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Ladies/Gentlemen:

DOCKETS 50-266 & 50-301
EMERGENCY PLAN IMPLEMENTING PROCEDURE REVISIONS
POINT BEACH NUCLEAR PLANT, UNITS 1 & 2

Enclosed are copies of revised procedures to the Point Beach Nuclear Plant Emergency Plan Implementing Procedures. The revised procedures dated June 27, 2000, should be filed in your copy of the manual in accordance with the attached instructions.

Sincerely,

A. J. Cayia
Manager,
Site Services & Assessment

tat

Enclosures

cc: NRC Resident Inspector (w/o/e)

A-45

June 27, 2000

The following changes have been made to the Emergency Plan Implementing Procedures (EPIP) Manual. Please remove the previous revision(s) and replace them **IMMEDIATELY** with the current revision(s) that are attached.

1. EPIP Index, Revision 67.
2. EPIP 1.3, Dose Assessment and Protective Action Recommendations, Revision 27.
3. EPIP 11.2, Medical Emergency, Revision 13.

NUCLEAR POWER BUSINESS UNIT
EMERGENCY PLAN IMPLEMENTING PROCEDURES

EPIP INDEX
Revision 67
June 27, 2000

INDEX

PROCEDURE NUMBER	PROCEDURE TITLE	REVISION NUMBER		EFFECTIVE DATE	PERIODIC REVIEW DATE
EPIP 1.1	Course of Actions	35	C	01/26/00	11/30/99
EPIP 1.2	Emergency Classification	33	R	11/30/99	11/30/99
EPIP 1.3	Dose Assessment and Protective Action Recommendations	27	R	06/27/00	11/30/99
EPIP 2.1	Notifications - ERO, State & Counties, and NRC.....	19	R	02/18/00	11/30/99
EPIP 4.1	Technical Support Center (TSC) Activation and Evacuation	29	R	11/30/99	11/30/99
EPIP 4.2	Operations Support Center (OSC) Activation and Evacuation	14	R	11/30/99	11/30/99
EPIP 4.3	Emergency Operations Facility (EOF) Activation and Evacuation	22	R	11/30/99	11/30/99
EPIP 4.7	Offsite Radiation Protection Facility (OSRPF) Activation and Evacuation	0	R	11/30/99	11/30/99
EPIP 5.1	Personnel Emergency Dose Authorization.....	12	R	11/30/99	11/30/99
EPIP 5.2	Radioiodine Blocking and Thyroid Dose Accounting	11	R	11/30/99	11/30/99
EPIP 6.1	Assembly and Accountability, Release and Evacuation of Personnel.....	17	R	02/18/00	11/30/99
EPIP 7.3.1	Offsite Radiation Sampling and Survey	20	R	11/30/99	11/30/99
EPIP 7.3.2	Post-Accident Isokinetic Stack Sampling System.....	6	R	03/31/00	10/28/98
EPIP 7.3.7	Estimating Radioiodine Air Concentrations.....	4	R	03/31/00	10/28/98
EPIP 8.4.1	Post-Accident Sampling and Analysis of Potentially High Activity Reactor Coolant	14	C	05/19/00	10/28/98
EPIP 8.4.2	Post-Accident Sampling of Containment Atmosphere	9	C	05/19/00	10/28/98
EPIP 8.4.3	Emergency Containment Sump "A" Sampling	6		05/19/00	10/28/98
EPIP 10.1	Emergency Reentry	19	R	11/30/99	11/30/99
EPIP 10.2	Core Damage Estimation.....	18	R	11/30/99	11/30/99
EPIP 10.3	Post Accident Containment Hydrogen Reduction.....	5	R	05/19/00	10/28/98
EPIP 11.2	Medical Emergency	13	R	06/27/00	11/30/99

(T - Temporary Change)

NAMES AND
TELEPHONE NUMBERS
DELETED

Page 1 of 2

C = Continuous Use
R = Reference Use
I = Information Use

NUCLEAR POWER BUSINESS UNIT
EMERGENCY PLAN IMPLEMENTING PROCEDURES

EPIP INDEX
Revision 67
June 27, 2000

INDEX

<u>PROCEDURE NUMBER</u>	<u>PROCEDURE TITLE</u>	<u>REVISION NUMBER</u>		<u>EFFECTIVE DATE</u>	<u>PERIODIC REVIEW DATE</u>
EPIP 12.1	Emergency Event De-Escalation, Termination, or Recovery Operations	7	R	11/30/99	11/30/99
EPIP 12.2	Recovery Implementation.....	12	R	11/30/99	11/30/99

(T - Temporary Change)

C = Continuous Use
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EPIP 1.3

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS



*Wisconsin
Electric
Power Company*

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DELETED

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

TABLE OF CONTENTS

Page 1 of 2

SECTION	TITLE	PAGE
1.0	PURPOSE.....	4
2.0	PREREQUISITES	4
3.0	PRECAUTIONS AND LIMITATIONS.....	5
4.0	INITIAL CONDITIONS	5
5.0	PROCEDURE.....	6
5.1	Wisconsin Electric Dose Assessment Program (WEDAP)	6
5.2	Radiation Monitoring System-System Server (RMS-SS).....	10
5.3	Offsite Field Measurements	17
5.4	Manual Calculations	18
6.0	REFERENCES	49
7.0	BASES	49
TABLES		
TABLE 1	RELEASE MONITORS ALARMING.....	11
TABLE 2	RELEASE RATE CALCULATIONS	13
TABLE 3	RELEASE RATE CONVERSION FACTORS - SURVEY METER METHOD.....	21
TABLE 4	CLASSIFICATION OF ATMOSPHERIC STABILITY BY SIGMA THETA AND $\Delta T/\Delta H$	27
TABLE 5	BACKUP DETERMINATION OF ATMOSPHERIC STABILITY CLASS.....	28
TABLE 6	TABLE OF CENTERLINE X_u/Q VALUES VERSUS DISTANCE FROM THE SITE	29
TABLE 7	SOURCE TERM ACTIVITY FRACTIONS	41

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

TABLE OF CONTENTS

Page 2 of 2

SECTION	TITLE	PAGE
ATTACHMENTS		
ATTACHMENT A	AFFECTED SECTORS BASED ON WIND DIRECTION	50
ATTACHMENT B	GENERAL EMERGENCY OFFSITE PROTECTIVE ACTIONS	51
ATTACHMENT C	REINSTALLATION OF WEDAP SOFTWARE	52
WORKSHEETS		
WORKSHEET 1	RELEASE RATE CALCULATIONS	22
WORKSHEET 2	X/Q DETERMINATION.....	26
WORKSHEET 3	ESTIMATED WHOLE BODY DOSE.....	31
WORKSHEET 4	ESTIMATED THYROID DOSE	33
WORKSHEET 5	ESTIMATED GROUND DEPOSITION	36
WORKSHEET 6	ESTIMATED POPULATION DOSE	38

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

1.0 PURPOSE

This procedure provides several methods to project offsite dose due to a release of radioactive material. These projections will be used to provide Protective Action Recommendations (PARs) to the State and Counties.

2.0 PREREQUISITES

2.1 Responsibilities

- 2.1.1 The Duty Shift Superintendent (DSS) is responsible for the radiological dose assessment and protective action recommendations using WEDAP, prior to TSC/EOF activation and formal transfer of responsibilities to the Emergency Director. If available, the DSS may assign this task to the Operating Supervisor(s) (from unaffected unit) or the Shift Technical Advisor (STA). RMS-SS is used in the absence of WEDAP and Field Monitoring Team data is used in the absence of RMS-SS.
- 2.1.2 The Emergency Director may delegate the performance of radiological release evaluation portion of this procedure to the Dose/PAR Coordinator. The Dose/PAR Coordinator will advise the Emergency Director of the need to escalate the emergency classification or change protective action recommendations.
- 2.1.3 The Dose/PAR Coordinator is responsible for the continuing dose assessment and Protective Action Recommendations to the Emergency Director using WEDAP, Field Monitoring Team data, RMS-SS, and/or manual calculations.
- 2.1.4 **IF** the Dose/PAR Coordinator is unable to perform radiological release evaluations, **THEN** the Rad/Chem Coordinator in the TSC will assume this responsibility.

2.2 Equipment

- 2.2.1 Wisconsin Electric Dose Assessment Program (WEDAP)
- 2.2.2 Radiation Monitoring System-System Server (RMS-SS)
- 2.2.3 Plant Process Computer System (PPCS)

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Complete this procedure regardless of changing plant conditions.
- 3.2 Recommendations of protective actions to be taken offsite shall be approved only by the Emergency Director.
- 3.3 Protective action recommendations are typically made a full 360° within 2 miles of the plant and a 67.5° - 90° downwind sector centered on the average wind direction (keyhole) for 5 miles.
- 3.4 Consider recommending protective actions for ALL sectors (360°) to 5 miles if wind speeds are less than 3 mph or the difference between actual (i.e., none greater than 360°) wind direction values for inland and near shore meteorological towers is greater than 90° (i.e., indications of a lake breeze).
- 3.5 Use 15 minute averaged values for wind speed and wind direction. This information can be obtained from the Plant Process Computer System (PPCS) and digital locations.
- 3.6 Use a realistic estimate of release duration in these calculations whenever possible, with input from the Reactor/Core Physics Engineer. **IF** the duration of the radiological release can **NOT** be determined from the current plant conditions, **THEN**, assume a duration of four hours.
- 3.7 **IF** the meteorological data can **NOT** be obtained from the PPCS or the control room instruments, **THEN** obtain the data from any of the following sources:
(Reference ETD 02, Offsite Agency Call List):
 - 3.7.1 National Weather Service in Green Bay
 - 3.7.2 Kewaunee Nuclear Power Plant
 - 3.7.3 Two Rivers Coast Guard Station

4.0 INITIAL CONDITIONS

- 4.1 EPIP 1.1, Course of Actions, in progress.
- 4.2 RMS or plant conditions suggest that a release is in progress or anticipated.

