF CENTERLINE CALCULATION' - using release rates calculates dose rates for off-centerline points.

d. 'END CALCULATIONS' - takes you out of the DOSE program and should only be typed when all dose calculations are complete - not at the end of each calculation.

1. Typing "RUN <RETURN>" will return you to the DOSE program anytime the program is exited.

2. Exit the program during inputs or calculations by typing "<CONTROL> and C" simultaneously followed by "<RETURN>".

B.4.0 Type appropriate number of option desired and "<RETURN>" to the 'PROCEDURE' prompt.

B.5.0 FORWARD CALCULATIONS

B.5.1 To provide cumulative integrated releases, integrated doses and projected doses the system must be initialized to previous data.

a. Input total Iodine 131 and Noble Gas Micro-Curies released to this point. Enter zeros if this is the first calculations or obtain information from previous calculation sheets.

Check ( )

b. Input previous integrated doses to the population centers. Enter zeros if this is the first calculation or obtain information from previous calculation sheets.

c. Input previous integrated doses to the pre-established distances (EPB, 2, 5 and 10 miles). Enter zeros if this the first calculation or obtain information from the previous calculation sheets.

NOTE: PROGRAM WILL AUTOMATICALLY DETERMINE DISTANCE TO APPLICABLE EPB BASED ON WIND DIRECTION VERIFICATION MAY BE DONE USING TABLE C-1, Page 34.

ALL ABOVE DATA MUST BE RE-ENTERED ONLY IF PROGRAM IS EXITED OTHERWISE PROGRAM WILL AUTOMATICALLY UPDATE THIS INFORMATION WITH SUBSEQUENT CALCULATIONS.

_____ B.5.2 Type appropriate number of accident type to 'THE TYPE OF ACCIDENT IS' prompt. This will allow the program to determine correct isotopic mix of the release and subsequent decay corrections.

a. Accident type information should be obtained from the Technical Group.

b. If no information is available, use accident type 6 which is the default computer design basis accident mix.

_____ B.5.3 Enter current meteorological conditions. Refer to Attachment I, Page 56 for instructions on obtaining met data.

NOTE: PROGRAM WILL DETERMINE STABILITY CLASS AND IF TERRAIN CORRECTION FACTORS ARE REQUIRED.

Check ( )

_____ B.5.4 Obtain if and when the reactor shutdown from the technical group. If the reactor is still operating, no further entry is required. If the reactor has shutdown, enter time of shutdown in military time.

_____ B.5.5 Input the following current data:

a. TIME OF DATA - time (military) data was obtained from vent monitors and met towers.

b. TIME DOSE TO BE PROJECTED - projected number of hours release is expected to continue based on inplant accident conditions.

NOTE: IF THE EXPECTED TIME OF RELEASE TERMINATION IS UNKNOWN, USE A DEFAULT VALUE OF 6 HOURS.

c. TIME SINCE LAST DATA - number of minutes since last data was obtained from vent monitor and met tower for integrated release and dose calculations.

NOTE: IF THIS IS THE FIRST CALCULATION BEING PERFORMED, ENTER TIME IN MINUTES SINCE RELEASE STARTED. NORMAL TIME SINCE LAST DATA SHOULD BE 15 MINUTES.

d. SPING RELEASE DATA - summation of 5 vent monitors Iodine 131 and Noble Gas release rates in uCi/min obtained from SPING vent monitor as per Attachment J, Page 59.

NOTE: DATA MAY BE ENTERED IN REAL NUMBERS OR SCIENTIFIC NOTATION.

_____ B.5.6 Program should commence calculations as indicated by 'CALCULATING' appearing on the screen repeatedly.

Check ( )

_____ B.5.7 Results will be displayed on the CRT screen and will automatically be output to the printer.

NOTE: PRINTER MUST BE ON-LINE FOR PROGRAM TO CONTINUE. IF 'NOT SELECTED' APPEARS ON THE SCREEN, PRINTER IS NOT ON LINE. PRESS <SEL> BUTTON ON THE PRINTER (GREEN LIGHT MARKED SEL SHOULD COME ON). SIMULTANEOUSLY DEPRESS "<CONTROLS>" AND "C" FOLLOWED BY "<RETURN>".

_____ B.5.8 Press any letter to continue. Program will question 'DO YOU WISH ANOTHER COPY?' to allow you to obtain another copy of the printout if needed. Then program will return you to the calculation types option screen.

_____ B.5.9 To perform next update of a forward calculation enter a "1 <RETURN>" to the 'PROCEDURE' prompt.

_____ B.5.10 Program will question 'HAS THE ACCIDENT CHANGED?" and 'HAS THE WEATHER CHANGED?'.

a. If neither has changed program will return to Step B.5.4.

b. If the accident type has changed program will return to Step B.5.2.

c. If the weather has changed, program will return to Step B.5.3.

_____ B.5.11 Continue 15 minute updates of forward calculations as outlined above.

Check ( )

B.6.0 BACK CALCULATION

NOTE: IF THE BACK CALCULATION PORTION OF THE PROGRAM IS ENTERED BEFORE A FORWARD CALCULATION IS PERFORMED, THEN THE ACCIDENT TYPE INFORMATION, METEOROLOGICAL CONDITIONS AND THE REACTOR SHUTDOWN INFORMATION MUST BE ENTERED AS DELINEATED IN STEPS B.5.2 THROUGH B.5.4.

NOTE: IF THE BACK CALCULATION IS PERFORMED AFTER A FORWARD CALCULATION, THE PROGRAM WILL USE THE ACCIDENT TYPE, METEOROLOGICAL AND REACTOR SHUTDOWN CONDITIONS OF THE PREVIOUS FORWARD CALCULATION.

_____ B.6.1 Input the following current data:

a. TIME OF DATA - time (military) reading or sample was taken by offsite monitoring team at the given location.

b. DISTANCE TO MEASUREMENT - distance along the centerline in miles to location where reading or sample was taken by offsite monitoring team.

NOTE: BACK CALCULATIONS MAY ONLY BE PERFORMED FOR MONITORING POINTS ALONG THE CENTERLINE OF THE PLUME. REFER TO TABLE C-1 PAGE 34 FOR DISTANCES TO SITE BOUNDARY MONITORING TEAM LOCATIONS.

c. MEASURED DOSE RATE - whole body immersion dose rate in mrem/hr as measured by the monitoring team.

d. MEASURED I-131 CONCENTRATION - concentration of iodine in uCi/cc as determined by analysis of the air sample.

Check ( )

_____ B.6.2 Program should commence calculations as indicated by 'CALCULATING' appearing on the screen repeatedly.

_____ B.6.3 Results will be displayed on the screen and will automatically be output to the printer.

_____ B.6.4 Back Calculation Data Usage and Comparison

a. If performing back calculations to determine unknown source release terms, predicted iodine and noble gas release rates should be entered into a forward calculation to assess doses at other locations using 'TIME PLUME LEFT STACK' for 'TIME OF DATA' input.

b. If performing back calculations to verify known release source terms, compare predicted iodine and noble gas release rates to known releases using 'TIME PLUME LEFT STACK' as a reference.

_____ B.6.5 Document BACKCALCULATIONS using the BACKCALCULATION WORKSHEET, Attachment L, Page 62.

_____ B.6.6 Press any letter to continue. This will return you to the calculation types option screen.

B.7.0 OFF-CENTERLINE CALCULATION

NOTE: IF OFF-CENTERLINE CALCULATION PORTION OF THE PROGRAM IS ENTERED BEFORE A FORWARD CALCULATION IS PERFORMED, THEN THE ACCIDENT TYPE INFORMATION, METEOROLOGICAL CONDITIONS AND REACTOR SHUTDOWN INFORMATION MUST BE ENTERED AS DELINEATED IN STEPS B.5.2 THROUGH B.5.4.

Check ( )

IF THE OFF-CENTERLINE CALCULATION IS PERFORMED AFTER A FORWARD CALCULATION, THE PROGRAM WILL USE THE ACCIDENT TYPE, METEOROLOGICAL AND REACTOR SHUTDOWN CONDITIONS OF THE PREVIOUS FORWARD CALCULATION.

_____ B.7.1 Input the following current data:

a. TIME OF DATA - time (military) data was obtained from the vent monitors and met towers.

b. SPING RELEASE DATA - Iodine-131 and Noble Gas release rates in uCi/min obtained from SPING vent monitors.

c. CENTERLINE DISTANCE - distance in miles from plant to point of interest along the centerline of the plume.

d. OFF-CENTERLINE DISTANCE - perpendicular distance in miles from point of interest to centerline of the plume. (Imaginary line drawn from point of interest perpendicular to the centerline.)

NOTE: IF DOSE INFORMATION IS REQUIRED FOR CENTERLINE LOCATIONS OTHER THAN THOSE PREDETERMINED DISTANCES (EPB 2, 5 AND 10 MILES), ENTER CENTERLINE DISTANCE REQUIRED IN B.7.1.c AND ENTER ZERO FOR OFF-CENTERLINE DISTANCE IN B.7.1.d.

_____ B.7.2 Program should commence calculating as indicated by 'CALCULATING' appearing on the screen repeatedly.

_____ B.7.3 Results will be displayed on the CRT screen and will automatically be output to the printer.

Check ( )

_____

B.7.4 Press any letter to continue. This will return you to the calculation types option screen.

INSTRUCTIONS FOR RADDOSE

C.1.0 Program Description

The RADDOSE program provides for real time estimation of the whole body immersion and the iodine inhalation off-site doses due to emergency releases of radioactive material from Susquehanna SSES. RADDOSE has an automatic input of meteorological conditions with a manual edit ability. Radioactive release rates require manual calculator input.

The program uses a straight line Gaussian model for estimating the transport and diffusion characteristics of the plume. The program accounts for applicable terrain correction factors and wet deposition corrections due to precipitation. RADDOSE uses the appropriate isotope mix based on the type of accidents. Isotope decay correction factors are applied in a stepwise fashion from time release started. Plume transit decay time is not taken into account.

The RADDOSE program can provide estimated whole body and thyroid dose rates for off-centerline points and dose rates and integrated doses for population centers. RADDOSE provides estimated plume arrival times and the number of minutes before integrated doses will exceed the pre-established Protective Action Guides. In RADDOSE, doses may be calculated from 0.34-10 miles only. RADDOSE does not calculate projected doses.

In the event that a source term is unavailable or to verify release rates, actual field measurements of whole body dose rates or iodine concentrations may be used in the RADDOSE program to predict or verify the release source term. Using this information the dose rates at other locations may be calculated.

Check ( )

C.2.0 Activation of RADDOSE

_____ C.2.1 To activate RADDOSE, simultaneously depress the "<RADDOSE>" and the "<SHIFT>" keys.

NOTE: THE RADDOSE SERVICE MENU, WHICH PROVIDES A TABLEAU FOR ALL FUNCTIONAL OPTIONS AVAILABLE TO THE USER, WILL NOW APPEAR ON THE SCREEN.

_____ C.2.2 If anyone is currently using RADDOSE in the edit mode on another CRT, as indicated by the bottom of the Services Menu, contact them at the given extension before proceeding.

C.3.0 Initialization of RADDOSE

_____ C.3.1 Depress the "<TAB FWD>" key so that the cursor is located at the 'FUNCTION NUMBER' field.

_____ C.3.2 Enter "7" into the parenthesis then simultaneously depress the "<SHIFT>" and "<EXECUTE>" keys.

NOTE: FUNCTION NUMBER 7 WILL TERMINATE ANY CALCULATIONS PREVIOUSLY INITIATED IN RADDOSE.

_____ C.3.3 Depress the "<TAB BACK>" and enter "1", START OF RELEASE/CLEAR DATA, then simultaneously depress the two keys labeled "<SHIFT>" and "<EXEC>".

NOTE: FUNCTION NUMBER 1 IS THE ONLY ACCEPTABLE ENTRY FOLLOWING THE FUNCTION NUMBER 7.

C.4.0 Enter Calculation Time Data

_____ C.4.1 Depress the key labeled "<TAB BACK>" and enter "2", EDIT/VERIFY DATA then simultaneously depress the two keys labeled "<SHIFT>" and "<EXEC>".

Check ( )

_____ C.4.2 The screen will display page one of the input data, 'PROJECTED DOSE CALCULATION - MAIN INFORMATION'. Follow the instructions shown at the bottom of the screen for entering the information requested.

_____ C.4.2.1 Determine from the SPING the time of day when the radioactive release started. This will be the time of the first elevated release for which a dose calculation is being performed. Since RADDOSE utilizes military time, an input for 1:00 p.m. would be entered as 13 hours 0 minutes.

_____ C.4.2.2 Depress the "<TAB FWD>" key and enter this data in "Hours" and "Minutes" in the 'TIME RELEASE STARTED' fields.

_____ C.4.2.3 Depress the "<TAB FWD>" key so that the cursor is located at the 'PROTECTIVE ACTION GUIDE' field.

NOTE: THE PAG LEVELS HAVE DEFAULT VALUES OF ONE REM-WHOLE BODY AND FIVE REM-THYROID AND NEED NOT BE CHANGED UNLESS OTHER PAG LEVELS ARE DESIRED.

_____ C.4.2.4 Depress the "<TAB FWD>" key so that the cursor is located at the 'TYPE RELEASE' field. The release type has a default value of TYPE 10, COMPOSITE DESIGN BASIS (CDB), which should not be changed unless specific information is readily available to assign one of the other one through nine release types to the incident. No user action is usually required.

Check ( )

NOTE: RELEASE TYPE INFORMATION MAY BE OBTAINED BY CONSULTING WITH THE TECHNICAL GROUPS.

_____ C.4.2.5 Depress the "<TAB FWD>" key so that the cursor is located at the 'OUTPUT DEVICE' field. The output device has a default value of 1 to the logging printer and should not be changed. No user action is usually required.

Logging printer is located in the control room. The TSC and the EOF will use a video copier to obtain hard copy printouts of RADDOSE results.

_____ C.4.2.6 A 'CALCULATION START TIME' field entry is only needed when periodic calculations are desired, therefore no entry is required in this field.

_____ C.4.2.7 Verify that the correct information has been entered on this page then depress the <"SHIFT>" and "<EXEC>" keys simultaneously.

_____ C.4.2.8 To display page two of the input data 'PROJECTED DOSE - WEATHER CONDITIONS', simultaneously depress the "<SHIFT>" and "<PAGE FWD>" keys.

Check ( )

C.5.0 Enter Meteorological Data

Meteorological data is telemetered to RADDOSE from the primary and backup MET towers. Operator input of MET data is not normally required however the operator can substitute MET values at any time. Any values which an operator substitutes will be used instead of telemetered values in RADDOSE calculations. Instructions for manually obtaining met data are given in Attachment I, Page 56.

C.5.1 If manual substitution of MET data is necessary, follow the instructions shown at the bottom of the screen and given below. If no substitution is made in a field the program will use actual value from met tower. If manual substitution is not required press "<SHIFT>" and "<PAGE FWD>" keys and proceed to step C.6.0.

C.5.1.1 Depress the "<TAB FWD>" key so that the cursor is located at the 'STABILITY CLASS' field. The stability class is provided by computer calculation dependent on sigma theta or delta temperature measurements made on the MET towers. If MET tower data is not available, or additional information (e.g. forecasting) is needed, call the National Weather Bureau at (717) 655-9331 (under severe conditions call (717) 655-8134.

NOTE: LEAVE THIS FIELD BLANK TO ALLOW COMPUTER TO DETERMINE CORRECT STABILITY CLASS BASED ON DELTA T AND SIGMA THETA. IF A STABILITY CLASS IS ENTERED IT WILL OVERRIDE DELTA T AND SIGMA THETA INPUTS.