5.0 PROCEDURE

5.1 Wisconsin Electric Dose Assessment Program (WEDAP)

NOTE: The "Source Term" and "Release Path" categories will have drop-down menus to determine the severity of the event and should be opened to select the appropriate category for the event. When opened, each drop-down menu has been organized to list the options from the least severe to the most severe.

NOTE: IF WEDAP is NOT available in the Control Room, THEN go to Step 5.2 for assessment by using RMS-SS, OR, IF WEDAP is NOT available in the EOF (TSC if backup), THEN go to Attachment C, "Reinstallation of WEDAP Software."

- 5.1.1 Power up the designated personal computer (PC) using the master power switch to "boot up" into Windows NT, selecting "stand-alone" if presented with a selection of configurations during bootup.
- 5.1.2 Log on to the PC using the PC number (label affixed to PC) as both the identification number and password, entering it in lower case.
- 5.1.3 Launch WEDAP by selecting "Business Applications – WEDAP" or the "WEDAP icon."
- 5.1.4 Select "Start" when prompted at WEDAP introduction screen.
- 5.1.5 Enter a "Title" for this dose assessment case to provide retrievability if the case is saved.
- 5.1.6 Click on "Data" on the toolbar and select the option "Case Basis."
- 5.1.7 Click on the appropriate "Accident Type" for the event.
- 5.1.8 Update all the data fields in the "Source Term" section.
- 5.1.9 Update all the data fields in the "Release Path" section.
- 5.1.10 Click "OK" to return to the summary page.
- 5.1.11 Verify details in the "Accident Data" section are based upon the data selected in Steps 5.1.5 - 5.1.9, returning to "Data" and "Case Basis" to make corrections if necessary.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- 5.1.12 Update "Reactor Shutdown Time" data field with the correct data if applicable.
- 5.1.13 Update "Release Start" by entering the time the release to environment began.
- 5.1.14 Update "Release End" by entering the correct data for an estimated time the release to environment will terminate.
IF release duration is unknown,
THEN use four hours as a default value.
- 5.1.15 Update the "Meteorological Data" section categories by clicking on each data field and selecting the correct data:
 - a. Met Date
 - b. Stability Class (automatically updates "Building Wake" check box)
 - c. Sigma Theta (Only key-in value from PPCS if stability class unavailable and >3 mph wind speeds)
 - d. Lapse Rate (Only key-in value from PPCS if stability class is unavailable and <3 mph wind speeds)
 - e. Precipitation
 - f. Lake Breeze
 - g. Wind Speed
 - h. Wind Direction
- 5.1.16 Verify the data on the WEDAP main screen and make corrections if appropriate.
- 5.1.17 Click on the "Calculate" icon to perform the final dose assessment calculations, which automatically updates the dose assessment data fields.
- 5.1.18 Review the dose assessment result tabs (a single click for simple data OR double-click for expanded data).
 - a. Dose
 - b. Dose Rate
 - c. Event Class
 - d. PAR's

- 5.1.19 Compare the results of 5.1.18 against the current classification and PARs.
- a. IF in the Control Room AND the result of this assessment is an escalation of classification and/or PARs,
THEN go to EPIP 1.1, Step 5.5,
OR exit this procedure if NOT an escalation.
 - b. IF in the EOF (TSC if backup) AND the result of this assessment is an escalation of classification and/or PARs,
THEN immediately inform the Emergency Director and assist with EPIP 2.1 for initiating notifications,
OR proceed to the next step for a continuous dose assessment if NOT an escalation:

NOTE: The "View" icon on the toolbar is to access additional tables and maps available for reference use.

NOTE: To save the data from a series of case assessments, click on "File," "Save Scenario File," and then relick on "File" and "Restart WEDAP" to start a new scenario with new cases.

- 5.1.20 Click on the "Print Case" icon to create a hard copy of the current case.
IF the printer connection is not established,
THEN go to EPIP 1.3, Attachment C, Step 2.0.

- 5.1.21 Click on the "Add Case" or "Insert Case" icon as appropriate to run the next dose assessment.

- a. Determine if this case is to be based upon a cumulative dose and change the field as appropriate.
- b. Repeat Steps 5.1.5 - 5.1.19
- c. IF time permits to run a more detailed dose assessment case,
THEN implement the following steps:
 - Click on "Data," select the option "Equipment Status," enter the Unit affected, and update all the data fields in the "Equipment Status" section.
 - Click on "Data," select the option "Measured Data," and select one of the following options for entering values from actual data sources:
 - (a) "RMS Data - Manual Input" and update the field with the RMS monitors and readings in high alarm status.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- (b) "Offsite Measurements - Isotopic Data" and update the fields with the correct data, including selecting the nuclides involved.
- (c) "Offsite Measurements - Survey Reading" and update the fields with the correct data.
- (d) "Isotopic Release Rate" and select the nuclides involved, updating with the correct data.

NOTE: Cases can be generated on actual event data or "what-if" scenarios.

- d. **IF** the case was built on a "what-if" scenario,
THEN repeat Step 5.1.17, Step 5.1.18, and Step 5.1.20,
THEN click on the "Delete Case" icon, **AND** repeat Step 5.1.21.
- e. **IF** the case was built on the actual events in progress,
THEN repeat Steps 5.1.17 - 5.1.19

Performed By:

Performer (Print and Sign)

Date / Time

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

5.2 Radiation Monitoring System-System Server (RMS-SS)

5.2.1 **IF** WEDAP

AND RMS-SS are unavailable,

THEN declare an ALERT to activate the Emergency Response Facilities (ERFs) so dose assessment can be performed using field data,

AND go to EPIP 1.1, Step 5.5,

AND Step 5.3 of this procedure, performing both simultaneously.

5.2.2 Verify RMS-SS is available:

- a. The letters "M" (master) and "S" (slave) are intermittently displayed in the upper right hand corner of the SS monitor. The time is also correct and moving forward. This indicates BOTH SSs are operating.

OR

- b. An "X" appears in the upper right hand corner of the SS monitor and the time is correct and moving forward. This indicates that a single SS is operating.

5.2.3 Estimate Release Rate Using Data From RMS-SS

NOTE: Using the "ESC" key returns the SS to the main menu screen

- a. Obtain a list of monitors in high alarm by performing the following:
 - From the Main Menu Screen (MMS), highlight (using arrow keys) "Display Status", press "Enter"
 - Highlight "Status", press "Enter"
 - Highlight item "20" (high alarm), press "enter" and all channels in high alarm will be listed
- b. Call up data (microcuries/cc) on the RMS-SS for each monitor in high alarm by performing the following and log on Table 1:
 - From the MMS, highlight "Data", press "Enter"
 - Highlight "Ten Minute History" (or other interval as needed), press "Enter"
 - Enter the DAM or SPING address (DAM1 to DAM8, SPING21 to SPING24), press "Enter"

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- Enter channel number (1 to 9), press enter
 - Press "Enter" to toggle between available screens
- c. Data may be printed by highlighting "Print" on the relevant screen and pressing "Enter".

TABLE 1
RELEASE MONITORS ALARMING

DAM	CHANNEL	RMS #	MONITOR	READING (μ Ci/cc)
1	3	1RE-212	U1 Cont. Purge	_____
2	3	2RE-212	U2 Cont. Purge	_____
3	9	1RE-231	SG 1A	_____
4	9	2RE-231	SG 2A	_____
5	2	1RE-232	SG 1B	_____
5	7	RE-221	Drum Area Vent	_____
5	8	RE-226	Comb A. E. High Range Steam Line	_____
6	6	RE-224	Gas Stripper Building	_____
6	2	2RE-232	SG2B	_____
7	1	RE-225	Comb A. E. Low Range	_____
7	4	RE-214	Aux Building Vent	_____
21	5	1RE-305	Low Range Gas, U1 Purge	_____
21	7	1RE-307	Medium Range Gas, U1 Purge	_____
21	9	1RE-309	High Range Gas, U1 Purge	_____
22	5	2RE-305	Low Range Gas, U2 Purge	_____
22	7	2RE-307	Medium Range Gas, U2 Purge	_____
22	9	2RE-309	High Range Gas, U2 Purge	_____
23	5	RE-315	Low Range Gas, Aux Bldg Vent	_____
23	7	RE-317	Medium Range Gas, Aux Bldg Vent	_____
23	9	RE-319	High Range Gas, Aux Bldg Vent	_____
24	5	RE-325	Low Range Gas, Drumming Area Vent	_____
24	7	RE-327	Medium Range Gas, Drumming Area Vent	_____

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- 5.2.4 **IF** the release path monitor(s) is/(are) failed high and the associated SPING(s) is/(are) out of service,
 THEN declare an ALERT to activate the Emergency Response Facilities (ERFs) so dose assessment can be performed using field data and/or WEDAP,
 AND go to EPIP 1.1, Step 5.5, to end,
 AND Step 5.3 of this procedure, performing both simultaneously.
- 5.2.5 Record the highest in-range (**NOT** failed) alarming RMS channel readings ($\mu\text{Ci/cc}$) for each release path on Table 2 and calculate the release rate.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

TABLE 2
RELEASE RATE CALCULATIONS

NOTE: Conversion factors assume nominal flow rates.

RMS #	LOCATION	READING ($\mu\text{Ci/cc}$)	CONVERSION (cc-Ci/sec- μCi)	RELEASE RATE (Ci/sec)
RE-214 RE-315 RE-317 RE-319	Auxiliary Building Vent ↓	_____	x 33	= _____
RE-221 RE-325 RE-327	Drumming Area Vent ↓	_____	x 20	= _____
1RE-212 1RE-305 1RE-307 1RE-309	U1 Containment Purge (0 or 1 fan) ↓ (2 fans)	_____ _____ _____	x 6 x 12	= _____ = _____
2RE-212 2RE-305 2RE-307 2RE-309	U2 Containment Purge (0 or 1 fans) ↓ (2 fans)	_____ _____ _____	x 6 x 12	= _____ = _____
RE-224	Gas Stripper Bldg	_____	x 6	= _____
RE-225 RE-226	Combined Air Ejectors ↓	_____	x 0.012	= _____
RE-231 RE-232	A Steam Line Header B Steam Line Header ↓ Atmospheric 1 Safety 2 Safeties 3 Safeties 4 Safeties	_____ _____ _____ _____ _____ _____ _____	x 1.0 x 2.5 x 5.0 x 7.6 x 10.1	= _____ = _____ = _____ = _____ = _____
Release Rate Total (Ci/sec)				= _____

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

NOTE: IF desired PPCS points have poor or bad quality, THEN obtain $\sigma\theta$ and lapse rate readings from the Control Room indications, AND THEN reference Table 5 to determine stability class.

5.2.6 Calculate the Dispersion Factor (X/Q) at the Site.

- a. Obtain the wind speed and stability class from the PPCS "Release/MET Summary" screen. Record wind speed in Step 5.2.6.c equation.
- b. Select the appropriate Xu/Q factor value from the table below based upon the stability class. Record the X/Q factor value in Step 5.2.6.c equation.

Stability Class	Xu/Q
A	9.92E-07
B	1.18E-05
C	4.28E-05
D	1.34E-04
E	2.55E-04
F	5.38E-04
G	1.04E-03

c. Calculate the dispersion factor:

$$\frac{\text{Xu/Q (mph / m}^3\text{ / s)}}{\text{(step b above)}} \div \frac{\text{wind speed (mph)}}{\text{wind speed (mph)}} = \text{X / Q (s / m}^3\text{)}$$

5.2.7 Determine the Estimated Duration (ERD) of release. Use four hours as a default if the ERD is unknown.

5.2.8 Estimate the Projected Whole Body Dose (TEDE) at the Site Boundary.

$$3280 \frac{\text{rem} \cdot \text{m}^3}{\text{Ci/hr}} \times \frac{\text{Xu/Q (Table 2 Total)}}{\text{(Table 2 Total)}} \times \frac{\text{X/Q (Step 5.2.6.c)}}{\text{(Step 5.2.6.c)}} \times \frac{\text{ERD}}{\text{(ERD)}} = \frac{\text{[PROJ. W. B. DOSE (TEDE)]}}{\text{[PROJ. W. B. DOSE (TEDE)]}} \text{Rem}$$

5.2.9 Calculate Projected Thyroid Dose (CDE) at the Site Boundary.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

NOTE: Choose LOCA accident type unknown			
ACCIDENT TYPE	PROJECTED WHOLE BODY DOSE (TEDE) (Rem) (From Step 5.2.8)	CONVERSION FACTOR	PROJECTED THYROID DOSE (CDE) (Rem)
LOCA	_____	x 15 =	_____
Gap Activity	_____	x 3 =	_____
Fuel Handling	_____	x 20 =	_____
SG Tube Rupture	_____	x 12 =	_____

5.2.10 **IF** the event meets the following criteria for a GENERAL EMERGENCY, **THEN** go to Step 5.2.14 and determine PARS.

a. Projected Whole Body Dose (TEDE) at Site Boundary is ≥ 1 Rem.

OR

b. Projected Thyroid Dose (CDE) at Site Boundary is ≥ 5 Rem.

5.2.11 **IF** the event meets the following criteria for a SITE EMERGENCY, **THEN** go to Step 5.2.15.

a. Projected Whole Body Dose (TEDE) at Site is ≥ 0.1 Rem.

OR

b. Projected Thyroid Dose (CDE) at Site Boundary is ≥ 0.5 Rem.

5.2.12 **IF** the event meets the following criteria for an ALERT, **THEN** go to Step 5.2.15.

One of more effluent radiation alarming monitor readings is >10 times high alarm setpoint for >15 minutes [Radiation Monitoring System Alarm Setpoint & Response Book (RMSASRB)].

5.2.13 **IF** the event meets the following criteria for an UNUSUAL EVENT, **THEN** go to Step 5.2.15.

One or more effluent radiation alarming monitor readings is $>$ high alarm setpoint for >60 minutes [(Radiation Monitoring System Alarm Setpoint & Response Book (RMSASRB))].

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

5.2.14 Determine Protective Action Recommendations

NOTE: Lake breeze conditions exist if the difference between actual wind direction values for inland and near shore meteorological towers is greater than 90°.

- a. To determine protective action recommendations compare values from Step 5.2.9 and the values in the "Integrated Projected Dose" column below.

INTEGRATED PROJECTED DOSE	PROTECTIVE ACTION	MILES	SECTORS
<1 rem TEDE AND <5 rem CDE	None Required	N/A	N/A
≥1 rem TEDE OR ≥5 rem CDE	Evacuate Evacuate	0-2 miles 2-5 miles	All (360°) Downwind Sectors
<3 mph Wind Speed OR Lake Breeze AND ≥1 rem TEDE OR ≥5 rem CDE	Evacuate	0-5 Miles	All (360°)

- b. Select downwind sectors using Attachment A.

- 5.2.15 Compare the results against the current classification and PARS.
IF the results of this assessment is an escalation of classification and/or PARS,
THEN go to EPIP 1.1, Step 5.5,
OR exit this procedure if **NOT** an escalation.

Performed By:	
_____	_____ / _____
Performer (Print and Sign)	Date / Time

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

5.3 Offsite Field Measurements

5.3.1 Check if Plume Impacts Terrestrial Areas

- a. Wind Direction $> 305^\circ$

OR

- b. Wind Direction $< 210^\circ$

5.3.2 Use Field Monitoring Team(s) to measure gamma dose rate at 1-mile from the site and log.

Maximum measured gamma dose rate: _____ R/hr

5.3.3 **IF** measurement from Step 5.3.2 is ≥ 1 R/hr,
THEN event is a GENERAL EMERGENCY.

5.3.4 **IF** a General Emergency,
THEN determine minimum Protective Action Recommendations,
AND go to Step 5.3.6.

- a. Evacuation of 0-2 miles for all sectors, and 2-5 miles in the downwind sectors.

OR

- b. Evacuation of all sectors (360°) to 5 miles, **IF** wind speed less than three (3) mph or lake breeze conditions exist.

5.3.5 **IF** measurements from Step 5.3.2 is ≥ 0.1 R/hr,
THEN event is a SITE EMERGENCY,
AND go to Step 5.3.6.

5.3.6 Compare the results of your assessment against the current classification and PARS.
IF the results of this assessment is an escalation of classification and/or PARS,
THEN go to EPIP 1.1, Step 5.5,
OR exit this procedure if **NOT** an escalation.

Performed By:

Performer (Print and Sign)

Date / Time

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

5.4 Manual Calculations

5.4.1 Manual Calculation of Release Rates (Source Terms)

a. Airborne effluents may be discharged from PBNP through the following vent stacks and their associated monitors:

- Auxiliary building vent (ABVNT)
RE-214, RE-315, RE-317, and RE-319
- Drumming area vent (DAVNT)
RE-221, RE-325, and RE-327
- Unit 1 containment purge vent (Cont. 1)
1RE-212, 1RE-305, 1RE-307, and 1RE-309
- Unit 2 containment purge vent (Cont. 2)
2RE-212, 2RE-305, 2RE-307, and 2RE-309
- Gas stripper building vent (GSBVNT)
RE-224

NOTE: This CAE pathway vents to the Auxiliary Building Vent Stack.

- Combined air ejector decay duct (CAE)
1(2)RE-215, RE-225, RE-226
- Main steam safety valves and atmospheric dump valves
1(2)RE-231 "A" Steam Generator
1(2)RE-232 "B" Steam Generator

b. The release rates may be estimated using any of the following monitoring systems:

- PPCS
- Radiation monitoring system (which is designed to monitor low and high level releases)

NOTE: The contact reading method is used when the other monitoring systems are inoperable.

- Contact readings using a hand-held survey meter. It is assumed that the direct contact readings are determined using an RO-2A, Teletector, or equivalent survey meter.

NOTE: The actual number of main steam safety valves and atmospheric dump valves open should be obtained from the Duty Shift Superintendent to estimate the release rate.

- c. Record above normal monitor reading(s) in the "Reading" column in Section A of Worksheet 1. Enter a comment for any monitor reading that is off-scale or inoperable.
- d. Multiply the reading by the conversion factor and entering the result in the "Release Rate" column on Section A of Worksheet 1.
- e. **IF** monitor readings are available for all release paths, **THEN** go to Step 5.4.1.j.

NOTE: The direct contact survey is accomplished under the direction of the Rad/Chem Coordinator. It must be approved by the TSC Manager and the Duty Shift Superintendent.