Check ( )

_____ C.5.1.2 Depress the "<TAB FWD>" key so that the cursor is located at the 'RATE OF PRECIPITATION' field and enter this value in inches per hour.

_____ C.5.1.3 Depress the "<TAB FWD>" key so that the cursor is located at the 'WIND SPEED' field and enter this value in miles per hour.

_____ C.5.1.4 Depress the "<TAB FWD>" key so that the cursor is located at the 'WIND DIRECTION' field and enter the direction wind is coming <u>from</u> in compass degrees.

_____ C.5.1.5 Depress the "<TAB FWD>" key so that the cursor is located at the 'SIGMA THETA' field and enter this value in compass degrees (if available - not necessary if delta T is known).

_____ C.5.1.6 Depress the "<TAB FWD>" key so that the cursor is located at the 'DELTA TEMPERATURE' field and enter this value in degrees celsius per fifty meters.

_____ C.5.1.7 No input is required in the 'MET TOWER SCAN SOURCE' field. The 'MET TOWER SCAN SOURCE' has a default to the 10 meter primary tower.

NOTE: IF DATA FROM THE 10 METER PRIMARY MET TOWER ARE UNAVAILABLE OR INVALID, RADDOSE WILL ATTEMPT TO ACQUIRE THE DATA FROM THE 10 METER BACKUP TOWER, IF THE BACKUP TOWER IS ALSO INOPERABLE, THE DATA WILL BE OBTAINED FROM THE 60 METER PRIMARY TOWER.

Check ( )

_____ C.5.1.8 Verify that the correct information has been entered on this page then simultaneously depress the two keys labeled "<SHIFT>" and "<EXEC>".

_____ C.5.1.9 To display page three of the input data 'PROJECTED DOSE - VENT DATA' depress the two keys labeled "<SHIFT>" and "<PAGE FWD>" simultaneously.

C.6.0 Enter Vent Release Data

_____ C.6.1 Follow the instructions shown at the bottom of the screen for entering the data requested.

NOTE: ACTIVITY DATA MUST BE SUPPLIED FOR ALL FIVE MONITORED VENTS EVEN IF THE RELEASE RATE IS ZERO AND MUST BE WRITTEN IN SCIENTIFIC NOTATION (i.e. 0 ENTERED AS 0E0). DATA MUST BE ENTERED BY COLUMNS ON PAGE 4 AND 5 OF INPUT.

_____ C.6.1.1 Obtain the release rates from the SPING readings for each vent monitor. Refer to Attachment J, Page 59 for instructions on obtaining SPING data.

_____ C.6.1.2 Depress the "<TAB FWD>" key so that the cursor is located at the 'COLUMN' field and enter the number corresponding to the vent for which the release data is to be entered.

NOTE: SPING RELEASE DATA IS GIVEN IN uCi/min AND IS A 10 MINUTE AVERAGED RELEASE RATE. RADDOSE REQUIRES A Ci/min INPUT. CONVERT UNITS BY MULTIPLYING uCi/min BY 10^{-6}.

Check ( )

_____ C.6.1.3 Depress the "TAB FWD" key so that the cursor is at the I^{131} field under CAM DATA. Enter the release rate for I^{131} (Curies/minute). SPING monitor gives I^{131} readings.

NOTE: IF I^{131} DATA IS NOT AVAILABLE, THEN LEAVE THE VALUE BLANK.

_____ C.6.1.4 No entry is required in the 'TTL IODINE' field.

NOTE: TOTAL IODINE RELEASE RATE INFORMATION WILL BE CALCULATED BY THE PROGRAM. BOTH RADIOIODINE RELEASE RATE FIELDS MAY BE LEFT BLANK IN WHICH CASE A DEFAULT VALUE WILL AUTOMATICALLY BE CALCULATED BASED ON THE NOBLE GAS RELEASE RATE. THIS VALUE WILL NOT APPEAR ON THE SCREEN.

_____ C.6.1.5 Depress the "<TAB FWD>" key so that the cursor is located at the 'NOBLE GAS' field. Enter the noble gas release rate (Curies/minute).

NOTE: A RELEASE RATE ENTRY FOR NOBLE GAS MUST BE MADE.

_____ C.6.1.6 If isotopic data is available from grab samples, depress the "<TAB FWD>" key and enter the release rate data (Ci/Min) for each isotope listed under 'ISOTOPE DATA'. This data is available from the Radiochemistry Analysis Report of a vent monitor grab sample.

Check ( )

NOTE: THIS DATA MAY BE ENTERED UNDER ANY OF THE VENT DATA COLUMNS BUT ALL FIVE MONITORED VENT DATA COLUMNS MUST HAVE EITHER ISOTOPIC DATA ENTERED OR CAM DATA ENTERED. IF ISOTOPIC DATA IS AVAILABLE THEN THE CAM DATA COLUMN SHOULD BE LEFT BLANK FOR THAT VENT.

_____ C.6.1.7 Verify that the correct information has been entered for the column, then simultaneously depress the two keys labeled <SHIFT>" and "<EXEC>".

_____ C.6.1.8 Return the cursor to the 'COLUMN' field and enter data for subsequent vents per Step C.6.1.1.

_____ C.6.1.9 Depress the keys labeled "<SHIFT>" and "<PAGE FWD>" and repeat steps C.6.1.1 through C.6.1.8 for page four of the input vent data.

_____ C.6.1.10 Depress the two keys labeled "<SHIFT>" and "<PAGE FWD>" to display page five of the input data 'PROJECTED DOSE - DISTANCE DATA'.

Check ( )

C.7.0 Enter Distance Data

NOTE: NINE DEFAULT SECTOR DISTANCES AND FIVE DEFAULT POINT DISTANCES HAVE BEEN ENTERED. DEFAULT DISTANCES MAY NOT BE DELETED.

_____ C.7.1 Enter distance to the Emergency Planning Boundary (EPB) of the affected sector based on the wind direction from Table C-1, Page 34. Depress "<TAB FWD>" Key until cursor is located in the 'DISTANCE' field and enter EPB distance from Table C-1.

NOTE: DISTANCE TO EPB WILL VARY WITH WIND DIRECTION SHIFTS.

_____ C.7.2 If additional points for dose calculation are desired, follow the instructions below. If not, proceed to step C.8.0.

_____ C.7.2.1 Depress the "<TAB FWD>" key until the cursor is located at the 'DISTANCE' field. Enter in any additional distance at which a dose rate is to be calculated.

_____ C.7.2.2 To delete sector distances entered through manual input depress the "<TAB FWD>" key so that the cursor is located at the 'CLEAR' field and enter the starting number through the ending number of the distances to be deleted. No entry in the 'THRU' field will result in only one entry deleted.

Check ( )

_____ C.7.2.3 Depress the "<TAB FWD>' key so that the cursor is located at the 'POINT DISTANCE' field. The user may enter point distances in the same manner as sector distances by specifying UTM coordinates. Refer to Table C-2, Page 35 for a list of frequently used UTM coordinates. A maximum of two extra point coordinates are available to the user.

_____ C.7.2.4 To delete point distances entered through manual input, depress the "<TAB FWD>" key so that the cursor is located at the 'CLEAR' field for the point distance. Enter the starting number and the ending number for the point distances to be deleted. No entry in the 'THRU' field will result in only one entry deleted.

C.7.3 If Back Calculations are not to be performed, proceed to step C.8.1.4.

C.8.0 Back Calculation Data

NOTE: SINCE PERFORMANCE OF A BACKCALCULATION IN THE REAL TIME FUNCTION UPDATES THE FORWARD CALCULATION ALSO, BACKCALCULATIONS SHOULD BE PERFORMED AT THE SAME TIME FORWARD CALCULATION INPUTS ARE ENTERED.

_____ C.8.1 Depress the "<TAB FWD>" key so that the cursor is located at the 'METERING POINT' field and follow the instructions shown at the bottom of the screen for entering the data requested.

_____ C.8.1.1 Enter the UTM coordinates corresponding to the location of the field measurements.

Check ( )

_____ C.8.1.2 Depress the "<TAB FWD>" key so that the cursor is at the 'WHOLE BODY DOSE RATE' field and enter the gamma dose rate in rads per hour, in exponential form, from field measurements.

NOTE: Field readings are normally reported in mR/hr; therefore, conversion to R/hr is required (Divide by 1000).

_____ C.8.1.3 Depress the "<TAB FWD>" key so that the cursor is located at the 'THYROID CONCENTRATION' field and enter the corresponding Iodine-131 concentration in Ci/m^3 from field measurements.

NOTE: Field air sample results are normally reported in $\mu Ci/cm^3$ which is equivalent to Ci/m^3.

_____ C.8.1.4 Verify that the correct information has been entered on this page then simultaneously depress the two keys labeled "<SHIFT>" and "<EXEC>" keys.

_____ C.8.1.5 After completing the above information, simultaneously depress the two keys labeled "<RADDOSE>" and "<SHIFT>". The RADDOSE menu will reappear on the console.

C.9.0 Edit Complete

_____ C.9.1 Depress the "<TAB FWD>" key so that the cursor is located at the 'FUNCTION NUMBER' field and enter "3". Simultaneously depress the two keys labeled "<SHIFT>" and "<EXEC>". This command will save the information entered into RADDOSE.

Check ( )

C.10.0 Run Calculations

_____ C.10.1 Return the cursor to the 'FUNCTION NUMBER' field. Enter "5" then simultaneously depress the "<SHIFT>" and "<EXEC>" keys. This command will run the calculations on the data entered.

_____ C.10.2 Display the data on the CRT by returning cursor to the 'FUNCTION NUMBER' field and entering "8".

NOTE: SCREEN DOES NOT UPDATE ONCE DISPLAYED THEREFORE IF RECENT CALCULATIONS ARE NOT COMPLETE (VERIFY THIS BY NOTING CALCULATION SEQUENCE NUMBER) "<SHIFT> AND "<PAGE FWD>" MUST BE PRESSED TO UPDATE SCREEN DISPLAY.

_____ C.10.3 Results Output:

Pages 1-12	Current Dose Rate and Integrated Doses for various distances.
Page 13	Backcalculation results and population center results.
Page 14	Plume Travel Time
Pages 15-17	Calculation inputs

NOTE: RADDOSE DOES NOT CALCULATE PROJECTED DOSES. THESE MUST BE HAND CALCULATED PER SECTION F.1.0, PAGES 49-50.

_____ C.10.4 Sequential calculations are run by returning to the RADDOSE menu by pressing "<SHIFT>", "<RADDOSE>" and entering "2" EDIT FUNCTION in the 'FUNCTION NUMBER' field per step C.4.0.

TABLE C-1

DISTANCE TO EPB AND OSCAR MONITORING TEAM LOCATIONS

Wind From	Affected Sector	Emerg. Plan Boundary Distance (EPB) (miles)	Distance to OSCAR Monitoring Team Location (miles)
SSW (191°-214°)	NNE	0.537	0.39
SW (214°-236°)	NE	0.701	0.422
WSW (236°-258°)	ENE	0.552	0.52
W (258°-281°)	E	0.507	0.45
WNW (281°-303°)	ESE	0.474	0.18
NW (303°-326°)	SE	0.341	0.20
NNW (326°-348°)	SSE	0.341	0.20
N (348°-11°)	S	0.341	0.25
NNE (11°-34°)	SSW	0.431	0.37
NE (34°-56°)	SW	0.429	0.33
ENE (57°-79°)	WSW	0.665	0.39
E (79°-101°)	*WSW	0.665	0.39
ESE (101°-124°)	*WSW	0.665	0.39
SE (124°-146°)	*WSW	0.665	0.39
SSE (146°-168°)	NNW	0.434	0.291
S (168°-191°)	N	0.411	0.29

* DUE TO MET STUDIES, WIND FROM SE, ESE AND E (AFFECTED SECTORS NW, WNW AND W) WILL ALWAYS BE DIRECTED TO THE WSW SECTOR.

TABLE C-2
UTM COORDINATE POINTS OF INTEREST FOR RADDOSE CALCULATIONS

I. Population Centers

*	1.	Berwick	4.5 miles WSW	(396.40, 4545.37)
*	2.	Nanticoke	10.0 miles NE	(415.50, 4561.12)
*	3.	Hazleton direction	10.0 miles SE	(415.50, 4537.81)
*	4.	Shickshinny	3.9 miles N	(403.50, 4556.00)
*	5.	Nescopeck	4.1 miles SW	(397.41, 4545.02)
	6.	Beach Haven	2.3 miles WSW	(401.10, 4546.80)
	7.	Berwick Heights	5.2 miles W	(395.23, 4548.30)
	8.	Briggsville	3.7 miles S	(403.70, 4543.30)
	9.	Hobbie	3.8 miles ESE	(409.00, 4547.00)
	10.	Mifflinville	8.6 miles WSW	(390.80, 4543.30)
	11.	Mocanaqua	3.1 miles N	(404.40, 4554.80)
	12.	Retreat	10.3 miles NNE	(409.00, 4560.00)
	13.	Pond Hill	3.1 miles NE	(407.20, 4553.10)
	14.	Wapwallopen	1.5 miles SSE	(404.65, 4547.20)

DEFAULT POINT DISTANCES

II. Emergency Offsite Radiation Monitoring Locations

Designation	Coordinates	Designation	Coordinates
N1	(403.6, 4550.4)	NNE1	(404.3, 4550.5)
N2	(403.4, 4551.6)	NNE2	(404.3, 4551.4)
N3	(403.9, 4553.4)	NNE3	(404.8, 4552.4)
N4	(403.8, 4555.9)	NNE4	(405.2, 4555.9)
N5	(403.8, 4556.8)	NNE5	(407.8, 4555.8)
N7	(402.5, 4557.9)	NNE7	(408.4, 4557.6)
N10A	(404.1, 4561.1)	NNE10A	(408.6, 4560.1)
N10B	(402.8, 4564.8)	NNE-10B	409.9, 4562.4
N50	(405.2, 4566.1)	NNE50	(410.6, 4565.7)
NE1	(404.5, 4550.2)	ENE1	(404.3, 4549.7)
NE2	(405.1, 4551.1)	ENE2	(405.4, 4550.2)
NE3	(405.2, 4551.1)	ENE3	(407.1, 4550.1)
NE4	(407.5, 4553.1)	ENE4	(408.8, 4550.3)
NE5	(409.3, 4553.9)	ENE7	(412.3, 4553.8)
NE7	(411.3, 4554.6)	ENE10A	(414.2, 4552.2)
NE10	(415.4, 4557.9)	ENE10B	(416.5, 4553.6)
NE50A	(415.7. 4562.8)	ENE50	(416.5, 4553.3)
NE50C	(425.6, 4564.5)		
NE50D	(425.7, 4566.7)		