- f. Do **NOT** perform direct contact readings using a hand-held survey meter until the following actions have been done:
 - Evaluate the radiological conditions prior to entering the Auxiliary Building or the Containment Building facade.
 - Choose the proper survey meter and the most direct and desirable route to the stack, pipe, or vent.
- g. Perform direct contact readings using a hand-held survey meter when RMS readings are **NOT** available. Enter direct contact readings in the "Meter Reading" column of Section B of Worksheet 1.

To take the survey of the main steam safety valves and the atmospheric dump valves place the meter probe in contact with the centerline of the main steam header, three feet from the main steam line.

- Shield the survey probe with a minimum of ¼ inch of lead on the main steam line/containment building side of the probe.
- Obtain the probe shield from the Radiation Protection supply locker in the Operations Support Center (OSC).

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- h. For each direct contact reading in any area, enter the conversion factor from Table 3 in the "Conversion Factor" column on Worksheet 1. Conversion factors are accident type dependent.
- i. Multiply the direct contact reading by the conversion factor to calculate the release rate. Enter the release rate in the "Release Rate" column of Section B of Worksheet 1.
- j. **IF** actual flow rates vary significantly from the assumed flow rates listed on Worksheet 1,
THEN adjust the flow rates using Section C of Worksheet 1.
- k. Enter all calculated release rates in the appropriate spaces in Section D of Worksheet 1. Total all release rates to calculate the gross release rate.
- l. Sign and date Worksheet 1 and fax upon completion to the Dose/PAR Coordinator.

TABLE 3
RELEASE RATE CONVERSION FACTORS - SURVEY METER METHOD

Units of expression are Ci-h/s-rem.

ACCIDENT TYPE						
<u>Vent Pathway</u>	<u>LOCA</u> ⁽¹⁾	<u>Gap Accident</u> ⁽⁴⁾		<u>FHA</u> ⁽¹⁾	<u>Steam Generator Tube Rupture</u> ⁽²⁾	
		<u>0-12 hours</u>	<u>> 12 hours</u>		<u>No condenser</u>	<u>Condenser</u>
Aux. Building	9.40	12.6	79.0	373	-	-
Drumming Area	6.00	8.00	41.1	104	-	-
Cont. Purge	2.60	3.50	20.0	74.0	-	-
Gas Stripper	2.48	3.31	20.0	83.0	-	-
Air Ejector	-	-	-	-	1.40	1.40E+04
Steam Line						
Atmospheric	-	-	-	-	164	-
Safety, 1	-	-	-	-	410	-
Steam Driven AFWP	-	-	-	-	0.235	

Note: (1) The accident type acronyms are: LOCA - Loss of Coolant Accident and FHA - Fuel Handling Accident

(2) No condenser means that the vent pathway is **NOT** through the condenser. Condenser means the vent pathway is through the condenser.

(3) The release rate conversion factors were calculated using the following flow rates:

<u>Vent Pathway</u>	<u>Flow Rate (ft³/min)</u>
Auxiliary Building	70000
Drumming Area	43100
Containment Purge	12500
Gas Stripper	13000
Air Ejector	25
Atmospheric Vent	3200
Safety, 1	8000
Steam Driven AFWP	4.2

(4) The time intervals referred to in the Gap Accident are for the time periods 0 to 12 hours and greater than 12 hours after reactor shutdown

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

WORKSHEET 1
RELEASE RATE CALCULATIONS
Page 1 of 3

A. OPERATIONAL LOW-RANGE RELEASE MONITOR READOUTS
(Assumed flow rates are in parentheses)

<u>Monitor</u>	<u>Reading</u> <u>(μCi/cc)</u>	<u>Conversion</u> <u>Factor</u> <u>(cc-Ci/s-μCi)</u>	<u>Release Rate</u> <u>(Ci/s)</u>
Auxiliary Building Vent (70,000 cfm) (RE-214, RE-315, RE-317, or RE-319)	_____	33	_____
Drumming Area Vent (43,100 cfm) (RE-221, RE-325, or RE-327)	_____	20	_____
Unit 1 Containment Purge (RE-212, RE-305, RE-307, or RE-309)			
(0 or 1 fan - 12,500 cfm)	_____	6	_____
(2 fans - 25,000 cfm)	_____	12	_____
Unit 2 Containment Purge (RE-212, RE-305, RE-307, or RE-309)			
(0 or 1 fan - 12,500 cfm)	_____	6	_____
(2 fans - 25,000 cfm)	_____	12	_____
Gas Stripper Building Vent (13,000 cfm) (RE-224)	_____	6	_____
Combined Air Ejector (25 cfm) (RE-215, RE-225, and RE-226)	_____	0.01	_____
Steam Driven Aux FW Pump [1(2)P-29] (4.2 cfm ea) (RE-219, RE-231, RE-232, or measured conc.)			
1 pump	_____	0.002	_____
2 pumps	_____	0.004	_____
Steam Line Vent (RE-231 and RE-232)			
Atmospheric (3200 cfm)	_____	1.5	_____
1 Safety (8000 cfm)	_____	4	_____
2 Safeties (16000 cfm)	_____	8	_____
3 Safeties (24000 cfm)	_____	12	_____
4 Safeties (32000 cfm)	_____	16	_____

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

WORKSHEET 1
RELEASE RATE CALCULATIONS
Page 2 of 3

B. PLANT EFFLUENT VENT STACK CONTACT READINGS
(Assumed flow rates are in parentheses)

Accident type : LOCA Gap Activity Fuel Handling S/G Tube Rupture Other

<u>Monitor</u>	<u>Meter Reading (R/hr)</u>	<u>Conversion Factor (Ci-h/s-rem) (Table 3)</u>	<u>Release Rate (Ci/s)</u>
Auxiliary Building Vent (70,000 cfm)	_____	_____	_____
Drumming Area Vent (43,100 cfm)	_____	_____	_____
Unit 1 Containment Purge			
(0 or 1 fan - 12,500 cfm)	_____	_____	_____
(2 fans - 25,000 cfm)	_____	_____	_____
Unit 2 Containment Purge			
(0 or 1 fan - 12,500 cfm)	_____	_____	_____
(2 fans - 25,000 cfm)	_____	_____	_____
Gas Stripper Building Vent (13,000 cfm)	_____	_____	_____
Combined Air Ejector (25 cfm)	_____	_____	_____
Steam Driven AFWP	_____	_____	_____
Steam Line Vent			
Atmospheric (3200 cfm)	_____	_____	_____
1 Safety (8000 cfm)	_____	_____	_____
2 Safeties (16000 cfm)	_____	_____	_____
3 Safeties (24000 cfm)	_____	_____	_____
4 Safeties (32000 cfm)	_____	_____	_____

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

WORKSHEET 1
RELEASE RATE CALCULATIONS
Page 3 of 3

C. ACTUAL VERSUS CONVERSION CURVE FLOW RATE RATIO

$$\frac{\text{Actual Flow Rate, cfm}}{\text{Assumed Flow Rate, cfm}} \times \text{Release Rate} = \text{Corrected Release Rate}$$

$$\frac{\left(\frac{\text{cfm}}{\text{cfm}} \right) \times \frac{\text{Ci}}{\text{s}} = \frac{\text{Ci}}{\text{s}}}$$

D. ESTIMATE OF GROSS RELEASE RATE

NOTE: The combined air ejector decay duct exhausts through the auxiliary building vent. Should a release occur through the combined air ejector duct, do **NOT** include its monitor reading in the gross release rate calculations because it will be reflected in the auxiliary building vent monitor reading.

	<u>Vent</u>	Release Rate (curies/s)
1.	Auxiliary Building	_____
2.	Drumming Area	_____
3.	Gas Stripper Building	_____
4.	Combined Air Ejector Duct	_____
5.	Main Steam Line Vent	_____
6.	Unit 1 Containment Purge	_____
7.	Unit 2 Containment Purge	_____
8.	Steam Driven AFW Pump	_____
9.	Total	_____

Completed By: _____ Date/Time _____ / _____

Route to Dose/PAR Coordinator upon completion.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

5.4.2 Determination of χ/Q , Atmospheric Dispersion Factor (Worksheet 2)

- a. Obtain the following information from the indicated source and enter this in the appropriate space on Worksheet 2.

<u>Data</u>	<u>Source</u>
• Wind speed (mph, 15-minute average)	PPCS or Control Room Instrumentation
• Wind direction (degrees, 15-minute average)	PPCS or Control Room Instrumentation
• Wind direction fluctuation (σ_θ , degrees)	PPCS or Control Room Instrumentation
• Temperature lapse rate ($\Delta T/\Delta H$, °F/35 m)	PPCS or Control Room Instrumentation
• Time of reactor shutdown	Operations Coordinator
• Time of RCS breach	Operations Coordinator
• Time of release from the plant	Operations Coordinator

NOTE: Realistic estimates of the duration of the release should be made whenever possible, with input from the Reactor/Core Physics Engineer. If the duration of the release is unknown, assume four hours.

• Estimated or actual duration of the release (hours)	Operations Coordinator or projected estimate
• Gross release rate (curies/second)	Worksheet 1

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

WORKSHEET 2
X/Q DETERMINATION

Complete this form every two hours during a release or whenever changing radiological or meteorological conditions.

1. Wind speed, 15 minute average, mph _____
2. Wind direction, 15 minute average, degrees _____
3. Wind direction fluctuation, σ_θ , degrees _____
4. Temperature lapse rate, $\Delta T/\Delta H$, $^\circ\text{F}/35 \text{ m}$ _____
5. Time of reactor shutdown _____
6. Time of RCS breach _____
7. Time of release from plant _____

NOTE: Realistic estimates should be used whenever possible. If the duration release is unknown, assume four hours.

8. Estimated or actual duration of release, hours _____
9. Gross release rate, curies per second _____
10. Pasquill category _____

11. Centerline Xu/Q from Table 6:

Site Boundary	Two Miles	Five Miles	Ten Miles	Other
_____	_____	_____	_____	_____

$$\frac{\chi}{Q} \left(\frac{\text{sec}}{\text{m}^3} \right) = 2.24 \left(\frac{\text{sec} - \text{mi}}{\text{hr} - \text{m}} \right) \times \frac{\chi u}{Q} \left(\frac{1}{\text{m}^2} \right) \times \frac{1}{\text{wind speed}} \left(\frac{\text{hr}}{\text{mi}} \right)$$

12. Centerline X/Q:

Site Boundary	Two Miles	Five Miles	Ten Miles	Other
_____	_____	_____	_____	_____

Completed By: _____ Date/Time _____ / _____

Route to Dose/PAR Coordinator upon completion.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

NOTE: Do NOT use σ_θ to determine the stability class when the wind speed is less than three miles per hour.

- b. Determine the stability class (Pasquill category) using the σ_θ or $\Delta T/\Delta H$ chart recorder values in the Control Room and Table 4. Enter the stability class on Worksheet 2.

TABLE 4
CLASSIFICATION OF ATMOSPHERIC STABILITY BY SIGMA THETA AND $\Delta T/\Delta H$

NOTE: When wind speed is less than three miles per hour, do NOT use σ_θ to determine the stability class.

Stability Classification	Pasquill Class	Wind Direction Fluctuation (σ_θ , degrees)*	Temperature Lapse Rate ($\Delta T/\Delta H$, °F/35 m)
Extremely unstable	A	$\sigma_\theta \geq 22.5^\circ$	$\Delta T/\Delta H \leq -1.2$
Moderately unstable	B	$22.5^\circ > \sigma_\theta \geq 17.5^\circ$	$-1.2 < \Delta T/\Delta H \leq -1.1$
Slightly unstable	C	$17.5^\circ > \sigma_\theta \geq 12.5^\circ$	$-1.1 < \Delta T/\Delta H \leq -0.9$
Neutral	D	$12.5^\circ > \sigma_\theta \geq 7.5^\circ$	$-0.9 < \Delta T/\Delta H \leq -0.3$
Slightly stable	E	$7.5^\circ > \sigma_\theta \geq 3.8^\circ$	$-0.3 < \Delta T/\Delta H \leq 0.9$
Moderately stable	F	$3.8^\circ > \sigma_\theta \geq 2.1^\circ$	$0.9 < \Delta T/\Delta H \leq 2.5$
Extremely stable	G	$2.1^\circ > \sigma_\theta$	$2.5 < \Delta T/\Delta H$

* Determined for a 15-minute to one-hour period for horizontal diffusion.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- c. **IF** necessary to determine the backup stability class determination, **THEN** visually check the cloud cover and the incoming solar radiation. Using this visual information and Table 5, enter the stability class on Worksheet 2.

TABLE 5
BACKUP DETERMINATION OF ATMOSPHERIC STABILITY CLASS

Surface Wind Speed (U mph @ 50 meter height)	DAY Incoming Solar Radiation			NIGHT Thinly Overcast	
	Strong	Moderate	Slight	> ½ low	< ½ cloud
U < 4	A	A-B	B	F	G
4 ≤ U < 7	A-B	B	C	E	F
7 ≤ U < 11	B	B-C	C	D	E
11 ≤ U < 13	C	C-D	D	D	D
13 ≤ U	C	D	D	D	D

The neutral class D should be assumed for overcast conditions, day or night.

"Strong" incoming solar radiation corresponds to a solar altitude greater than 60° with clear skies. "Slight" incoming solar radiation corresponds to a solar altitude of 15° to 35° with clear skies. Cloudiness will decrease incoming solar radiation and should be considered along with the solar altitude when determining the incoming solar radiation status. Incoming solar radiation that would be strong with clear skies can be expected to reduce to moderate with broken middle clouds (cloud cover of 5/8 to 7/8) and to slight with broken low clouds. Night refers to the period one hour before sunset to one hour after sunrise.

For "thinly overcast" conditions, the "> ½ low and < ½ cloud" refers to the percentage of cloud or sky overcast.

NOTE: To determine if there is lake effect wind, compare the wind direction at the inland tower to the wind direction at the main or backup tower. If the wind direction at the main or backup tower is easterly and the wind direction at the inland tower is westerly, the wind at the plant may be a lake effect breeze. If a lake breeze is suspected, the field monitoring teams must be advised to pay close attention to the wind direction.

- d. Enter the Xu/Q values for the site boundary, two miles, five miles, and ten miles from the site on Worksheet 2. The Xu/Q values can be taken from Table 6.

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 6
TABLE OF CENTERLINE X_u/Q VALUES VERSUS DISTANCE FROM THE SITE

(Units are m^{-2})

NOTE: To calculate the atmospheric dispersion factor, the centerline X_u/Q value is divided by the wind speed (in meters per second).

Stability Class	Site Boundary	Distance From the Site (miles)								
		2	3	4	5	6	7	8	9	10
A	4.43E-07	5.53E-08	3.93E-08	3.07E-08	2.54E-08	2.17E-08	1.90E-08	1.69E-08	1.53E-08	1.40E-08
B	4.99E-06	7.83E-07	1.92E-07	6.93E-08	3.21E-08	2.76E-08	2.42E-08	2.17E-08	1.96E-08	1.80E-08
C	1.91E-05	5.81E-06	2.94E-06	1.77E-06	1.21E-06	8.82E-07	6.90E-07	5.66E-07	4.72E-07	3.95E-07
D	5.99E-05	2.14E-05	1.17E-05	7.61E-06	5.48E-06	4.22E-06	3.39E-06	2.80E-06	2.37E-06	2.05E-06
E	1.14E-04	4.32E-05	2.47E-05	1.67E-05	1.24E-05	9.64E-06	7.79E-06	6.54E-06	5.70E-06	5.06E-06
F	2.40E-04	9.86E-05	5.91E-05	4.12E-05	3.12E-05	2.49E-05	2.08E-05	1.78E-05	1.55E-05	1.37E-05
G	4.65E-04	2.21E-04	1.36E-04	9.56E-05	7.30E-05	5.89E-05	4.94E-05	4.24E-05	3.72E-05	3.31E-05
Lake Breeze	4.54E-05	2.35E-05	1.31E-05	1.02E-05	8.37E-06	7.07E-06	6.33E-06	5.74E-06	5.11E-06	4.75E-06

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- e. **IF** a possible location other than the standard specified location is wanted, **THEN** enter the Xu/Q value for that distance from Table 6 on Worksheet 2.

Example:

The Xu/Q value for Class C stability @ 5 miles is 1.21E-06 m⁻². Calculate the X/Q values by dividing the Xu/Q value by the wind speed (in meters per second). This can be represented by the equation:

$$\frac{X}{Q} \left(\frac{\text{sec}}{\text{m}^3} \right) = 2.24 \left(\frac{\text{sec-mile}}{\text{hr-m}} \right) \times \frac{X_u/Q \text{ (m}^{-2}\text{)}}{\text{Wind Speed (miles/hr)}}$$

Enter the X/Q values on Worksheet 2.

- f. Sign and date Worksheet 2 and fax upon completion to the Dose/PAR Coordinator.

5.4.3 Whole Body Estimate (Worksheet 3)

- a. Enter the accident type on Worksheet 3. If the accident type is unknown, assume the accident type is a LOCA.
- b. Enter the gross release rate from Worksheet 2, Item 9, on Worksheet 3.

NOTE: The activity fractions are dependent on the accident type, the time from shutdown, whether containment spray was used, and, for steam generator tube rupture accidents, whether the release was through the condenser. Select only those activity fractions that are **bolded**.

- c. Enter the activity fractions on Worksheet 3 for the selected accident type. Activity fractions are listed in Table 7.
- d. Enter the X/Q value for the desired distance from Worksheet 2, Item 12, on Worksheet 3.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

WORKSHEET 3
ESTIMATED WHOLE BODY DOSE

Complete this form every two hours during a release or whenever changing radiological or meteorological conditions.

Accident type : LOCA Gap Activity Fuel Handling SG Tube Rupture Other

Calculate the projected whole body dose using the equation: SECTOR _____

DISTANCE _____ miles

$$\text{Dose}_i = Q \times F_i \times \frac{X}{Q} \times \text{DCF}_i \times \text{ERD}$$

TIME _____

where: Dose_i is the whole body dose due to radionuclide i, rem;
 Q is the gross release rate, curies/s.
 F_i is the activity fraction for radionuclide i, dimensionless. Activity fractions for radionuclides released in the LOCA, Gap Activity, Fuel Handling, and Steam Generator Tube Rupture accident types are listed in Table 7. The activity fractions for those radionuclides that contribute more than 90 percent of the total dose are printed in **bold** type. Those radionuclides that are **NOT** printed in bold type need **NOT** be included in the dose calculations.
 X/Q is the atmospheric dispersion factor, s/m^3 ;
 DCF_i is the whole body dose conversion factor for the radionuclide i, $\text{rem-m}^3/\text{Ci-hr}$;
 ERD is the estimated duration of the release, hours. (If unknown, assume 4 hours.)