Designation	Coordinates	Designation	Coordinates
E1	(404.8, 4549.5)	ESE1	(404.2, 4549.0)
E2	(405.7, 4549.4)	ESE2	(405.6, 4547.8)
E5	(410.7, 4548.5)	ESE3A	(406.8, 4547.9)
E7	(413.9, 4549.8)	ESE3B	(407.8, 4548.3)
E10	(415.6, 4549.9)	ESE4	(409.1, 4547.6)
E50	(420.7, 4551.4)	ESE5	(410.8, 4547.1)
		ESE7	(413.1, 4546.7)
		ESE10	(415.7, 4542.3)
		ESE50	(424.3, 4540.1)
SE1	(404.1, 4548.8)	SSE1	(404.1, 4548.0)
SE2A	(405.5, 4548.2)	SSE2	(404.7, 4547.3)
SE2B	(405.2, 4547.7)	SSE3	(405.1, 4545.8)
SE3	(406.8, 4546.6)	SSE4	(405.6, 4543.2)
SE4	(407.7, 4545.1)	SSE5	(406.8, 4542.8)
SE7A	(409.3, 4542.3)	SSE7	(406.9, 4539.8)
SE7B	(412.2, 4542.2)	SSE10A	(409.9, 4538.2)
SE10	(414.9, 4540.3)	SSE10B	(407.8, 4535.5)
SE50	(417.8, 4532.9)	SSE50	(413.4, 4532.6)
S1	(403.5, 4548.8)	SSW1	(403.4, 4548.8)
S2	(403.5, 4547.5)	SSW2	(402.7, 4546.7)
S3	(403.4, 4546.3)	SSW3	(401.1, 4545.2)
S4	(403.7, 4543.6)	SSW4	(401.6, 4543.7)
S7	(403.3, 4539.5)	SSW5	(400.0, 4542.7)
S10	(402.9, 4537.4)	SSW7	(398.4, 4541.7)
S50	(405.9, 4527.4)	SSW10	(398.2, 4537.2)
		SSW50	(391.8, 4532.1)
SW1	(403.7, 4548.6)	WSW1	(403.0, 4549.1)
SW2	(401.8, 4546.8)	WSW2	(401.5, 4548.5)
SW3	(401.5, 4546.6)	WSW3	(399.3, 4548.1)
SW4	(399.6, 4545.7)	WSW4	(398.1, 4547.3)
SW5A	(399.3, 4544.1)	WSW5	(396.5, 4546.9)
SW5B	(397.7, 4544.9)	WSW7A	(396.3, 4545.5)
SW7	(396.6, 4542.8)	WSW7B	(393.4, 4545.6)
SW10	(393.9, 4540.3)	WSW10A	(391.5, 4543.7)
SW50	(391.2, 4534.8)	WSW10B	(390.8, 4593.1)
		WSW50	(388.5, 4543.3)

Designation	Coordinates	Designation	Coordinates
W1	(402.2, 4549.6)	WNW1	(402.7, 4549.7)
W2	(401.5, 4549.5)	WNW2	(401.6, 4550.5)
W3	(399.8, 4548.7)	WNW3	(399.5, 4551.2)
W4	(398.2, 4549.7)	WNW4	(398.1, 4551.0)
W5	(396.9, 4548.8)	WNW7	(395.1, 4551.9)
W7	(394.5, 4549.6)	WNW10	(390.6, 4554.4)
W10	(389.2, 4548.8)	WNW50	(385.8, 4554.4)
W50	(385.7, 4547.7)		
NW1	(401.7, 4550.3)	NNW1	(403.1, 4550.7)
NW2	(401.7, 4551.5)	NNW2	(402.4, 4551.6)
NW3	(400.8, 4551.5)	NNW5	(400.3, 4555.2)
NW5	(398.4, 4554.0)	NNW7	(398.6, 4557.6)
NW7	(398.8, 4556.4)	NNW10	(396.8, 4560.4)
NW10	(394.6, 4559.2)	NNW50	(398.3, 4560.4)
NW50	(390.3, 4561.3)		

INSTRUCTIONS FOR OVERLAYS

D.1.0 METHOD DESCRIPTION

The Overlay method provides for an estimation of the whole body immersion and the iodine inhalation off-site doses due to releases of radioactive material from Susquehanna SES. The Overlay method provides a graphic representation of the plume dispersion using transparent dose isopleths which are overlaid on the SSES Emergency Planning Map.

The Overlay calculation method uses a straight line Gaussian model for estimating the transport and diffusion characteristics of the plume. The special overlays account for terrain corrections based on met conditions. Overlays use LOCA isotopic mix and decay correction factor from time of reactor shutdown is applied.

Using the Overlays, dose rates for off-centerline points and populations centers can be calculated. Overlays can be used to calculate dose rates from 1.5-10 miles only.

D.2.0 OVERLAY SELECTION

_____ D.2.1 Determine the stability class curve from Table D-1 using Delta Temperature or Sigma Theta.

_____ D.2.2 Using the wind speed, wind direction and stability class data, determine the overlays to be used from Table D-2, Page 44. The odd numbered overlays are for the whole body dose rates and the even numbered overlays are for the thyroid dose rates. Enter the number of the overlays selected on the Overlay Calculation Worksheet, Attachment E, Page 48.

_____ D.2.3 Determine a wind speed correction factor from Table D-3, Page 45 and enter this factor on the Overlay Calculation Worksheet, Page 48.

D.3.0 Calculate a Whole Body Dose Rate

_____ D.3.1 Place the selected whole body overlay on the SSES Emergency Planning Map with the origin of the plume isopleth over SSES on the intersection of the sector dividing lines. Orient the red arrow according to the directions on the overlay.

_____ D.3.2 For each map location of interest, read off of the overlay an uncorrected dose rate in rads/min and enter on the Overlay Calculation Worksheet.

NOTE: INTERPOLATION BETWEEN DOSE ISOPLETH LINES MAY BE REQUIRED.

D.3.3 The following locations should be addressed.

2 miles radial distance from SSES on plume centerline

5 miles radial distance from SSES on plume centerline

10 miles radial distance from SSES on plume centerline

D.3.4 Obtain the total Noble Gas release rate expressed in microcuries/minute. This data should be entered on Offsite Dose Calculation Worksheet. Refer to Attachment J, Page 59 for instructions on obtaining SPING data.

D.3.5 Obtain the time since reactor shutdown by subtracting the data time from the time of the shutdown listed on the "Big Picture" status board.

D.3.6 Using the time since reactor shutdown and Table D-4, determine a whole body dose correction factor and enter on the Overlay Calculation Worksheet.

D.3.7 Calculate a corrected whole body dose rate in mrem/hr for each map location of interest by multiplying the uncorrected dose rate for the location by the wind speed correction factor, the total Noble Gas release rate, the whole body dose correction factor and by .06 as shown below.

Corrected whole body dose = (mrad/hr)

Uncorrected dose rate	x	Noble gas release rate (uCi/min)	x	Whole body correction factor	x	Wind Speed correction factor	x	.06

Enter the corrected dose rate on Data Sheet 2, Offsite Dose Calculation Worksheet, Attachment K, Page 61.

D.4.0 Calculate a Thyroid Dose Rate

_____ D.4.1 Place the thyroid overlay on the SSES Emergency Planning Map with the origin of the plume isopleth over SSES on the intersection of the sector dividing lines. Orient the red arrow according to the directions on the overlay.

_____ D.4.2 For each map location of interest, read off of the overlay an uncorrected dose rate in rads/min and enter on the Overlay Calculation Worksheet.

NOTE: INTERPOLATION BETWEEN DOSE ISOPLETH LINES MAY BE REQUIRED.

_____ D.4.3 The following locations should be addressed.

2 miles radial distance from SSES on plume centerline

5 miles radial distance from SSES on plume centerline

10 miles radial distance from SSES on plume centerline

_____ D.4.4 Obtain the total Iodine-131 release rate expressed in microcuries/minute. This data should be entered on Offsite Dose Calculation Worksheet. Refer to Attachment J for instructions on obtaining SPING data.

_____ D.4.5 Obtain the time since reactor shutdown by subtracting the data time from the time of the shutdown listed on the "Big Picture" status board.

_____ D.4.6 Using the time since reactor shutdown and Table D-5, determine a thyroid dose correction factor and enter on the Overlay Calculation Worksheet.

_____ D.4.7 Calculate a corrected thyroid dose rate in mrem/hr for each map location of interest by multiplying the uncorrected thyroid dose rate for each location by the wind speed correction factor, the total Iodine-131 release rate, the thyroid dose correction factor and by .6 as shown below.

Corrected thyroid dose = (mrem/hr)

Uncorrected dose rate x Iodine-131 release rate (uCi/min) x Wind speed correction factor x Thyroid dose correction factor x .6

Enter the corrected dose rate on Attachment H of this procedure.

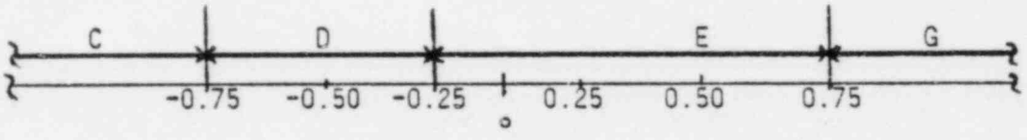
NOTE: INTEGRATED AND PROJECTED DOSES MUST BE HAND CALCULATED BASED ON THESE DOSE RATES AS OUTLINED IN SECTION F.1.0, PAGES 49-50.

TABLE D-1

STABILITY CLASS DETERMINATION

Delta Temp (°C/50m)	Sigma Theta ° (degrees)	Selected Stability Class Curve
≤ - 0.75	≥ 12.5	Unstable (C)
- 0.74 to - 0.25	12.4 to 7.5	Neutral (D)
- 0.24 to 0.75	7.4 to 3.8	Slightly Stable (E)
≥ 0.75	< 3.8	Very Stable (G)

STABILITY CLASS



DELTA TEMP

TABLE D-2 - OVERLAY SELECTION

Wind From	OVERLAYS TO BE USED** Stability C	Stability D	Stability E	Stability G
N (348°-11°)	1 & 2	3 & 4	5 & 6	7 & 8
NNE (11°-34°)	21 & 22	23 & 24	9 & 10	11 & 12
NE (34°-56°)	25 & 26	27 & 28	13 & 14	15 & 16
ENE (56°-79°) E * (79°-101°) ESE * (101°-124°) SE * (124°-146°) SSE (146°-168°) S, SSW, SW (168°-236°) Wind Speed >9 mph	1 & 2	3 & 4	5 & 6	7 & 8
S, SSW, SW (168°-236°) Wind Speed <9 mph	29 & 30	31 & 32	17 & 18	19 & 20
WSW (236°-258°) Wind Speed >5 mph	1 & 2	3 & 4	5 & 6	7 & 8
WSW (236°-258°) Wind Speed <5 mph	29 & 30	31 & 32	17 & 18	19 & 20
W (258°-281°) WNW (281°-303°) NW (303°-326°) NNW (326°-348°)	1 & 2	3 & 4	5 & 6	7 & 8

* Assume ENE wind direction.- (AFFECTED SECTOR FOR THESE WIND DIRECTIONS WILL ALWAYS BE WSW)

** Odd Numbers - Whole Body
Even Numbers - Thyroid

TABLE D-3
WIND SPEED CORRECTION FACTORS

Wind Speed (MPH)	Correction Factor	Wind Speed (MPH)	Correction Factor
0	10.0		
0.1	10.0	6.0	0.17
0.2	5.0	7.0	0.14
0.3	3.3	8.0	0.13
0.4	2.5	9.0	0.11
0.5	2.0		
0.6	1.7	10	0.100
0.7	1.4	20	0.050
0.8	1.3	30	0.033
0.9	1.1	40	0.025
		50	0.020
1.0	1.00	60	0.017
2.0	0.50	70	0.014
3.0	0.33	80	0.013
4.0	0.25	90	0.011
5.0	0.20	100	0.010

TABLE D-4
WHOLE BODY DOSE CORRECTION FACTOR

Time Since Reactor Shutdown (hrs.)	Correction Factor	Time Since Reactor Shutdown (hrs.)	Correction Factor
Not Shutdown	1.10		
0.01	1.10	6.0	0.44
0.02	1.05	7.0	0.37
0.03	1.00	8.0	0.37
0.04	1.00	9.0	0.35
0.05	1.00		
0.06	1.00	10	0.33
0.07	1.00	20	0.22
0.08	1.00	30	0.18
0.09	1.00	40	0.16
		50	0.15
0.1	1.00	60	0.14
0.2	0.95	70	0.14
0.3	0.93	80	0.13
0.4	0.90	90	0.13
0.5	0.90		
0.6	0.88	100	0.13
0.7	0.85	200	0.12
0.8	0.84	300	0.11
0.9	0.81	400	0.11
		500	0.11
1.0	0.80	600	0.11
2.0	0.70	700	0.11
3.0	0.60	800	0.11
4.0	0.52	900	0.11
5.0	0.48	1,000	0.11

TABLE D.5
THYROID DOSE CORRECTION FACTOR

Time Since Reactor Shutdown (hrs.)	Correction Factor	Time Since Reactor Shutdown (hrs.)	Correction Factor
Not Shutdown	0.80		
0.01	0.80	6.0	1.6
0.02	0.80	7.0	1.6
0.03	0.80	8.0	1.7
0.04	0.80	9.0	1.8
0.05	0.80		
0.06	0.81	10	1.9
0.07	0.82	20	2.4
0.08	0.83	30	2.6
0.09	0.84	40	2.9
		50	3.0
0.1	0.84	60	3.2
0.2	0.87	70	3.4
0.3	0.89	80	3.5
0.4	0.90	90	3.6
0.5	0.91		
0.6	0.93	100	3.8
0.7	0.95	200	4.0
0.8	0.98	300	4.3
0.9	1.00	400	4.4
		500	4.5
1.0	1.0	600	4.6
2.0	1.2	700	4.7
3.0	1.3	800	4.7
4.0	1.4	900	4.7
5.0	1.5	1,000	4.7

OVERLAY CALCULATION WORKSHEET

Date _____ Data Time _____

STABILITY CLASS _____

WHOLE BODY Overlay No _____

Wind Speed Correction Factor (Table D-3)		Noble Gas Release Rate (uCi/min)		Whole Body Correction Factor (Table D-4)		.06		Uncorrected Whole Body Dose Rates (from overlay)		Corrected Whole Body Dose Rate (mrem/hr)
_____	X	_____	X	_____	X	.06	X	_____(2 miles)	=	_____(2 miles)
								_____(5 miles)	=	_____(5 miles)
								_____(10 miles)	=	_____(10 miles)

THYROID OVERLAY NO _____

Wind Speed Correction Factor (Table D-3)		Iodine Release Rate (uCi/min)		Thyroid Dose Correction Factor (Table D-5)		.6		Uncorrected Thyroid Dose Rates (from overlay)		Corrected Thyroid Dose Rate (mrem/hr)
_____	X	_____	X	_____	X	.6	X	_____(2 miles)	=	_____(2 miles)
								_____(5 miles)	=	_____(5 miles)
								_____(10 miles)	=	_____(10 miles)

Check ( )

F.1.0 Instructions for Manual Calculations

F.1.1 Integrated and Projected Doses

The integrated dose is the total dose (mrem) that an individual receives from an initial release time to the present time release.

The projected dose is the total dose that a person will be expected to receive for the entire duration of the release. When considering emergency off-site dose calculations, the projected dose is the sum of the integrated dose plus the dose that the person will be expected to receive from the present time to some time in the future.

F.1.1.1 Before calculating the integrated and projected doses, the dose rate (mr/hr) may be obtained for both the whole body and thyroid from any of the three available dose calculational systems.

F.1.1.2 Integrated Dose - The total integrated dose (mrem) is calculated by multiplying the current dose rate (mr/hr) times the amount of time for which the release was occurring (usually 0.25 hrs) then adding this value to the previous integrated total dose as shown below.

$$\begin{matrix}\text{INTEGRATED}\\ \text{DOSE}\\ \text{(mrem)}\end{matrix} = \left[\begin{matrix}\text{CURRENT}\\ \text{DOSE RATE}\\ \text{(mrem/hr)}\end{matrix} \times \begin{matrix}\text{TIME}\\ \text{RELEASE}\\ \text{OCCURRING}\\ \text{(hrs)}\end{matrix}\right] + \begin{matrix}\text{PREVIOUS}\\ \text{INTEGRATED}\\ \text{DOSE}\\ \text{(mrem)}\end{matrix}$$

NOTE: NORMALLY, RELEASE RATES ARE FOR A 15 MINUTE AVERAGE. THEREFORE TIME RELEASE OCCURRING WOULD BE 0.25 hrs (15 MIN).