Nuclide	Q	F_i	X/Q	DCF_i	ERD	Dose_i
I-131				5.3E+04		
I-132				4.9E+04		
I-133				1.5E+04		
I-134				3.1E+04		
I-135				8.1E+03		
Kr-85				1.3E+00		
Kr-85m				9.3E+01		
Kr-87				5.1E+02		
Kr-88				1.3E+03		
Rb-88				5.2E+02		
Cs-138				1.6E+03		
Xe-131m				4.9E+00		
Xe-133				2.0E+01		
Xe-133m				1.7E+01		
Xe-135				1.4E+02		
Xe-135m				2.5E+02		
Xe-138				7.2E+02		
Total Dose						

NOTE: Dose at other distances can be calculated by ratioing the X/Q values and multiplying by the dose calculated above.

Completed By: _____ Date/Time _____ / _____

Route to Dose/PAR Coordinator upon completion.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- e. Enter the estimated release duration (ERD), in hours, from Worksheet 2, Item 8, on Worksheet 3.
- f. Calculate the projected whole body (WB) dose on Worksheet 3 using the equation:

$$\text{Dose}_{i, \text{ whole body}} = Q \times F_i \times \frac{X}{Q} \times \text{DCF}_i \times \text{ERD}$$

where:

$$\text{Dose}_{i, \text{ whole body}} = \text{whole body dose, rem;}$$

$$F_i = \text{activity fraction for radionuclide } i, \text{ dimensionless. Activity fractions for radionuclides released in the LOCA, Gap Activity, Fuel Handling, and Steam Generator Tube Rupture accident types for various time periods post accident are listed in Table 7. The activity fractions for those radionuclides that contribute more than 90 percent of the total dose are bolded. Those radionuclides that are NOT bolded need NOT be included in the dose calculations.}$$

$$Q = \text{gross release rate, curies per second;}$$

$$X/Q = \text{atmospheric dispersion factor, seconds per m}^3;$$

$$\text{DCF}_i = \text{whole body dose conversion factor for nuclide } i, \text{ rem-m}^3/\text{Ci-hr;}$$

$$\text{ERD} = \text{estimated duration of the release, hours.}$$

- g. Sum the calculated doses and enter it on Worksheet 3.
- h. Sign and date Worksheet 3 and fax to the Dose/PAR Coordinator.

5.4.4 Thyroid Dose Estimate (Worksheet 4)

NOTE: If the type of accident is unknown, then assume the accident type is a LOCA.

- a. Enter the accident type on Worksheet 4.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

WORKSHEET 4
ESTIMATED THYROID DOSE

Complete this form every two hours during a release or whenever changing radiological or meteorological conditions.

Accident type : LOCA Gap Activity Fuel Handling SG Tube Rupture Other

Calculate the projected whole body dose using the equation: SECTOR _____
DISTANCE _____ miles
Dose_i = $Q \times F_i \times \frac{X}{Q} \times DCF_i \times ERD$ TIME _____

where: Dose_i is the thyroid dose due to radionuclide i, rem;
Q is the gross release rate, curies/s.
F_i is the activity fraction for radionuclide i, dimensionless. Activity fractions for radionuclides released in the LOCA, Gap Activity, Fuel Handling, and Steam Generator Tube Rupture accident types are listed in Table 7. The activity fractions for those radionuclides that contribute more than 90 percent of the total dose are underlined. Those radionuclides that are **NOT** underlined need **NOT** be included in the dose calculations.
X/Q is the atmospheric dispersion factor, s/m³;
DCF_i is the whole body dose conversion factor for the radionuclide i, rem-m³/Ci-hr;
ERD is the estimated duration of the release, hours. (If unknown, assume 4 hours.)

Nuclide	Q	F _i	X/Q	DCF _i	ERD	Dose _i
I-131	_____	_____	_____	1.3E+06	_____	_____
I-132	_____	_____	_____	7.7E+03	_____	_____
I-133	_____	_____	_____	2.2E+05	_____	_____
I-134	_____	_____	_____	1.3E+03	_____	_____
I-135	_____	_____	_____	3.8E+04	_____	_____

Total Dose _____

NOTE: Dose at other distances can be calculated by ratioing the X/Q values and multiplying by the dose calculated above.

Completed By: _____ Date/Time _____ / _____

Route to Dose/PAR Coordinator upon completion.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- b. Enter the gross release rate from Worksheet 2, Item 9, on Worksheet 4.

NOTE: The activity fractions are dependent on the accident type, the time from shutdown, whether containment spray was used, and, for steam generator tube rupture accidents, whether the release was through the condenser. Select only those activity fractions that are underlined.

- c. Enter the activity fractions on Worksheet 4 for the selected accident type. Activity fractions are listed in Table 7.
- d. Enter the X/Q value for the desired distance from Worksheet 2, Item 12, on Worksheet 4.
- e. Enter the estimated duration of the release (ERD), in hours, from Worksheet 2, Item 8, on Worksheet 4.
- f. Calculate the projected thyroid dose on Worksheet 4 using the equation:

$$Dose_{i, \text{thyroid}} = Q \times F_i \times \frac{X}{Q} \times DCF_i \times ERD$$

where:

$$Dose_{i, \text{thyroid}} = \text{thyroid dose, rem;}$$

$$Q = \text{release rate for nuclide i, curies per second;}$$

$$F_i = \text{activity fraction for radionuclide i, dimensionless. Activity fractions for radionuclides released in the LOCA, Gap Activity, Fuel Handling, and Steam Generator Tube Rupture accident types for various time periods post accident are listed in Table 7. The activity fractions for those radionuclides that contribute more than 90 percent of the total dose are underlined. Those radionuclides that are **NOT** underlined need **NOT** be included in the dose calculations.}$$

$$X/Q = \text{atmospheric dispersion factor, seconds per m}^3;$$

$$DCF_i = \text{thyroid dose conversion factor for nuclide i, rem-m}^3/\text{Ci-hr;}$$

$$ERD = \text{estimated duration of the release, hours.}$$

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- g. Sum the calculated doses and enter it on Worksheet 4.
- h. Sign and date Worksheet 4 and fax to Dose/PAR Coordinator.

5.4.5 Radionuclide Ground Deposition Estimation (Worksheet 5)

NOTE: If the type of accident is unknown, then assume the accident type is a LOCA.

- a. Enter the accident type on Worksheet 5.
- b. Enter the gross release rate from Worksheet 2, Item 9, on Worksheet 5.

NOTE: The activity fractions are dependent on the accident type, the time from shutdown, whether containment spray was used, and, for steam generator tube rupture accidents, whether the release was through the condenser. Select only those activity fractions that are bolded.

- c. Enter the activity fractions on Worksheet 5 for the selected accident type. Activity fractions are listed in Table 7.
- d. Enter the X/Q value from Worksheet 2, Item 12, for the desired distance on Worksheet 5.
- e. Enter the estimated release duration (ERD), in hours, from Worksheet 2, Item 8, on Worksheet 5.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

WORKSHEET 5
ESTIMATED GROUND DEPOSITION

Complete this form every six hours during a release or whenever changing radiological or meteorological conditions.

Accident type : LOCA Gap Activity Fuel Handling SG Tube Rupture Other

Calculate the projected ground deposition using the equation: SECTOR _____

DISTANCE _____ miles

$$Dep_i = Q \times F_i \times \frac{X}{Q} \times Vel_i \times ERD \times 3600$$

TIME _____

where: Dep_i is the deposition of radionuclide i, curies/m²;
 Q is the gross release rate, curies/s.
 F_i is the activity fraction for radionuclide i, dimensionless. Activity fractions for radionuclides released in the LOCA, Gap Activity, Fuel Handling, and Steam Generator Tube Rupture accident types are listed in Table 7.
 X/Q is the atmospheric dispersion factor, s/m³;
 Vel_i is the deposition velocity for radionuclide i, m/s;
 ERD is the estimated duration of the release, hours. (If unknown, assume 4 hours.)
 3600 is the factor to convert hours to seconds.

Nuclide	Q	F_i	X/Q	Vel_i	ERD	Dep_i
I-131	_____	_____	_____	0.01	_____	_____
I-132	_____	_____	_____	0.01	_____	_____
I-133	_____	_____	_____	0.01	_____	_____
I-134	_____	_____	_____	0.01	_____	_____
I-135	_____	_____	_____	0.01	_____	_____
Rb-88	_____	_____	_____	0.001	_____	_____
Cs-138	_____	_____	_____	0.001	_____	_____

Total Dose _____

NOTE: Deposition at other distances can be calculated by ratioing the X/Q values and multiplying by the deposition calculated above.

Completed By: _____ Date/Time _____ / _____

Route to Dose/PAR Coordinator upon completion.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- f. Calculate the ground deposition values using the equation:

$$\text{Dep}_i = Q \times F_i \times \frac{X}{Q} \times \text{Vel}_i \times \text{ERD} \times 3600$$

where:

Dep_i	=	deposition of radionuclide i, curies per meter ² ;
Q	=	gross release rate, curies per second;
F_i	=	activity fraction for radionuclide i, dimensionless. Activity fractions for radionuclides released in the LOCA, Gap Activity, Fuel Handling, and Steam Generator Tube Rupture accident types for various time periods post accident are listed in Table 7.
X/Q	=	atmospheric dispersion factor, seconds per m ³ ;
Vel_i	=	deposition velocity of radionuclide i, 0.01 m/s for radioiodines and 0.001 m/s for all other radionuclides;
ERD	=	estimated duration of the release, hours;
3600	=	factor to convert hours to seconds.

- g. Sum the calculated depositions and enter it on Worksheet 5.
h. Sign and date Worksheet 5 and fax to the Dose/PAR Coordinator.

5.4.6 Population Exposure (Worksheet 6)

- a. Calculate the projected population dose by using Worksheet 6.
b. Enter the centerline whole body dose from Worksheet 3, on Worksheet 6.
c. Enter the population figures. Use the population numbers for the sector and distance categories used in the dose calculations.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

WORKSHEET 6
ESTIMATED POPULATION DOSE

Complete this form using the calculation from Worksheet 3.

Complete this form every six hours during a release or whenever changing radiological or meteorological conditions.

Calculated Population Dose

Population dose (in person-rem) = Dose (in rem) X Population

<u>Sector</u>	<u>Distance (miles)</u>	<u>Population</u>	<u>Dose (rem)</u>	<u>Population Dose (person-rem)</u>
_____	2	_____	_____	_____
_____	5	_____	_____	_____
_____	10	_____	_____	_____
Total Dose				_____

Population Figures
(By Sector and Distance)

<u>Sector</u>	<u>0 to 2 miles</u>	<u>Distance 2 to 5 miles</u>	<u>5 to 10 miles</u>
A	0	20	231
H	33	45	0
J	19	231	6036
K	22	131	4866
L	15	606	879
M	32	980	632
N	39	403	695
P	29	345	450
Q	41	286	416
R	22	87	435

NOTE: All other sectors have zero population.

Completed By: _____ Date/Time _____ / _____

Route to Dose/PAR Coordinator upon completion.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

d. Sum the population doses calculated for each radius to calculate the total population dose.

e. Sign and date Worksheet 6 and fax to the Dose/PAR Coordinator.

5.4.7 Determine Protective Action Recommendations

NOTE: Lake breeze conditions exist if the difference between actual wind direction values for inland and near shore meteorological towers is greater than 90°.

a. To determine protective action recommendations, evaluate the calculation results with the values in the "Integrated Projected Dose" column below.

INTEGRATED PROJECTED DOSE	PROTECTIVE ACTION	MILES	SECTORS
<1 rem TEDE AND <5 rem CDE at 1 mile	None Required	N/A	N/A
≥1 rem TEDE at 1 mile OR >5 rem CDE at 1 mile	Evacuate Evacuate	0-2 Miles 2-5 Miles	All (360°) Downwind Sectors
<3 mph Wind Speed OR Lake Breeze AND ≥1 rem TEDE at 1 mile OR >5 rem CDE at 1 mile	Evacuate	0-5 Miles	All (360°)
≥1 rem TEDE at 5 miles OR >5 rem CDE at 5 miles	Evacuate Evacuate	0-5 Miles 5-10 Miles	All (360°) Downwind Sectors
<3 mph Wind Speed OR Lake Breeze AND ≥1 rem TEDE at 5 miles OR >5 rem CDE at 5 miles	Evacuate	0-10 Miles	All (360°)

b. Select downwind sectors using Attachment A.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- 5.4.8 **IF** a General Emergency,
THEN evaluate Attachment B for the potential need to issue expanded PARs.
- 5.4.9 Compare the results against the current classification and PARS.
IF the results of this assessment is an escalation of classification and/or PARS,
THEN immediately inform the Emergency Director and assist with EPIP 2.1 for initiating notifications.

Performed By:

Performer (Print and Sign)

Date / Time

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
LOCA SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY NOT USED
Page 1 of 8

Time	I-131	I-132	I-133	I-134	I-135	Kr-85	Kr-85m	Kr-87	Kr-88	Rb-88	Cs-138
0.0	2.46E-02	3.52E-02	5.51E-02	6.42E-02	5.10E-02	0.001	0.043	0.083	0.117	0.000	0.000
0.5	2.75E-02	3.40E-02	6.07E-02	4.82E-02	5.43E-02	0.001	0.044	0.071	0.116	0.084	0.057
1.0	3.08E-02	3.25E-02	6.70E-02	3.61E-02	5.79E-02	0.001	0.046	0.061	0.115	0.113	0.053
1.5	3.40E-02	3.09E-02	7.27E-02	2.69E-02	6.08E-02	0.001	0.047	0.051	0.112	0.120	0.037
2.0	3.69E-02	2.88E-02	7.80E-02	1.96E-02	6.27E-02	0.001	0.047	0.042	0.108	0.119	0.024
2.5	3.96E-02	2.66E-02	8.24E-02	1.41E-02	6.39E-02	0.001	0.047	0.035	0.103	0.114	0.014
3.0	4.20E-02	2.42E-02	8.58E-02	1.01E-02	6.43E-02	0.001	0.046	0.028	0.097	0.108	0.008
4.0	4.63E-02	1.97E-02	9.19E-02	4.99E-03	6.42E-02	0.001	0.043	0.018	0.083	0.093	0.003
5.0	5.00E-02	1.57E-02	9.64E-02	2.44E-03	6.27E-02	0.002	0.040	0.011	0.070	0.079	0.001
6.0	5.33E-02	1.24E-02	9.97E-02	1.17E-03	6.07E-02	0.002	0.037	0.007	0.059	0.066	0.000
7.0	5.62E-02	9.65E-03	1.02E-01	5.58E-04	5.79E-02	0.002	0.033	0.004	0.049	0.054	0.000
8.0	5.90E-02	7.47E-03	1.03E-01	2.64E-04	5.49E-02	0.002	0.030	0.003	0.040	0.045	0.000
9.0	6.13E-02	5.73E-03	1.05E-01	1.24E-04	5.16E-02	0.002	0.027	0.002	0.033	0.036	0.000
10.0	6.35E-02	4.39E-03	1.05E-01	5.80E-05	4.84E-02	0.002	0.024	0.001	0.026	0.030	0.000
12.0	6.74E-02	2.54E-03	1.04E-01	1.25E-05	4.20E-02	0.002	0.018	0.000	0.017	0.019	0.000
18.0	7.60E-02	4.64E-04	9.81E-02	1.19E-07	2.59E-02	0.003	0.008	0.000	0.004	0.005	0.000
24.0	8.19E-02	8.11E-05	8.82E-02	1.08E-09	1.53E-02	0.003	0.004	0.000	0.001	0.001	0.000
30.0	8.65E-02	1.39E-05	7.76E-02	0.000	8.88E-03	0.003	0.001	0.000	0.000	0.000	0.000
36.0	9.02E-02	2.36E-06	6.73E-02	0.000	5.08E-03	0.003	0.001	0.000	0.000	0.000	0.000
42.0	9.34E-02	3.96E-07	5.81E-02	0.000	2.88E-03	0.003	0.000	0.000	0.000	0.000	0.000
48.0	9.60E-02	6.60E-08	4.97E-02	0.000	1.62E-03	0.004	0.000	0.000	0.000	0.000	0.000
72.0	1.04E-01	0.000	2.58E-02	0.000	1.59E-04	0.004	0.000	0.000	0.000	0.000	0.000
96.0	1.10E-01	0.000	1.31E-02	0.000	1.51E-05	0.005	0.000	0.000	0.000	0.000	0.000
120.0	1.15E-01	0.000	6.58E-03	0.000	1.43E-06	0.005	0.000	0.000	0.000	0.000	0.000
144.0	1.20E-01	0.000	3.30E-03	0.000	1.35E-07	0.006	0.000	0.000	0.000	0.000	0.000
168.0	1.25E-01	0.000	1.65E-03	0.000	1.27E-08	0.007	0.000	0.000	0.000	0.000	0.000
336.0	1.63E-01	0.000	1.28E-05	0.000	0.000	0.017	0.000	0.000	0.000	0.000	0.000
504.0	2.06E-01	0.000	9.49E-08	0.000	0.000	0.039	0.000	0.000	0.000	0.000	0.000
672.0	2.49E-01	0.000	0.000	0.000	0.000	0.086	0.000	0.000	0.000	0.000	0.000
720.0	2.60E-01	0.000	0.000	0.000	0.000	0.106	0.000	0.000	0.000	0.000	0.000

- Notes:
1. The activity fractions that are **NOT** highlighted contribute less than ten percent of the whole body dose.
 2. The activity fractions that are **NOT** underlined contribute less than ten percent of the thyroid dose.
 3. Radionuclides that do **NOT** appear in the table contribute less than ten percent of the whole body and thyroid dose totals.

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
LOCA SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY USED
Page 2 of 8