F.1.1.3 Projected Dose - The projected dose (mrem) is calculated by multiplying the current dose rate (mr/hr) by the amount of time for which the release is expected to continue (hours) and adding this value to the current total integrated dose (mrem) as shown below:

$$\text{PROJECTED DOSE (mrem)} = \left[\text{CURRENT DOSE RATE (mrem/hr)} \times \text{TIME RELEASE EXPECTED TO CONTINUE (hrs)}\right] + \text{CURRENT INTEGRATED DOSE (mrem)}$$

NOTE: UNLESS SPECIFIC INFORMATION PERTAINING TO THE TIME THE RELEASE WILL BE TERMINATED IS AVAILABLE, THEN ASSUME THAT THE RELEASE WILL CONTINUE FOR SIX HOURS AND USE THIS AS YOUR PROJECTION TIME. THIS SIX-HOUR INTERVAL REPRESENTS THE AVERAGE AMOUNT OF TIME REQUIRED TO EVACUATE THE TEN-MILE EMERGENCY PLANNING ZONE.

F.2.0 Integrated Releases

F.2.1 The Integrated release (uCi) is the total release which has occurred from the onset of the accident to the present time. The integrated release is calculated by multiplying the current release rate (μCi/min) by the amount of time for which the release was occurring (usually 15 min.) and adding this to the previous total integrated release as shown below. Since SPING data is obtained every 15 minutes then the integration period is assumed to be 15 minutes. Calculate integrated releases as shown below:

$$\text{INTEGRATED RELEASE (μCi)} = \left[\text{RELEASE RATE (μCi/min)} \times \text{TIME RELEASE OCCURRING (min)}\right] + \text{PREVIOUS INTEGRATED RELEASE (μCi)}$$

F.3.0 Plume Travel Time

To calculate the time the current release will arrive at the required distance, take the distance in miles, divide by the wind speed in miles per hour, and add this to the time the release left the stack (DATA TIME) as shown below:

$$\text{CURRENT RELEASE WILL ARRIVE AT (TIME)} = \left[\frac{\text{DISTANCE (MILES)}}{\text{WIND SPEED (MPH)}}\right] + \text{DATA TIME}$$

Check ( )

G.1.0 Instructions For Determination of Total Population Dose (man-rem)

_____ G.1.1 Estimates of the population dose from an unexpected release may be obtained by integrating the dose rate over the area of consideration then multiplying by the number of people living in that area.

_____ G.1.2 This procedure provides for determination of the total population dose (man-rem) within the SSES 10 mile Emergency Planning Zone.

G.2.0 Determination of Integrated Dose

_____ G.2.1 Obtain the total integrated whole body and thyroid doses (mrem), for the first affected sector at 2 miles, from the last Offsite Dose Calculation Worksheet convert units to rem and record this on the Population Dose Worksheet, Attachment H, Page 55.

_____ G.2.2 Determine the total population within the first affected sector between 0-3 miles from the site using the DISTRIBUTION OF EPZ POPULATION, FIGURE G-1, Page 54, and record this on the Worksheet.

_____ G.2.3 Multiply the total integrated whole body and thyroid doses (rem) at 2 miles by the total population residing between 0 and 3 miles from the site. This will yield an estimate of the total population dose to the whole body and thyroid within the affected sector out to 3 miles from the plant.

_____ G.2.4 Obtain the population dose for each remaining segment of the sector for both the thyroid and whole body out to the perimeter of the EPZ boundary and record this on the POPULATION DOSE WORKSHEET.

_____ G.2.5 Repeat steps G.2.1 through G.2.4 for each affected sector and record on the POPULATION DOSE WORKSHEET.

_____ G.2.6 To determine the best estimate of the total population doses to the thyroid and whole body (man-rem) as a result of the release, sum the thyroid and whole body population doses per segment for each affected sector.

NOTE: THIS PROCEDURE IS INTENDED TO BE USED AS A GUIDELINE TO ARRIVE AT A QUICK ESTIMATE OF THE TOTAL POPULATION DOSE AS A RESULT OF AN UNEXPECTED RELEASE FROM SSES. IT IS NOT INTENDED TO YIELD DEFINITIVE RESULTS OF TOTAL POPULATION DOSES.

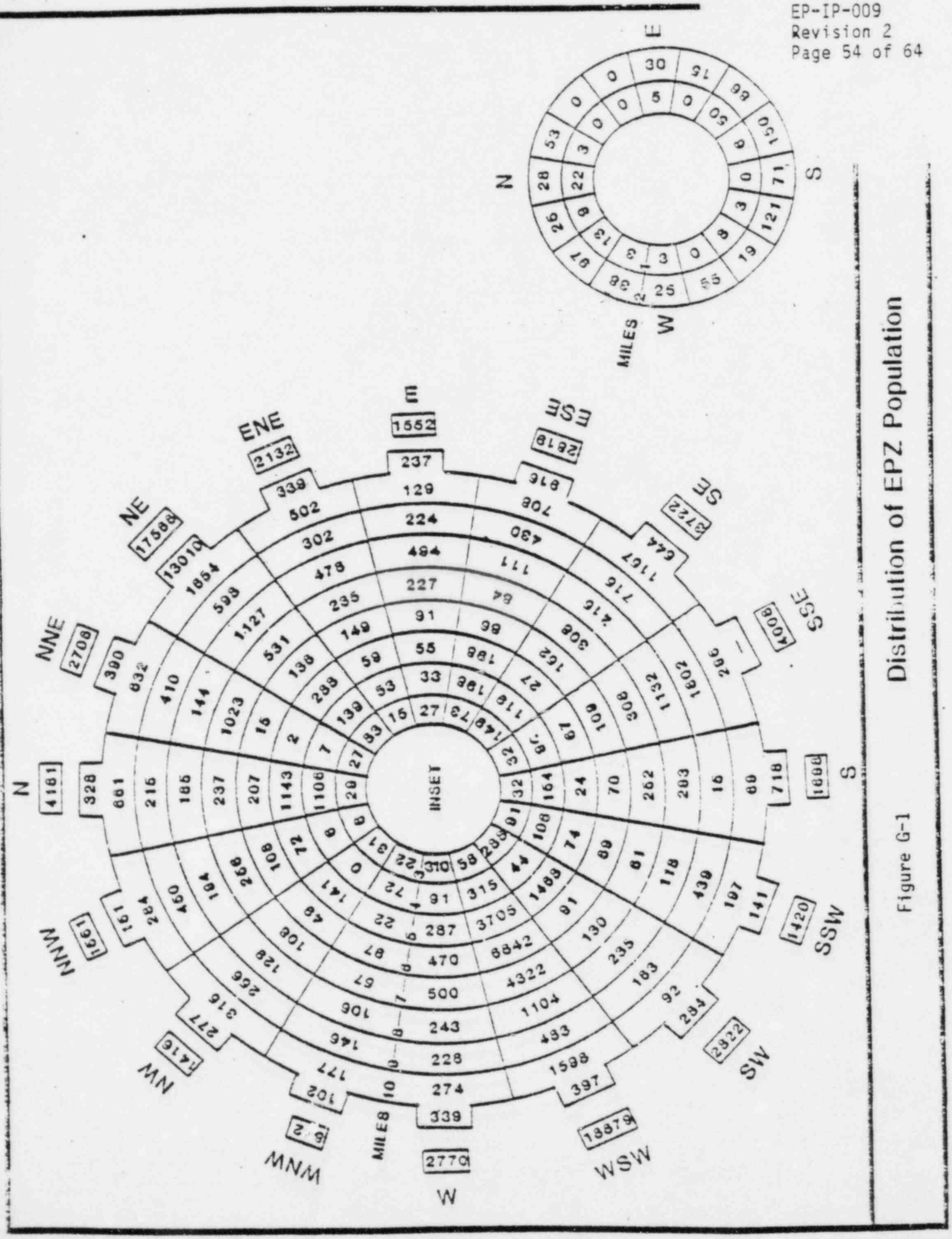


Figure G-1 Distribution of EPZ Population

POPULATION DOSE WORKSHEET

AFFECTED SECTOR _____

DISTANCE (MILES)	A INTEGRATED THYROID DOSE (REM)	B INTEGRATED WHOLE BODY DOSE (REM)	C POPULATION WITHIN THE FOLLOWING DISTANCES (MAN)	POPULATION DOSE PER SEGMENT THYROID (MAN-REM) (A) x (C)	WHOLE BODY (MAN-REM) (B) x (C)
2.0	_____	_____ (0-3 miles)	_____	_____	_____
5.0	_____	_____ (3-7 miles)	_____	_____	_____
10.0	_____	_____ (7-EPZ Boundary)	_____	_____	_____

AFFECTED SECTOR _____

DISTANCE (MILES)	A INTEGRATED THYROID DOSE (REM)	B INTEGRATED WHOLE BODY DOSE (REM)	C POPULATION WITHIN THE FOLLOWING DISTANCES (MAN)	POPULATION DOSE PER SEGMENT THYROID (MAN-REM) (A) x (C)	WHOLE BODY (MAN-REM) (B) x (C)
2.0	_____	_____ (0-3 miles)	_____	_____	_____
5.0	_____	_____ (3-7 miles)	_____	_____	_____
10.0	_____	_____ (7-EPZ Boundary)	_____	_____	_____

TOTAL POPULATION DOSE TO THYROID (MAN-REM) _____

TOTAL POPULATION DOSE TO WHOLE BODY (MAN-REM) _____

I.1.0 INSTRUCTIONS FOR OBTAINING METEOROLOGICAL DATA

NOTE: Meteorological data is automatically input into the RADDOSE program on page 2 of 5 'PROJECTED DOSE-WEATHER CONDITIONS'.

I.1.1 Simultaneously press "<SHIFT>" and "<GRP/PT>" keys. 'GROUP POINT DISPLAY SERVICES' will be displayed on CRT.

I.1.2 Press "<TAB FWD>" TO 'GROUP NUMBER' and enter "14". Press "<TAB FWD>" to 'OPTION' and enter "1" followed by "<SHIFT>" "<EXEC>". MET DATA (EXPLAN DISPLAY) Figure I-1 should be displayed.

I.1.3 To assemble a group point if Figure I-1 is not displayed perform the following steps:

a. Contact Operations to determine which Group Point may be deleted to add MET DATA - (E-Plan Display) prior to making any changes.

b. Simultaneously press "<SHIFT>" and "<GRP/PT>" Keys.

c. Press "<TAB FWD>" to 'GROUP NUMBER' and enter number indicated by Operations.

d. Press "<TAB FWD>" to 'OPTION' and enter "2". Display will change to alter 'GROUP POINT DISPLAY SERVICES'.

e. Clear group by pressing "<TAB FWD>" to 'CLEAR GROUP' and entering "X". Assemble new group as per Figure I-1 following instructions given at the bottom of the screen.

f. Display assembled Group Point and future met data updates as outlined in Step I.1.1 and I.1.2.

I.1.4 If a Group Point is unavailable, meteorological data may be accessed through the single point identifications as follows:

a. Simultaneously press "<SHIFT>" and "<SINGLE POINT>" Keys 'SINGLE POINT DATA REPORT SELECTION' will be displayed.

b. Press "<TAB FWD>" to 'STARTING POINT ID:' and enter single point ID per Figure I-1 followed by "<SHIFT>" "<EXEC>".

c. Display will change to 'SINGLE POINT DATA SERVICES' for that single point ID. 'EU VALUE' in the top right hand corner is the required met value.

d. Repeat Steps a through c for remaining single point ID's until all required data is obtained.

MET DATA (E-PLAN DISPLAY)

UNIT 1, PAGE 1 OF 1 GROUP POINT DISPLAY SERVICES 08-10-83 19:03:14

GROUP NUMBER: 14 MET DATA (E-PLAN DISPLAY)

POINT NO.	DESCRIPTION	ALARM STATE	IS NOW	HAS LAST	HIGH LIMIT	LOW LIMIT	UNITS
VHA03	WIND DIR-10M-METAVG				NONE	NONE	DEGRS
VHA06	WIND SPEED-10M-METAVG				NONE	NONE	MPH
VHA01	DELTA TEMP A-DEGC/50M				NONE	NONE	DEG C
VHA09	RAINFALL RATE-IN/HR				NONE	NONE	
VHA10	SIGMA THETA-10M-METAVG				NONE	NONE	DEGRS
VHA05	WIND DIR-BKUP TWR-METAVG				NONE	NONE	DEGRS
VHA08	WIND SPEED-BKUP-METAVG				NONE	NONE	MPH
VHA02	DELTA TEMP B-DEGC/50M				NONE	NONE	DEG C
VHA12	SIGMA THETA-BKUP-METAVG				NONE	NONE	DEGRS
VHA04	WIND DIR-60M-METAVG		0.		NONE	NONE	DEGRS
VHA07	WIND SPEED-60M-METAVG		0.		NONE	NONE	MPH

Figure I-1

GP505.JDS ROP-7A 8/30/83

J.1.0 INSTRUCTIONS FOR OBTAINING GASEOUS EFFLUENT RELEASE RATES

J.1.1 Turn "KEYBOARD" key switch clockwise to on position "KB ENABLE" light will go on.

NOTE: Key is normally in the terminal.

J.1.2 Turn "HISTORY FORMAT" switch to the "RELEASE RATE" position.

J.1.3 Press <HIST MIN> followed by the number 0301 RB Particulate and the <ENTER>. Wait for printout. The last 23 ten-minute averages of the activity (µCi or µCi/cc) will be displayed followed by the current activity.

J.1.4 Press <PRINT>, <FILE> (on lower Key pad) and <ENTER>. Wait for printout.

The last 23 ten-minute averages of the release rate (uCi/min) will be printed.

J.1.5 The next to the last number on the printout is the average particulate release rate from the Unit 1 Reactor Building SPING vent monitor averaged over the previous 10 minutes. The release rates are presented in uCi/minute.

J.1.6 Repeat steps J.1.3 through J.1.5 substituting the following numbers for "0301" in step J.1.3 to obtain the release rates for the additional channels.

#1 Rx Bldg. Particulate	0301
#1 Rx Bldg. Iodine	0303
#1 Rx Bldg. Noble Gas	0305,0307,0309*
#1 Turbine Bldg. Particulate	0501
#1 Turbine Bldg. Iodine	0503
#1 Turbine Bldg. Noble Gas	0505,0507,0509*
SGTS Particulate	0601
SGTS Iodine	0603
SGTS Noble Gas	0605,0607,0609*
#2 Rx Bldg. Particulate	0401
#2 Rx. Bldg. Iodine	0403
#2 Rx. Bldg. Noble Gas	0405,0407,0409*
#2 Turbine Bldg. Particulate	0701
#2 Turbine Bldg. Iodine	0703
#2 Turbine Bldg. Noble Gas	0705,0707,0709*

*See Step J.1.7.

J.1.7 When accessing NG channels compare the next to the last number in the first printout (step J.1.3) to the following table. When values are greater than or equal to the upper limit listed for that channel the next range channel must be accessed.

CHANNEL	RANGE	LIMIT (uCi/cc)
XX05	LOW	$\leq$ 2.2E-2
XX07	MID	$\leq$ 7.8E1
XX09	HIGH	$>$ 7.8E1

J.1.8 Turn keyboard switch counter-clockwise to disable keyboard before leaving.

J.2.0 Presently, EOF personnel must obtain the Vent Release data via telephone lines.

1. Normal path shall be from TSC Data Link to EOF Data Link.

2. Alternate pathway shall be directly from TSC Dose Calculator to EOF Dose Calculator.

CONTROL NO. _____
TIME TRANSMITTED: _____
DATE: _____

OFFSITE DOSE CALCULATION WORKSHEET

DATA TIME: _____
DATE: _____

ACCIDENT DATA TYPE_____ R_X SHUTDOWN TIME/DATE_____/_____

MET DATA
WIND DIRECTION FROM_____° PRECIPITATION RATE_____in./hr.
WIND SPEED_____mph △ TEMPERATURE_____°C/50m.
SIGMA THETA_____° STABILITY CLASS_____

VENT RELEASE DATA

	IODINE (uCi/min.)	NOBLE GAS (uCi/min.)
1R		
2R		
1T		
2T		
SBGT		
TOTAL		

DOSE DATA: CALCULATION SEQUENCE # _____

FROM: _____ DOSE _____ OVERLAY
_____ RADDOSE _____ BACKCALCULATION

NOTE: CIRCLE Emergency Plan Boundary Dose Rate if measured by monitoring team.

	EPB ____ mi.	2 mi.	5 mi.	10 mi.	
Current Dose Rate					CLASSIFICATION
Whole Body (mrem/hr)					
Thyroid (mrem/hr)					
Current Release Will Arrive At (time)					
Integrated Dose					PROTECTIVE ACTION
Whole Body (mrem)					
Thyroid (mrem)					
Projected Dose for _____ hours					PROTECTIVE ACTION
Whole Body (mrem)					
Thyroid (mrem)					

BACK CALCULATION WORKSHEET

ACCIDENT DATA:

ACCIDENT TYPE _____ TIME OF REACTOR SHUTDOWN _____

MET DATA:

WIND DIRECTION (from) _____° ΔTEMPERATURE _____°C/50m

WIND SPEED _____ MPH PRECIPITATION RATE _____ INCHES/HR

VENT EFFLUENT RELEASE DATA:

_____MONITORED _____UNMONITORED

TIME OF FIELD MEASUREMENTS: _____

LOCATION/DISTANCE: _____

MEASURED FIELD READINGS:

WHOLE BODY DOSE RATE: _____mR/hr

IODINE CONCENTRATION _____µCi/cc

PREDICTED VENT RELEASE RATES:
TIME RELEASE LEFT STACK: _____

IODINE _____µCi/min

NOBLE GAS _____µCi/min

ACTUAL RELEASE RATES AT
_____TIME

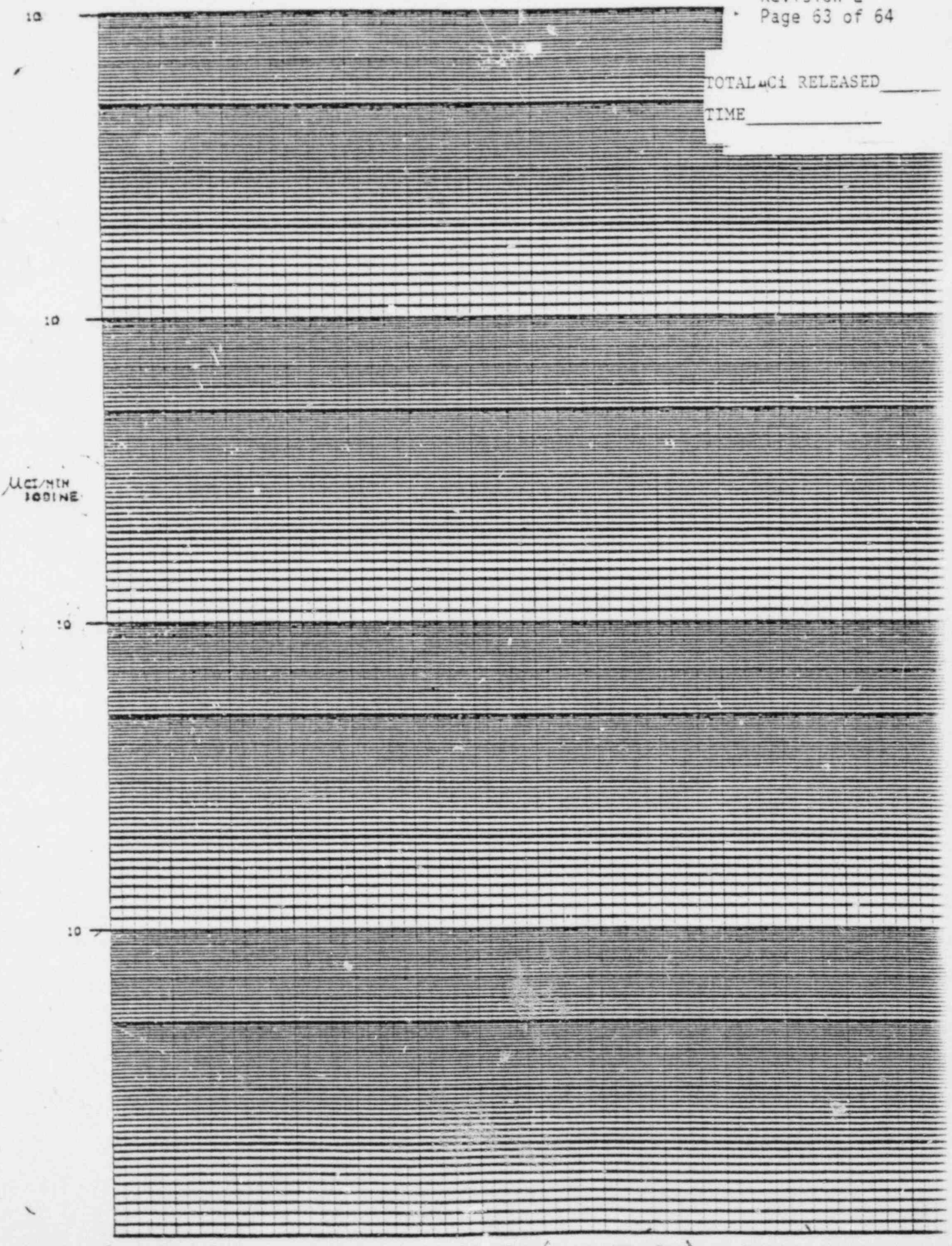
IODINE _____µCi/min

NOBLE GAS _____µCi/min

RELEASE RATE TRENDING GRAPH
RELEASE RATE VS. TIME FOR IODINE

TOTAL μCi RELEASED _____

TIME _____

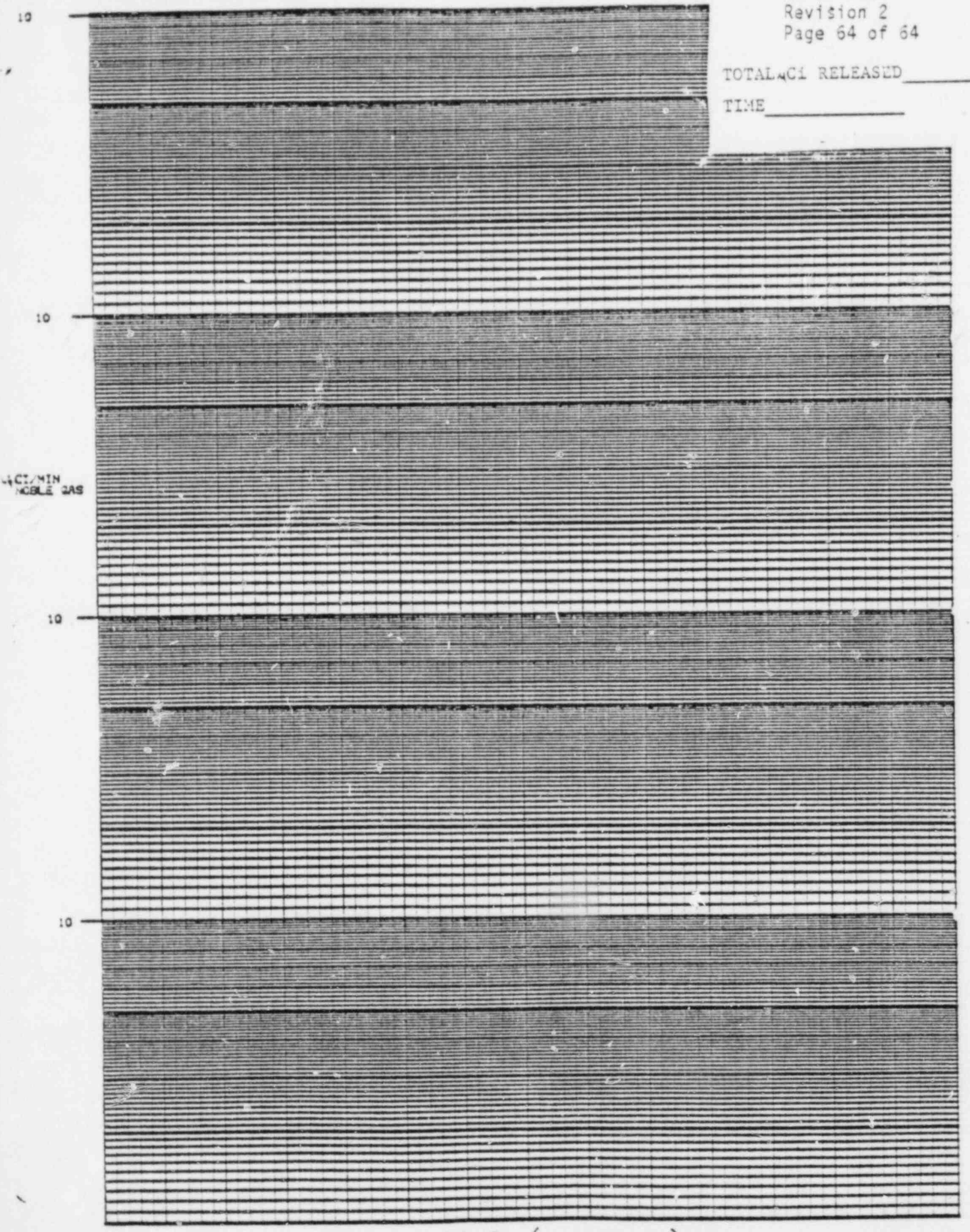


TIME (MILITARY)

RELEASE RATE TRENDING GRAPH
RELEASE RATE VS. TIME FOR NOBLE GAS

TOTAL μCi RELEASED_____

TIME_____



PROCEDURE COVER SHEET

PENNSYLVANIA POWER & LIGHT CO. SUSQUEHANNA STEAM ELECTRIC STATION	
INVENTORY, INSPECTION, OPERATIONAL TESTING, AND CALIBRATION OF EMERGENCY EQUIPMENT AND SUPPLIES	EP-IP-101 Revision 1 Page 1 of 51
Effective Date 10-14-83 Expiration Date 10-14-85 Revised Expiration Date _____	

CONTROLLED

Prepared by William F Tabar Date Aug 31, 83

Reviewed by Charles R. Wik Date 8/31/83

PORC Review Required Yes (✓) No ( )

Approved by S Dunlop Date 9/21/83
Section Head

PORC Meeting Number 83-211 Date 9-9-83

R Keiser Date 10-10-83
Superintendent of Plant

FORM AD-QA-101-1, Rev. 1 Page 1 of 1

TABLE OF CONTENTS

ATTACHMENTS

ATTACHMENTS (Cont'd)

1.0 PURPOSE

The purpose of this procedure is to provide a means of maintaining a complete inventory of required emergency equipment at all times.

2.0 SCOPE

This procedure defines the various inventories of emergency equipment, the division of responsibilities for maintaining the inventories with required record-keeping, and the method and frequency of review and confirmation of such established inventories.

3.0 REFERENCES

3.1 NUREG-0654/FEMA REP-1 Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants

3.2 10 CFR 50 Appendix E

3.3 SSES Emergency Plan

3.4 EP-IP-006 Search/Rescue/First Aid

3.5 EP-IP-012 On-Site Emergency Monitoring

3.6 EP-IP-013 Off-Site Emergency Monitoring Teams

3.7 EP-IP-016 Damage Control

3.8 AD-00-760 Performance Evaluation Program and Administrative Controls for Health Physics Instrumentation

3.9 Radiation Management Corporation Emergency Medical Assistance Program (as confirmed by 1/20/82 Letter of Agreement to Bruce D. Kenyon, Vice President-Nuclear Operations)

3.10 AD-00-540 Preventative Maintenance System

3.11 DDI-399 SSES Public Notification System: Test and Maintenance

3.12 SSES FSAR

3.13 EP-IP-102 Surveillance Testing of Emergency Telecommunications Equipment

4.0 RESPONSIBILITIES

4.1 Nuclear Support, under the direction of the Manager - Nuclear Support, is responsible for:

Overall inventory and maintenance of emergency equipment and supplies

4.2 Supervisor - Nuclear Emergency Planning (SNEP) under the direction of Manager - Nuclear Support, is responsible for:

Maintaining records of inspections, inventories, operational tests of emergency equipment and supplies as per Section 6.2 of this procedure.

NOTE: The SNEP has the authority to sign a PM waiver list for any emergency equipment.

NOTE: The SNEP will be responsible for filling out the PMIS PM Worklist after receiving these documented test results and returning the PM Worklist to the PMIS Center.

4.3 Distribution Department is responsible for:

Testing of Public Notification System as per section 6.3 of this procedure.

4.4 Environmental Group - Nuclear under the direction of the Environmental Group Supervisor - Nuclear is responsible for:

Inspection and inventory of the environmental monitoring kits as per section 6.4 of this procedure.

4.5 Nuclear Administration under the direction of the Manager-Nuclear Administration is responsible for:

4.5.1 Inventory of emergency equipment and supplies at the General Office Nuclear Emergency Support Center as per section 6.5.1 in this procedure.

4.5.2 Inventory of emergency equipment and supplies at General Office Engineering Support Center as per section 6.5.2 in this procedure.

4.6 Radiation Management Corporation (RMC) is responsible for:

The inventory review and maintenance of the radiation emergency supplies and equipment maintained at Berwick Hospital, Attachment E, and Geisinger Medical Center, Attachment F on a semi-annual basis as per the Emergency Medical Assistance Program Letter of Agreement.

4.7 Instrument and Controls (I&C), under the direction of the I&C Supervisor is responsible for:

Scheduling and calibrating all portable radiation survey and air sampling instruments as per section 6.7 in this procedure.

4.8 Health Physics (HP) - under the direction of the Health Physics Supervisor is responsible for:

Inspection, inventory and calibration of all Health Physics instruments and supplies as per section 6.8 in this procedure.

NOTE: The HP Supervisor has the authority to sign a PM waiver list for emergency equipment under the responsibility of Health Physics.

4.9 Plant Staff Emergency Planning Coordinator, under the direction of the Technical Supervisor is responsible for:

Inventory review of Technical Support Center equipment as per section 6.9 of this procedure.

NOTE: The Technical Supervisor has the authority to sign a PM Waiver list for any emergency equipment under the responsibility of the Shift Technical Advisor Group.

4.10 Safety and Health Consultant is responsible for:

Inventory review of emergency on-site search and rescue first-aid equipment and supplies as per section 6.10 of this procedure.

NOTE: The Safety and Health Consultant has the authority to sign a PM waiver list for emergency equipment under his responsibility.

4.11 Mechanical Maintenance under the direction of the Supervisor of Maintenance is responsible for:

Inventory review of emergency damage control equipment as per Section 6.11 of this procedure.

NOTE: The Supervisor of Maintenance has the authority to sign a PM waiver list for emergency equipment under the responsibility of Mechanical Maintenance.

5.0 DEFINITIONS

5.1 OSC - Operations Support Center

5.2 TSC - Technical Support Center

5.3 EOF - Emergency Operations Facility

5.4 SNEP - Supervisor - Nuclear Emergency Planning

5.5 Health Physics Instrumentation: Instrumentation as defined in the FSAR, section 12.5, may be categorized as follows:

5.5.1 Laboratory Counting Instrument: An instrument used to provide quantitative analysis of contamination and/or airborne activity, e.g. Ludlum 2218.

5.5.2 Portable Radiation Survey Instrument: An instrument which possesses a self-contained power supply, which allows it to operate independently of an external power source, e.g. Eberline E-520, E-140N, etc.

5.5.3 Portable Air Sampling Instrument: An instrument used with various filter media to sample air during predetermined intervals for particulate and gaseous radionuclides, e.g. Radeco Low Vol

5.6 Self Reading Dosimeter: A portable pencil shaped ion chamber which records integrated gamma radiation exposure that can be read at any time.

5.7 TLD: A thermoluminescent dosimeter which must be heated in a special instrument to retrieve exposure information.

5.8 Public Notification System - An early alert siren system consisting of 110 sirens ranging from 107 db to 125 db existing within the ten-mile Emergency Planning Zone (EPZ) around Susquehanna SES. Activation of the siren system is via radio control from Luzerne County Civil Defense and Columbia County Emergency Management Agency E.O.C.

5.9 Potassium Iodide (KI) tablets - A "thyroid blocking agent" which reduces the uptake of radioactive I-131 by the thyroid and therefore reduces the dose to the thyroid significantly.

5.10 PMIS - Plant Maintenance Information System is a computer based system intended to assist in the scheduling, tracking, and historical retention of work activities performed at Susquehanna SES.

5.11 PM Worklist - A method of preventative maintenance activity control which is a working document listing work activities or tasks to perform that do not affect system operability. This document is generated weekly and mailed from the PMIS center to each responsible section.

5.12 PM Waiver List - A weekly generated document which lists the preventative maintenance activities which have been waived in the last week. (unable to be performed due to extenuating circumstances). This list is completed by noting the reason a particular activity was waived and signed off by the responsible supervisor for that activity.

6.0 INSTRUCTIONS

6.1 Nuclear Support

6.1.1 Complete and submit all Preventative Maintenance Worklist Input forms, Form AD-00-540-5, necessary to support this procedure to PMIS.

6.1.2 Approve and submit all resulting Computer Approval Sheets necessary to support this procedure to PMIS.

6.1.3 Inventory and inspect all Emergency Operations Facility equipment and supplies every calendar quarter and after each use.

a. Inventory all Emergency Operations Facility equipment and supplies using Attachment A, "Emergency Operations Facility Equipment and Supplies".

Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

b. Complete and file Attachment A

c. Fill out the PMIS PM Worklist for Attachment A and return it to PMIS.

6.1.4 Inventory and Inspect all ten emergency off-site monitoring kits stored at the EOF every calendar quarter and after each use.

NOTE: An actual inventory does not have to be performed if the break way security seal is intact. An unbroken seal will serve to verify that the inventory is complete.

a. Inventory all emergency off-site monitoring kits using Attachment H "Radiation Emergency Off-Site Monitoring Equipment Kit". Complete a separate inventory sheet, Form EP-IP-101-8, for each kit and identify the kit number in the appropriate space provided on this form.

(1) Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

(2) Verify that the expiration date on the potassium iodide tablets is not past due and also that it will not expire to the next required inventory. If the expiration date is past due or will become past due prior to the next required inventory, replace the potassium iodide tablets with those which have not and will not expire prior to the next required inventory.

(3) Verify that instruments requiring calibration have been calibrated. If calibration has expired or will expire prior to the next required inventory, replace the instrument with a calibrated instrument which will not expire prior to the next required inventory. If the instrument with the expired calibration date is to be calibrated by the I&C group, deliver it to the I&C group to be recalibrated. Instruments to be recalibrated by the Health Physics group should be delivered to the Health Physics office.

b. Replace all non-rechargeable batteries in the portable radiation survey instruments with new batteries. Return replaced batteries to the Health Physics office.

c. Complete and forward Attachment H for each kit to the SNEP.

d. After sealing kits, fill out the PMIS PM Worklist for Attachment H and return it to the PMIS center.

6.1.5 Review completed inventory lists, Attachments A thru O and ensure identified deficiencies are corrected in a timely manner.

6.1.6 Fill out the PMIS PM Worklist for Attachments A,E,F and H and submit them to PMIS.

6.1.7 Ensure performance of the operational testing of the Public Notification System as required by 10 CFR 50 Appendix E and DDI-399, SSES Public Notification System: Test and Maintenance.

6.2 Distribution Department

6.2.1 Verify operation of the Public Notification System's 110 sirens according to the following schedule as required by 10 CFR 50 Appendix E and DDI-399 SSES Public Notification System: Test and Maintenance

a. Monthly: Perform a silent radio test, to show the siren controls were energized.

b. Quarterly: Perform a growl test. Start the siren up and immediately shut it down. The siren will not reach its peak sound level in this test.

c. Annually: Fully activate the sirens to verify that they reach peak sound production. This will enable a survey to be performed to determine the actual sound coverage throughout the 10 mile EPZ surrounding the plant.

6.2.2 Document all tests performed with results and submit these documents to the SNEP and to the Document Control Center for permanent record.

6.3 Environmental Group-Nuclear

Inventory and inspect all environmental monitoring kits stored at the Biological Research Laboratory every calendar quarter and after each use.

6.3.1 Inventory all Environmental Monitoring Kits using Attachment B, "Environmental Monitoring Kits". Complete a separate inventory sheet, Form EP-IP-101-2, for each kit and identify the kit number in the appropriate space provided on this form.

Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

6.3.2 Complete and forward Attachment B for each kit to the SNEP.

6.3.3 Fill out the PMIS PM Worklist for Attachment B and return it to PMIS.

6.4 Nuclear Administration

6.4.1 Inventory and inspect all General Office Nuclear Emergency Support Center Emergency Equipment and Supplies every calendar quarter and after each use.

a. Inventory all General Office Nuclear Emergency Support Center Emergency Equipment and Supplies using Attachment C, "General Office Nuclear Emergency Support Center Emergency Equipment and Supplies"

Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

b. Complete and forward Attachment C to the SNEP.

c. Fill out the PMIS PM Worklist for Attachment C and return it to PMIS.

6.4.2 Inventory and inspect all General Office Engineering Support Center Emergency Equipment and Supplies every calendar quarter and after each use.

a. Inventory all General Office Engineering Support Center Emergency Equipment and Supplies using Attachment D, "General Office Engineering Support Center Emergency Equipment and Supplies".

Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

b. Complete and forward Attachment D to the SNEP.

c. Fill out the PMIS PM Worklist for Attachment D and return it to PMIS.

6.5 Radiation Management Corporation

6.5.1 Inventory and inspect all Berwick Hospital radiation emergency equipment and supplies excluding survey instruments and dosimetry semi-annually and after each use.

a. Inventory all Berwick Hospital radiation emergency equipment and supplies excluding survey instruments and dosimetry using Attachment E, "Berwick Hospital Radiation Emergency Equipment and Supplies."

Visually inspect all equipment excluding survey instruments and dosimetry and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

b. Complete and forward Attachment E to the SNEP.

6.5.2 Inventory and inspect all Geisinger Medical Center radiation emergency equipment and supplies excluding survey instruments and dosimetry semi-annually and after each use.

a. Inventory all Geisinger Medical Center radiation emergency equipment and supplies using Attach F, "Geisinger Medical Center Radiation Emergency Equipment and Supplies"

Visually inspect all equipment excluding survey instruments and dosimetry and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

b. Complete and forward Attachment F to the SNEP.

6.6 Instrument and Controls

6.6.1 Schedule all portable radiation survey instruments included in the inventory lists Attachments E,F,G,H,I,J,K,L for calibration on a quarterly basis.

6.6.2 Calibrate all portable radiation survey instruments included in the inventory lists Attachments E,F,G,H,I,J,K,L in accordance with AD-QA-620, "Portable Survey Equipment Calibration Program".

6.6.3 Document all calibrations performed by I&C with results and submit these documents to the Document Control Center to be entered into the microfilm system for permanent record.

6.7 Health Physics

6.7.1 Inventory station emergency Potasium iodide (KI) supplies stored in the Health Physics Emergency Equipment Room every calendar quarter to ensure an adequate stock is available and that expiration dates are current.

6.7.2 Inventory and Inspect all Health Physics Van radiation emergency monitoring equipment every calendar quarter and after each use.

a. Inventory all Health Physics Van emergency equipment using Attachment G "Health Physics Van Radiation Emergency Monitoring Equipment"

(1) Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

(2) Verify that the expiration date on the potassium iodide tablets is not past due and also that it will not expire prior to the next required inventory. If the expiration date is past due or will expire prior to the next required inventory, replace the potassium iodide tablets with those which have not and will not expire prior to the next required inventory.

(3) Verify that instruments requiring calibration have been calibrated. If calibration has expired or will expire prior to the next required inventory, replace the instrument with a calibrated instrument which will not expire prior to the next required inventory. If the instrument with the expired calibration date is to be calibrated by the I&C group, deliver it to the I&C group to be recalibrated. Instruments to be recalibrated by the Health Physics group should be delivered to the Health Physics office.

b. Replace all non-rechargeable batteries in the portable survey instruments with new batteries. Return replaced batteries to the Health Physics office.

c. Complete and forward Attachment G to the SNEP.

d. After inventory, fill out the PMIS PM Worklist for Attachment G and return it to PMIS.

6.7.3 Inventory and inspect all ambulance emergency kit equipment stored at the North Gatehouse every calendar quarter and after each use.

NOTE: An actual inventory does not have to be performed if the break away security seal is still intact. An unbroken seal will serve to verify that the inventory is complete. Survey instruments must be calibrated every quarter however.

a. Inventory all ambulance radiation emergency equipment using Attachment I, "Ambulance Emergency Equipment Kit"

(1) Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

(2) Verify that instruments requiring calibration have been calibrated. If calibration has expired or will expire prior to the next required inventory, replace the instrument with a calibrated instrument which will not expire prior to the next required inventory. If the instrument with the expired calibration date is to be calibrated by the I&C group, deliver it to the I&C group to be recalibrated. Instruments to be recalibrated by the Health Physics group should be delivered to the Health Physics office.

b. Replace all TLD badges with new TLD badges and deliver the replaced TLD badges to the dosimetry group

c. Replace all non-rechargeable batteries in the portable survey instruments with new batteries. Return replaced batteries to the Health Physics office.

d. After inventory, seal the ambulance kits with a break away security seal so that they cannot be opened without breaking the seal.

e. Complete and forward Attachment I to the SNEP.

f. After sealing the kits, fill out the PMIS PM Worklist for Attachment I and return it to PMIS.

6.7.4 Inventory and inspect all Control Room equipment located in the Operations Support Center every calendar quarter and after each use.

a. Inventory all Control Room equipment located in the Operations Support Center using Attachment J, "Control Room Equipment".

(1) Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note, why it was replaced.

(2) Verify that instruments requiring calibration have been calibrated. If calibration has expired or will expire prior to the next required inventory, replace the instrument with a calibrated instrument which will not expire prior to the next required inventory. If the instrument with the expired calibration date is to be calibrated by the I&C group, deliver it to the I&C group to be recalibrated. Instruments to be recalibrated by the Health Physics group should be delivered to the Health Physics office.

(3) Verify that the expiration date on the potassium iodide tablets is not past due and also that it will not expire prior to the next required inventory. If the expiration date is past due or will become past due prior to the next required inventory, replace the potassium iodide tablets with those which have not and will not expire prior to the next required inventory.

b. Replace all non-rechargeable batteries in the portable survey instruments with new patteries. Return replaced batteries to the Health Physics office.

c. Complete and forward Attachment J to the SNEP.

d. After inventory fill out the PMIS PM Worklist for Attachment J and return it to PMIS.

6.7.5 Inventory and inspect all station decontamination area equipment and supplies every calendar quarter and after each use. Inventory each of the following decontamination stations; (1) Rx Bld Elevation 818', (2) Rx Bdg Elevation 719' NW Corner, (3) Rx Bld Elevation 719' SE Corner, (4) Control Structure Elevation 656', (5) Radwaste Bld Elevation 691', (6) Radwaste Bld Elevation 646' East, (7) Radwaste Bld Elevation 646' West

a. Inventory all station decontamination area emergency equipment using Attachment K, "Station Decontamination Area Equipment". Complete a separate inventory sheet, Form EP-IP-101-11, for each station and identify the location and elevation for each station in the appropriate space provided on this form.

(1) Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note, why it was replaced.

(2) Verify that the expiration dates on the decontamination chemicals are not past due and also that they will not expire prior to the next required inventory. If the expiration date is past due or will become past due prior to the next required inventory, replace the chemicals with fresh chemicals which will not expire prior to the next required inventory.

(3) Verify that instruments requiring calibration have been calibrated. If calibration has expired or will expire prior to the next required inventory, replace the instrument with a calibrated instrument which will not expire prior to the next required inventory. If the instrument with the expired calibration date is to be calibrated by the I&C group, deliver it to the I&C group to be recalibrated. Instruments to be recalibrated by the Health Physics group should be delivered to the Health Physics office.

b. Complete and forward Attachment K for each decontamination station to the SNEP.

c. After inventory fill out the PMIS PM Worklist for Attachment K and return it to PMIS.

6.7.6 Inventory and inspect all Emergency Operations Facility decontamination area and Health Physics equipment and supplies every calendar quarter and after each use.

a. Inventory all EOF radiation emergency decontamination area and Health Physics supplies using Attachment L, "Emergency Operations Facility Decontamination Area and Health Physics Supplies"

(1) Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

(2) Verify that the expiration date on the potassium iodide tablets is not past due and also that it will not expire prior to the next required inventory. If the expiration date is past due or will become past due prior to the next required inventory, replace the potassium iodide tablets with those which have not and will not expire prior to the next required inventory.

(3) Verify that the expiration dates on the decontamination chemicals are not past due and also that they will not expire prior to the next required inventory. If the expiration date is past due or will become past due prior to the next required inventory, replace the chemicals with fresh chemicals which will not expire prior to the next required inventory.

(4) Verify that instruments requiring calibration have been calibrated. If calibration has expired or will expire prior to the next required inventory, replace the instrument with a calibrated instrument which will not expire prior to the next required inventory. If the instrument with the expired calibration date is to be calibrated by the I&C group, deliver it to the I&C group to be recalibrated. Instruments to be recalibrated by the Health Physics group should be delivered to the Health Physics office.

b. Complete and forward Attachment L to the SNEP

c. After inventory fill out the PMIS PM Worklist for Attachment L and return it to PMIS.

6.7.7 Inventory and inspect all Berwick Hospital radiation emergency equipment and supplies semi-annually and after each use. RMC and the Health Physics section will alternate quarterly inventory and inspection responsibilities (Health Physics instruments must be inventoried every quarter by Health Physics).

a. Inventory all Berwick Hospital radiation emergency equipment and supplies using Attachment E, "Berwick Hospital Radiation Emergency Equipment and Supplies"

(1) Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

(2) Verify that instruments requiring calibration have been calibrated. If calibration has expired or will expire prior to the next required inventory, replace the instrument with a calibrated instrument which will not expire prior to the next required inventory. If the instrument with the expired calibration date is to be calibrated by the I&C group, deliver it to the I&C group to be recalibrated. Instruments to be recalibrated by the Health Physics group should be delivered to the Health Physics office.

b. Replace all TLD badges with new TLD badges and deliver the replaced TLD badges to the dosimetry group.

c. Replace all non-rechargeable batteries in the portable survey instruments with new batteries. Return replaced batteries to the Health Physics office.

d. Complete and forward Attachment E to the SNEP

e. After inventory fill out the PMIS PM Worklist for Attachment E and return it to PMIS.

6.7.8 Inventory and inspect all Geisinger Medical Center radiation emergency equipment and supplies every calendar quarter and after each use. RMC and the Health Physics group will alternate quarterly inventory and inspection responsibilities.

a. Inventory all Geisinger Medical Center radiation emergency equipment and supplies using Attachment F, "Geisinger Medical Center Radiation Emergency Equipment and Supplies"

(1) Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

(2) Verify that instruments requiring calibration have been calibrated. If calibration has expired or will expire prior to the next required inventory, replace the instrument with a calibrated instrument which will not expire prior to the next required inventory. If the instrument with the expired calibration date is to be calibrated by the I&C group, deliver it to the I&C group to be recalibrated. Instruments to be recalibrated by the Health Physics group should be delivered to the Health Physics office.

b. Replace all TLD badges with new TLD badges and deliver the replaced TLD badges to the dosimetry group.

c. Replace all non-rechargeable batteries in the portable survey instruments with new batteries. Return replaced batteries to the Health Physics office.

d. Complete and forward Attachment F to the SNEP

e. After inventory fill out the PMIS PM Worklist for Attachment F and return it to PMIS.

6.8 Plant Staff Emergency Planning Coordinator

Inventory and inspect all Technical Support Center equipment every calendar quarter and after each use.

6.8.1 Inventory all TSC equipment using Attachment M, "Technical Support Center Equipment"

Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

6.8.2 Complete and forward Attachment M to the SNEP

6.8.3 After inventory fill out the PMIS PM Worklist for Attachment M and return it to PMIS.

6.9 Safety and Health Consultant

Inventory and inspect all emergency on-site search and rescue first-aid equipment located as indicated on Attachment N every calendar quarter and after each use:

6.9.1 Inventory all radiation emergency on-site first-aid equipment using Attachment N "Emergency On-Site Search and Rescue First-Aid Equipment"

Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

6.9.2 Complete and forward Attachment N to the SNEP.

6.9.3 After inventory fill out the PMIS PM Worklist for Attachment N and return it to PMIS.

6.10 Mechanical Maintenance

Inventory and inspect all damage control equipment stored outside the Health Physics Emergency Equipment Room in the control structure, Elevation 656', every calendar quarter and after each use.

NOTE: An actual inventory does not have to be performed if the break away security seal is intact. An unbroken seal will serve to verify that the inventory is complete.

6.10.1 Inventory all damage control equipment using Attachment O, "Damage Control Equipment Storage Box"

Visually inspect all equipment and replace any equipment which shows deterioration or abuse. Note any item replaced in required column and note why it was replaced.

6.10.2 Complete and forward Attachment O to the SNEP

6.10.3 After inventory, seal equipment box with a break away security seal so that it cannot be opened without breaking the seal

6.10.4 After sealing equipment box, fill out the PMIS PM Worklist for Attachment O and return it to PMIS.

7.0 RECORDS

7.1 The PMIS as outlined in AD-00-540; "Preventative Maintenance System" will provide the method of controlling overall documentation of inventories, inspections and operational tests as required by this procedure.

7.1.1 The responsible supervisor of each designated group will ensure the weekly completion of any PMIS PM Worklists he is responsible for and submit them to the PMIS center (except in cases where this responsibility has been given to the SNEP).

7.1.2 Information including inspection date, completion code, and employee performing the task from the PM Worklists will be entered into the computer system by PMIS personnel. This will update the PMIS master file automatically and the computer will then schedule the next date for the required activity.

7.1.3 PMIS will submit all PM Worklists to the Document Control Center (DCC) to be entered into the microfilm system for permanent record.

7.2 Additionally, the SNEP will receive records of all inventories, inspections, and operational tests of emergency equipment and supplies from the various responsible groups. The SNEP will review these records to ensure that identified deficiencies are corrected in a timely manner.

Inventory Date _____
Initials _____

Emergency Operations Facility Equipment (excluding H.P. equipment)

Equipment	Quantity	Replaced/ Comments (X if Present)
Documents		
Plant Technical Specifications	1	
Operating Procedures Manual	1 set	
Emergency Operating Procedures Manual	1	
Final Safety Analysis Report	1 set	
Emergency Plan	1	
Emergency Plan Implementing Procedures	1	
Current Emergency Plans for:		
Commonwealth of Pennsylvania	1	
Luzerne County Civil Defense	1	
Columbia County Emergency Management Agency	1	
Off-site Population Distribution and Evacuation Plans	1	
Dose Calculation Manual	1	
Emergency Phone Directory	10	
Emergency Planning Map with Off-site Monitoring Locations	1	
Map Overlays for Dose Projection	1 set	
Rad Dose Computer	1	
Calculators	3	
Extension Cords	3	
Document Control Area		
35 mm Microfilm Reader/Printer	1	
16 mm Page Search Microfilm Reader/Printer	1	
Microfiche Dry Reader/Printer	1	
Microfiche Reader	2	
Microfilm Storage Cabinet	1	
Microfiche Storage Cabinet	1	
Aperature Card Storage Cabinets	2	

Continued...

Inventory Date _ _____
Initials _____

Emergency Operations Facility Equipment (excluding H.P. equipment)

Equipment	Quantity	Replaced/ Comments (X if Present)
Clerical Supplies		
FACSIMILE	2	_____
Copy Machines	2	_____
Typewriters	2	_____
Whiteboard erasers	10	_____
Dry Erase Markers		
Black	20	_____
Red	20	_____
Green	20	_____
Clipboard	12	_____
Pads of Paper (8 1/2" x 11")	40	_____
Pencils	60	_____
Pens	60	_____
Magic Marker		
Black	30	_____
Red	30	_____
Highlighters		
Yellow	15	_____
Pink	15	_____
Grease Pencils		
Black	10	_____
Red	10	_____
Green	10	_____
Eraser Cloths for Grease Pencils	10	_____
Scissors	5	_____
Pencil Sharpener	5	_____
3 Hole Punch	2	_____
Scotch Tape Dispenser with Tape	5	_____
Ruler, 12"	10	_____
Paper Clips	5 Boxes	_____
Butterfly Clips	5 Boxes	_____
Thumb Tacks	5 Boxes	_____
Rubber Bands	5 Boxes	_____
Stapler	5	_____
Staples	5 Boxes	_____
Fluorescent Worklight	5	_____
Flashlight	5	_____
First Aid Kit	1	_____

Continued...

Inventory Date _____
Initials _____

Emergency Operations Facility Equipment (excluding H.P. equipment)

Equipment	Quantity	Replaced/ Comments (X if Present)
Action Step Folders:		
Recovery Manager	1	_____
Site Support Manager	1	_____
Technical Support Manager	1	_____
Radiological Support Manager	1	_____
Communications Coordinator-EOF	1	_____
Emergency Forms:		
EP-IP-013 DATA Sheets	100	_____
Incident Form EP-IP-002-1	100	_____
Radiological Assessment Form EP-IP-002-2	100	_____

Reviewed by _____
SNEP

Kit No._____
Inventory Date_____
Initials_____

Radiation Emergency Environmental Sample Kit

Equipment	Replaced/ Comments (X if present)
List of Sample Collection Locations and Map	
Sample Collection Data Sheets	
Sample Labels (10)	
Disposal Gloves (4 pair)	
Ziploc Bags (20 - 1 gallon size)	
Large Plastic Bags (2)ions	
Sample Containers (2 - 2 gallon size)	
Flashlight with Extra Batteries	
Small Notebook and Clipboard	
Procedures for Emergency Environmental Sampling	
Plastic Beaker (1000 ml)	
Air Filter Paper (1 sheet)	
Air Filter Cartridge	
TLD Container	
Pliers	
Light Wire	
SRD's 0-200 mr (Two)	
SRD's 0-100 R (Two)	
Rain Suits (Two)	

Reviewed by _____ Reviewed by _____
Environmental Group Supv.-Nuc. SNEP

Inventory Date _____ Initials _____

General Office Nuclear Emergency Support Center Emergency Equipment and Supplies

Equipment	Quantity	Replaced/Comments (X if Present)
Documents		
Emergency Plan	1	_____
Emergency Plan Implementing Procedures	1	_____
General Office Support Managers Book	1	_____
INPO Emergency Resources Manual	1	_____
Two-Way Radio Operators Manual	2	_____
Shickshinny Telephone Directories	2	_____
Allentown Telephone Directories	4	_____
INPO Directories	3	_____
Inter-Company Directories (PP&L)	4	_____
Emergency Telephone Listing Notebook	1	_____
Emergency Resources Manual	1	_____
Basic SES Systems Book	1	_____
Tape Recording Equipment		
Norelco Tape Recorder with microphone	1	_____
Norelco Pocket Tape Recorder with microphone	2	_____
Tapes for Pocket Tape Recorder	12	_____
Extra Batteries for Pocket Tape Recorder	4	_____
Craig Cassette Recorder and tele-Recorder 150	1	_____
Portfolio Folders		
Technical Update	1	_____
Conference Call Tape	1	_____
CMC Release	1	_____
Press Release	1	_____
Unmarked	2	_____
Magnetic Signs	8	_____
Emergency Drill Release Forms	50	_____
Pads of Rediforms SH555 for Log	3	_____
Pads of Paper	4	_____
In and Out Boxes	4	_____
Stapler	1	_____
3 Hole Punch	1	_____
Inventory List of Supplies	20	_____
Ruler	1	_____
Pens and Pencils	10 each	_____
Scissors	1	_____
Scotch tape dispenser with tape	1	_____

Reviewed by _____ Mgr.-Nuc. Admin

Reviewed by _____ SNEP

Inventory Date _____
Initials _____

General Office Engineering Support Center Emergency Equipment and Supplies

Equipment	Quantity	Replaced/ Comments (✓ if Present)
Documents		
Plant Technical Specifications	1	_____
Final Safety Analysis Report	1 set	_____
System Description Manuals	1 set	_____
Steam Tables	1 set	_____
Misc. Equipment		
Bookcase	1	_____
Tackboard	2	_____
Thumbtacks	2 Boxes	_____
Whiteboard	4	_____
Whiteboard erasers	5	_____
Dry Erase Markers	10	_____

Reviewed by _____
Mgr.-Nuc. Admin.

Reviewed by _____
SNEP

Inventory Date _____
Initials _____

Berwick Hospital Radiation Emergency Equipment and Supplies

Equipment	Quantity	Responsible Group	Replaced/ Comments (X if present)
Eberline RM-14 W/HP 210 probe	1	HP	_____
Eberline E-520 GM instrument	1	HP	_____
Eberline RO-2A ion chamber	1	HP	_____
Self Reading Dosimeters, 0-200 mR	10	HP	_____
Thermoluminescent Dosimeters, badge type	10	HP	_____
Thermoluminescent Dosimeters, ring type	10	HP	_____
Dosimeter Charger	1	HP/RMC*	_____
Decontamination Table Top	1	HP/RMC	_____
Lead Container, high activity samples	1	HP/RMC	_____
Decontamination Kit	1	HP/RMC	_____
Sample-Taking Kit	1	HP/RMC	_____
Hose;low pressure w/shower head and valve	1	HP/RMC	_____
Protective Clothing Packs	12	HP/RMC	_____
Masking Tape, 2" roll	10	HP/RMC	_____
Set of radiation signs and ribbon	1	HP/RMC	_____

Continued...

*Quarterly inventory to be performed. Responsibility for inventory to rotate every quarter between Radiation Management Corporation and the Health Physics group

Equipment	Quantity	Responsible Group	Replaced/ Comments (X if present)
Batteries, for instruments	as sufficient	HP/RMC*	_____
Misc. Plastic bags	as sufficient	HP/RMC	_____
Step-off pads	as sufficient	HP/RMC	_____
Stanchions	as sufficient	HP/RMC	_____
Herculite-white, green, and yellow	as sufficient	HP/RMC	_____

Reviewed by _____ Reviewed by _____
H.P. Supv. or RMC SNEP

*Quarterly inventory to be performed. Responsibility for inventory to rotate every quarter between Radiation Management Corporation and the Health Physics group

Inventory Date _____
Initials _____

Geisinger Medical Center Radiation Emergency Equipment and Supplies

Equipment	Quantity	Responsible Group	Replaced/ Comments (X if present)
Eberline RM-14 W/HP 210 probe	1	HP	_____
Eberline E-520 GM instrument	1	HP	_____
Eberline RO-2A ion chamber	1	HP	_____
Self Reading Dosimeters, 0-200 mR	10	HP	_____
Thermoluminescent Dosimeters, badge type	10	HP	_____
Thermoluminescent Dosimeters, ring type	10	HP	_____
Dosimeter Charger	1	HP/RMC*	_____
Decontamination Table Top	1	HP/RMC	_____
Lead Container, high activity samples	1	HP/RMC	_____
Decontamination Kit	1	HP/RMC	_____
Sample-Taking Kit	1	HP/RMC	_____
Hose; low pressure w/shower head and valve	1	HP/RMC	_____
Protective Clothing Packs	12	HP/RMC	_____
Masking Tape, 2" roll	10	HP/RMC	_____

Continued...

*Quarterly inventory to be performed. Responsibility for inventory to rotate every quarter between Radiation Management Corporation and the Health Physics group

Equipment	Quantity	Responsible Group	Replaced/ Comments (X if present)
Set of radiation signs and ribbon	1	HP/RMC*	_____
Batteries, for instruments	as sufficient	HP/RMC	_____
Misc. Plastic bags	as sufficient	HP/RMC	_____
Step-off pads	as sufficient	HP/RMC	_____
Stanchions	as sufficient	HP/RMC	_____
Herculite-white, green, and yellow	as sufficient	HP/RMC	_____

Reviewed by _____
H.P. Supv. or RMC

Reviewed by _____
SNEP

*Quarterly inventory to be performed. Responsibility for inventory to rotate every quarter between Radiation Management Corporation and the Health Physics group

Inventory Date _____
Initials _____

Health Physics Van Radiation Emergency Monitoring Equipment

Equipment	Quantity	Replaced/ Comments (X if present)
*Eberline E-520 with SK-1 speaker	1	_____
*Portable Frisker with probe (Eberline RM-14, E-140N, or Victoreen 425)	1	_____
*Ion Chamber, High range (Victoreen panoramic or Eberline RO-2A)	1	_____
*Ludlum 2218 dual channel analyzer, detector, & power cord	1 set	_____
Radeco Low Volume Air Sampler with head (AC powered)	1	_____
Radeco Low Volume Air Sampler with DC power plug	1	_____
Spare Frisker Cable	1	_____
DC to AC Inverter	1	_____
VHF mobile base station radio	1	_____
**VHF portable radio, charger and spare battery	1	_____
Full face respirator mask	2	_____
Iodine canister	2	_____
Vial of Potassium Iodide Tablets	1	_____

Continued...

*Located in emergency radiation detection equipment box stored in Health Physics Emergency Equipment Room
**Located in Health Physics Office

Equipment	Quantity	Replaced/ Comments (X if present)
Self Reading Dosimeter, 0-5R	2	
Dosimeter Charger	1	
Set of Anti-Contamination Clothing	2	
Protective gloves, cloth and plastic	20	
Copy of Emergency Plan	1	
Copy of EP-IP-012 On-Site Emergency Monitoring	2	
Copy of EP-IP-013 Off-Site Emergency Monitoring	2	
Extra Data Sheets	50	
Pen	2	
Pencil	2	
Magic Marker	2	
Clip board	1	
Calculator	1	
Emergency Planning Map	1	
Check source	1	
Silver Zeolite cartridges	10	
Particulate Filters, box	1	
Tweezers	1	
Stopwatch	1	
Sample bottles	10	
Duct Tape, roll	1	

Continued...

Equipment	Quantity	Replaced/ Comments (X if present)
Radioactive Material Stickers, roll	1	_____
Labels for air samples	10	_____
Masslin Cloths	10	_____
Whatman No. 2 filter papers, box	1	_____
Plastic bags, 3 sizes (4" x 6", 8" x 8", 12" x 15")	20 each	_____
Extension cord	1	_____
Work light, fluorescent	1	_____
Flashlight	1	_____
Utility knife	1	_____
First Aid Kit	1	_____
Spare batteries		
9 volt battery	6	_____
AA cell battery	2	_____
D cell battery	2	_____
Spare fuses for Air sampler	2	_____
Step off pads	2	_____
Rad ribbon and signs	as sufficient	_____
Barrier rope with flags	as sufficient	_____

Reviewed by _____ Reviewed by _____
H.P. Supv. SNEP

Kit No. _____
Inventory Date_____
Initials_____

Radiation Emergency Off-Site Monitoring Equipment Kit

Equipment	Quantity	Replaced/ Comments (X if present)
Clipboard	1	_____
Pad of Paper	1	_____
Magic Marker	1	_____
Pens	2	_____
Pencils	2	_____
Emergency Planning Map	1	_____
Grid Coordinate Map	1	_____
Copy of EP-IP-013, Off-site Emergency Monitoring	1	_____
Off-site Monitoring Data Sheets	50	_____
Stopwatch	1	_____
Tweezers	1	_____
Eberline RO-2	1	_____
Low Volume Air Sampler	1	_____
Air Sampler Head	1	_____
Ludlum 2218 dual channel analyzer, detector, and power cord	1 set	_____
Dosimeter, 0-500 mR or 0-200 mR	2	_____
Dosimeter, 0-5 R	2	_____

Continued...

Equipment	Quantity	Replaced/ Comments (X if present)
Dosimeter Charger	1	
Vial of Potassium Iodide	2	
Check source	1	
Radioactive Material Stickers, roll	1	
Particulate Filters, box	1	
Silver Zeolite Cartridges	10	
Disposable Plastic Gloves	20	
Plastic sample bags-approximate sizes:		
4" x 6" plastic bags	20	
8" x 8" plastic bags	40	
12" x 15" plastic bags	10	
Calculator	1	
Extension cord	1	
Worklight, Fluorescent	1	
Flashlight	1	
Spare Battery and Fuse Kit		
9 volt battery	4	
D cell battery	7	
Fuses for Air Sampler	2	
Masking tape, roll	2	
Labels, air sample bags	25	
Screw Driver	1	
Rain Suits	2	

Reviewed by _____ Reviewed by _____
H.P. Supv. SNEP

Inventory Date _____
Initials _____

Ambulance Emergency Equipment Kit

Equipment	Quantity	Replaced/ Comments (X if present)
Plastic sheeting, 8' x 20'	1	_____
Duct tape, rolls	2	_____
Misc. Plastic bags	10	_____
Set of anti-contamination clothing	6	_____
Extra plastic gloves	20	_____
Extra plastic shoe covers	20	_____
Self Reading Dosimeter, 0-200 mR	6	_____
Dosimeter charger	1	_____
Thermoluminescent dosimeter badges	6	_____
Portable Frisker, Eberline E140-N	1	_____

Reviewed by _____ Reviewed by _____
H.P. Supv. SNEP

Inventory Date _____
Initials _____

Control Room Equipment

Equipment	Quantity	Replaced/ Comments (X if present)
Portable frisker with probe	2	_____
Low Volume Air Sampler with Head	1	_____
High Volume Air Sampler with Head	1	_____
Ion Chamber survey instrument (RO-2A)	1	_____
GM Survey instrument (teletector)	1	_____
Spare frisker cable	2	_____
Spare frisker probe	2	_____
Box of particulate filter paper (low vol)	1	_____
Box of particulate filter paper (high vol)	1	_____
Silver Zeolite Cartridges	20	_____
Spare Batteries and fuses		
9 volt	6	_____
C cell	4	_____
Fuses for Air Sampler	2	_____
D cell	4	_____
Portable Worklight	2	_____
Extension Cord	2	_____
Dosimeter Charger	1	_____
Self Reading Dosimeters		
0-1 R	12	_____
0-50 R	12	_____

Continued...

Equipment	Quantity	Replaced/ Comments (X if present)
Vials of Potassium Iodide Tables	12	
Anti-Contamination Clothing		
Coveralls	1 case	
Plastic gloves	1 box	
Shoe Covers	1 case	
Cotton glove liners	6 dozen	
Surgeon Caps	12	
Full face Respirator	12	
Iodine Filter Canisters	12	
SCBA	6	
Spare SCBA tanks	6	
Emergency Plan	1	
Emergency Plan Implementing Procedures	1 set	
Emergency Planning Map with off-site sampling locations	1	
Map Overlays for Dose Projection	1 set	
On-site Monitoring Locations Map	1	
Rad Dose Computer	1	
15 minute escape device	12	
First Aid Kit	1	
Keys to Health Physics Van (key locker)	1 set	
Emergency Plan keys (key locker)	2 sets	

Reviewed by _____ Reviewed by _____
H.P. Supv. SNEP

Location (Building and elevation) _____
Inventory Date _____
Initials _____

Station Decontamination Area Equipment

Equipment	Quantity	Replaced/ Comments (X if present)
Copy of HP-TP-624, "Personnel Decontamination"	1	_____
Personnel Contamination Reports Forms	20	_____
Disposable Gloves	1 box	_____
Shoe Covers paper	24	_____
Cotton gloves	2doz.	_____
Coveralls (Disposable)	12	_____
Decontamination Soap	1 Bottle	_____
Lotion Skin Cleaner	1 Bottle	_____
Cotton tipped swabs	100	_____
Hand Brushes	2	_____
Decontamination chemicals		
Titanium Dioxide	1 container	_____
4% Potassium permanganate	1 Bottle	_____
4% Sodium bisulfate	1 Bottle	_____
Hand Cream	1 Bottle	_____
Disposable Razors	4	_____
Scissors	1	_____
Tweezers	1	_____

Continued...

Equipment	Quantity	Replaced/ Comments (X if present)
Paper Towels	1 Box	_____
Masking Tape	1 Roll	_____
Assorted Sponges	4	_____
Frisker	1	_____
Spare Frisker probe	1	_____
Spare Frisker cable	2	_____

Reviewed by _____ H.P. Supv.

Reviewed by _____ SNEP

Inventory Date _____
Initials _____

Emergency Operations Facility Decontamination Area
and Health Physics Supplies

Decontamination Area Equipment	Quantity	Replaced/ Comments (X if present)
Copy of HP-TP-624, "Personnel Decontamination"	1	_____
Personnel Contamination Report Forms	20	_____
Disposable Gloves	1 Box	_____
Shoe Covers paper	24	_____
Cotton gloves	2doz.	_____
Coveralls (Disposable)	12	_____
Decontamination Soap	1 Bottle	_____
Lotion Skin Cleaner	1 Bottle	_____
Cotton tipped swabs	100	_____
Hand Brushes	6	_____
Decontamination chemicals		
Titanium Dioxide	1 container	_____
4% Potassium permanganate	1 Bottle	_____
4% Sodium bisulfate	1 Bottle	_____
Hand Cream	1 Bottle	_____
Disposable Razors	4	_____
Scissors	1	_____
Tweezers	1	_____

Continued...

Decontamination Area Equipment	Quantity	Replaced/ Comments (X if present)
Paper Towels	1 Box	
Masslin Cloths	2 Boxes	
Masking Tape, 2" roll	1 Roll	
Assorted sponges	4	
Other Health Physics Supplies		
Ludlum Dual Channel Analyzer with detector	2	
Portable frisker with probe	5	
Spare frisker probe	10	
Spare frisker cable	24	
Ion Chamber Survey Instrument	2	
GM Survey Instrument	5	
Low Volume Air Sampler	5	
Portable filter papers	12 Boxes	
Silver Zeolite Cartridges	100	
Potassium Iodide tablets	100 Vials	
Self Reading Dosimeters		
0-200 mR	100	
0-5 R	50	
0-100 R	40	

Continued...

Decontamination Area Equipment	Quantity	Replaced/ Comments (X if present)
Dosimeter Charger	5	
Anti-Contamination Clothing		
Coveralls (Disposable)	12 cases	
Plastic gloves	12 Boxes	
Shoe covers	12 cases	
Cotton Glove Liners	12 cases	
Disposable caps	2 cases	
Plastic suits	2 cases	
Full face respirators	50	
Respirator filters		
Particulate canister	100	
Iodine canister	50	
SCBA	2	
Spare SCBA Tank	2	
Smear Papers	3 Boxes	
Stopwatch	1	
Survey forms	100	
Pocket Knife	1	
Spray Paint for Area Marking (Magenta)	5 cans	
Radiological Signs	20	
Assorted Inserts for signs	20 each	
"Radioactive Material" Stickers	3 rolls	
"Radioactive Material" Tape	5 rolls	
Barrier Rope with Stanchions	1 roll	
Masking Tape (2" roll)	25 rolls	

Continued...

Decontamination Area Equipment	Quantity	Replaced/ Comments (X if present)
Duct Tape (2" roll)	5 rolls	_____
Plastic Sheeting	20' x 30'	_____
Poly Bags	25	_____
Spare Batteries		
9 volt	20	_____
D cell	20	_____
Spare fuses for air sampler	20	_____

Reviewed by _____ H.P. Supv.

Reviewed by _____ SNEP

Technical Support Center Equipment

Equipment	Quantity	Replaced/ Comments (X if present)
Documents		
Plant Technical Specifications	1	
Operating Procedures Manual	1 set	
Emergency Operating Procedures Manual	1	
Final Safety Analysis Report	1 set	
Emergency Plan	1	
Emergency Plan Implementing Procedures	1	
Dose Calculation Manual	1	
Plant as built drawings	1 set	
Emergency Phone Directory	10	
Status Boards		
TSC Open Items	1	
Big Picture (Rx parameters, Rad-Data, ECCS in/out of service)	1	
Elevation Floor Plans	1 set	
Action Steps	1 set	
Team Tracking	1 set	
Release Rate Trending Graph	1	
TSC Personnel on Duty	1	
Emergency Planning Map with Offsite Monitoring Locations	1	
On-site Monitoring Locations Map	1	
Document Control Area:		
35 mm Microfilm Reader/Printer	1	
16 mm Page Search Microfilm Reader/Printer	1	
Microfiche Dry Reader/Printer	1	
Microfilm Storage Cabinet	1	
Microfiche Storage Cabinet	1	
Aperature Card Storage Cabinet	2	
Desk Top Copy Machine	1	
FACSIMILE	1	

Continued...

Equipment	Quantity	Replaced/ Comments (X if present)
Furniture:		
Misc. Storage Cabinets	3	
Desks	7	
Desk Chairs	30	
Book Cases	5	
Tables	6	
Action Step Folders:		
Emergency Director	1	
Communications Coordinator-TSC	1	
Radiological Support Coordinator	1	
Log Books:		
Emergency Director	1	
Communications Coordinator-TSC	1	
Radiological Support Coordinator	1	
Radioman	1	

Reviewed by _____ Reviewed by _____
Tech. Supv. SNEP

Inventory Date _____
Initials _____

Emergency On-Site Search and Rescue First Aid Equipment

Equipment	Quantity	Replaced/ Comments (X if present)	Locations
First Aid Team Initial Response Kit with inventory sheet	4	_____	North Gate House
		_____	Control Room
		_____	HP Office S&A
		_____	First-Aid Rm. S&A
Trauma Kit with inventory sheet	1	_____	First-Aid Rm. S&A
Adjustable litters	2	_____	First-Aid Rm. S&A
Folding litter	1	_____	First-Aid Rm. S&A
Basket Stretcher	1	_____	First-Aid Rm. S&A
Scoop Stretcher	1	_____	First-Aid Rm. S&A
Assorted Air Splints	12	_____	First-Aid Rm. S&A
Assorted Padded Board Splints	36	_____	First-Aid Rm. S&A
Portable Oxygen-Demand Valve (size D tank) with assorted airways, cannulas, and masks	1	_____	First-Aid Rm. S&A

Reviewed by _____
Safety and Health Consultant

Reviewed by _____
SNEP

Inventory Date _____
Initials _____

Damage Control Equipment Storage Box

Equipment	Quantity	Replaced/ Comments (X if present)
Screwdrivers, Large St.	2	_____
Screwdrivers, Medium St.	2	_____
Screwdrivers, Phillips, Large	2	_____
Screwdrivers, Phillips, Medium	2	_____
Hammer, Ball Peen, 16 Oz.	2	_____
Bars, Pry, Rolling Lead	2	_____
Bars, Pry, Large	2	_____
Wrench, Adjustable, 12"	2	_____
Wrench, Adjustable, 8"	2	_____
Pliers, Water Pump	2	_____
Pliers, Lineman	2	_____
Wrenches, Hex, 24"	2	_____
Wrench, Chain	1	_____
Wrench, Pipe, 18"	1	_____
Wrench, Pipe, 14"	1	_____
Nylon Rope, 100' coils, 3/4"	2	_____
Nylon Rope, 50' coil, 3/8"	1	_____

Continued...

Equipment	Quantity	Replaced/ Comments (X if present)
Nylon Rope, 50' coils, 3/4"	2	_____
Nylon Rope, 25' coil, 3/8"	1	_____
Twine, Bale	1	_____
String, Ball	2	_____
Plastic Sheet, 20' x 20', Fire Retardant	3	_____
Flashlight, 5 cell	1	_____
Clamps, C, Small	2	_____
Clamps, C, Medium	2	_____
Clamps, C, Large	2	_____
Bucket, 14 Qt., Plastic	1	_____
Rubber, Roll, 1/16" Thick, 10' x 3'	1	_____
Hammer, Sledge, 10 Lb	1	_____
Hammer, Sledge, 8 Lb	1	_____
Plugs, Wooden Box, 1", 1-1/4", 1-1/2", 2", 2-1/2", 3"	4 ea.	_____
Enerpac, Rescue Unit.	1	_____
Black Wire, 1/4 Lb Rolls, 16 Gauge	2	_____
Wedges, Wooden	24	_____

Continued...

Equipment	Quantity	Replaced/ Comments (X if present)
Box, Tool, 23"	1	_____
Wrench, Allen Pac 3/16", 7/32", 1/4", 5/16", 3/8"	2 Packs	_____
Wrench, Allen Pac .050", 1/16", 5/64", 3/32", 7/64", 1/8", 9/64", 5/32", 3/16", 7/32"	2 Packs	_____
Electricians Pouch with miscellaneous hand tools	2	_____
Cable Cutters	1	_____
Multimeter	1	_____
Wood Plugs 1" + 6"	2	_____
Hex Wrench #110	2	_____
Hex Wrench #17	2	_____

Reviewed by _____ Supv. of Maint.

Reviewed by _____ SNEP