Time	I-131	I-133	Kr-87	Kr-88	Xe-133	Xe-135	Xe-135m	Xe-138	Rb-88	Cs-138
0.0	3.19E-06	7.16E-06	1.08E-01	1.52E-01	2.85E-01	6.08E-02	7.73E-02	2.52E-01	0.00	0.00
0.5	3.55E-06	7.82E-06	9.17E-02	1.50E-01	3.17E-01	6.92E-02	3.86E-02	8.57E-02	1.09E-01	7.34E-02
1.0	3.97E-06	8.64E-06	7.84E-02	1.48E-01	3.55E-01	7.80E-02	2.81E-02	2.93E-02	1.46E-01	6.84E-02
1.5	4.39E-06	9.38E-06	6.60E-02	1.45E-01	3.92E-01	8.64E-02	2.59E-02	9.90E-03	1.55E-01	4.83E-02
2.0	4.77E-06	1.01E-05	5.47E-02	1.40E-01	4.26E-01	9.36E-02	2.57E-02	3.30E-03	1.54E-01	3.04E-02
2.5	5.12E-06	1.07E-05	4.48E-02	1.33E-01	4.57E-01	1.00E-01	2.59E-02	1.08E-03	1.47E-01	1.80E-02
3.0	5.43E-06	1.11E-05	3.62E-02	1.25E-01	4.85E-01	1.06E-01	2.60E-02	3.51E-04	1.39E-01	1.03E-02
4.0	5.99E-06	1.19E-05	2.32E-02	1.07E-01	5.34E-01	1.15E-01	2.60E-02	3.61E-05	1.20E-01	3.24E-03
5.0	6.47E-06	1.25E-05	1.46E-02	9.08E-02	5.77E-01	1.22E-01	2.54E-02	3.65E-06	1.02E-01	9.70E-04
6.0	6.89E-06	1.29E-05	9.04E-03	7.63E-02	6.14E-01	1.27E-01	2.45E-02	3.63E-07	8.52E-02	2.87E-04
7.0	7.26E-06	1.32E-05	5.54E-03	6.26E-02	6.47E-01	1.30E-01	2.33E-02	0.00	7.03E-02	8.39E-05
8.0	7.61E-06	1.34E-05	3.37E-03	5.15E-02	6.77E-01	1.32E-01	2.21E-02	0.00	5.76E-02	2.41E-05
9.0	7.90E-06	1.35E-05	2.03E-03	4.19E-02	7.02E-01	1.33E-01	2.08E-02	0.00	4.69E-02	6.93E-06
10.0	8.16E-06	1.34E-05	1.22E-03	3.39E-02	7.25E-01	1.33E-01	1.94E-02	0.00	3.79E-02	1.98E-06
12.0	8.60E-06	1.33E-05	4.36E-04	2.19E-02	7.63E-01	1.30E-01	1.67E-02	0.00	2.46E-02	1.59E-07
18.0	9.50E-06	1.23E-05	1.86E-05	5.61E-03	8.37E-01	1.09E-01	1.01E-02	0.00	6.27E-03	0.00
24.0	1.01E-05	1.08E-05	7.60E-07	1.37E-03	8.81E-01	8.41E-02	5.88E-03	0.00	1.53E-03	0.00
30.0	1.05E-05	9.38E-06	3.05E-08	3.31E-04	9.10E-01	6.22E-02	3.35E-03	0.00	3.70E-04	0.00
36.0	1.08E-05	8.04E-06	0.00	7.89E-05	9.30E-01	4.45E-02	1.90E-03	0.00	8.81E-05	0.00
42.0	1.10E-05	6.87E-06	0.00	1.87E-05	9.45E-01	3.14E-02	1.06E-03	0.00	2.10E-05	0.00
48.0	1.13E-05	5.83E-06	0.00	4.41E-06	9.56E-01	2.17E-02	5.94E-04	0.00	4.93E-06	0.00
72.0	1.20E-05	2.96E-06	0.00	1.34E-06	9.75E-01	4.53E-03	5.70E-05	0.00	0.00	0.00
96.0	1.25E-05	1.49E-06	0.00	0.00	9.80E-01	8.84E-04	5.38E-06	0.00	0.00	0.00
120.0	1.31E-05	7.49E-07	0.00	0.00	9.82E-01	1.67E-04	5.08E-07	0.00	0.00	0.00
144.0	1.37E-05	3.77E-07	0.00	0.00	9.83E-01	3.14E-05	0.00	0.00	0.00	0.00
168.0	1.43E-05	0.00	0.00	0.00	9.83E-01	5.84E-06	0.00	0.00	0.00	0.00
336.0	1.95E-05	0.00	0.00	0.00	9.75E-01	0.00	0.00	0.00	0.00	0.00
504.0	2.59E-05	0.00	0.00	0.00	9.46E-01	0.00	0.00	0.00	0.00	0.00
672.0	3.32E-05	0.00	0.00	0.00	8.78E-01	0.00	0.00	0.00	0.00	0.00
720.0	3.51E-05	0.00	0.00	0.00	8.48E-01	0.00	0.00	0.00	0.00	0.00

- Notes:
1. The activity fractions that are **NOT** highlighted contribute less than ten percent of the whole body dose.
 2. The activity fractions that are **NOT** underlined contribute less than ten percent of the thyroid dose.
 3. Radionuclides that do **NOT** appear in the table contribute less than ten percent of the whole body and thyroid dose totals.

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
GAP ACTIVITY RELEASE SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY NOT USED
Page 3 of 8

Time	I-131	I-133	I-135	Kr-85m	Kr-87	Kr-88	Xe-133	Xe-135	Xe-138	Rb-88	Cs-138
0.0	<u>6.34E-04</u>	<u>1.42E-03</u>	1.31E-03	0.055	0.108	0.151	0.284	0.060	0.250	0.000	0.000
0.5	<u>7.18E-04</u>	<u>1.58E-03</u>	1.41E-03	0.057	0.093	0.151	0.322	0.067	0.086	0.110	0.074
1.0	<u>8.11E-04</u>	<u>1.76E-03</u>	1.51E-03	0.060	0.080	0.151	0.361	0.074	0.030	0.148	0.069
1.5	<u>9.01E-04</u>	<u>1.92E-03</u>	1.60E-03	0.062	0.068	0.149	0.402	0.080	0.010	0.159	0.049
2.0	<u>9.82E-04</u>	<u>2.07E-03</u>	1.66E-03	0.062	0.056	0.144	0.439	0.084	3.38E-03	0.158	0.031
2.5	<u>1.06E-03</u>	<u>2.20E-03</u>	1.71E-03	0.062	0.046	0.137	0.471	0.088	1.12E-03	0.153	0.019
3.0	<u>1.13E-03</u>	<u>2.31E-03</u>	1.73E-03	0.062	0.038	0.129	0.502	0.090	3.63E-04	0.144	0.011
4.0	<u>1.25E-03</u>	<u>2.48E-03</u>	1.73E-03	0.058	0.024	0.112	0.558	0.093	3.75E-05	0.125	0.003
5.0	<u>1.36E-03</u>	<u>2.62E-03</u>	1.70E-03	0.055	0.015	0.096	0.605	0.094	3.82E-06	0.107	0.001
6.0	<u>1.46E-03</u>	<u>2.73E-03</u>	1.66E-03	0.050	0.010	0.081	0.646	0.094	3.84E-07	0.090	0.000
7.0	<u>1.55E-03</u>	<u>2.79E-03</u>	1.58E-03	0.045	0.006	0.067	0.685	0.093	0.000	0.075	0.000
8.0	<u>1.63E-03</u>	<u>2.85E-03</u>	1.50E-03	0.041	0.004	0.055	0.717	0.091	0.000	0.062	0.000
9.0	<u>1.69E-03</u>	<u>2.87E-03</u>	1.41E-03	0.037	0.002	0.045	0.747	0.088	0.000	0.050	0.000
10.0	<u>1.75E-03</u>	<u>2.89E-03</u>	1.33E-03	0.033	0.001	0.036	0.772	0.085	0.000	0.041	0.000
12.0	<u>1.85E-03</u>	<u>2.87E-03</u>	1.15E-03	0.025	0.000	0.024	0.813	0.078	0.000	0.026	0.000
18.0	<u>2.05E-03</u>	<u>2.65E-03</u>	6.96E-04	0.011	0.000	0.006	0.885	0.056	0.000	0.007	0.000
24.0	<u>2.15E-03</u>	<u>2.31E-03</u>	3.99E-04	0.005	0.000	0.001	0.919	0.038	0.000	0.002	0.000
30.0	<u>2.21E-03</u>	<u>1.97E-03</u>	2.26E-04	0.002	0.000	0.000	0.937	0.026	0.000	0.000	0.000
36.0	<u>2.26E-03</u>	<u>1.69E-03</u>	1.27E-04	0.001	0.000	0.000	0.948	0.017	0.000	0.000	0.000
42.0	<u>2.30E-03</u>	<u>1.42E-03</u>	7.06E-05	0.000	0.000	0.000	0.955	0.011	0.000	0.000	0.000
48.0	<u>2.33E-03</u>	<u>1.21E-03</u>	3.94E-05	0.000	0.000	0.000	0.959	7.47E-03	0.000	0.000	0.000
72.0	<u>2.46E-03</u>	6.09E-04	3.75E-06	0.000	0.000	0.000	0.967	1.40E-03	0.000	0.000	0.000
96.0	<u>2.56E-03</u>	3.07E-04	3.53E-07	0.000	0.000	0.000	0.968	2.59E-04	0.000	0.000	0.000
120.0	<u>2.68E-03</u>	1.54E-04	3.34E-08	0.000	0.000	0.000	0.968	4.81E-05	0.000	0.000	0.000
144.0	<u>2.80E-03</u>	7.72E-05	3.14E-09	0.000	0.000	0.000	0.967	8.85E-06	0.000	0.000	0.000
168.0	<u>2.93E-03</u>	3.86E-05	0.000	0.000	0.000	0.000	0.965	1.63E-06	0.000	0.000	0.000
336.0	<u>3.89E-03</u>	3.03E-07	0.000	0.000	0.000	0.000	0.933	1.16E-11	0.000	0.000	0.000
504.0	<u>4.91E-03</u>	2.26E-09	0.000	0.000	0.000	0.000	0.854	0.000	0.000	0.000	0.000
672.0	<u>5.57E-03</u>	0.000	0.000	0.000	0.000	0.000	0.704	0.000	0.000	0.000	0.000
720.0	<u>5.62E-03</u>	0.000	0.000	0.000	0.000	0.000	0.649	0.000	0.000	0.000	0.000

- Notes:
1. The activity fractions that are **NOT** highlighted contribute less than ten percent of the whole body dose.
 2. The activity fractions that are **NOT** underlined contribute less than ten percent of the thyroid dose.
 3. Radionuclides that do **NOT** appear in the table contribute less than ten percent of the whole body and thyroid dose totals.

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
GAP ACTIVITY RELEASE SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY USED
Page 4 of 8

Time	I-131	I-133	Kr-87	Kr-88	Xe-133	Xe-135	Xe-138	Rb-88	Cs-138
0.0	6.38E-08	1.43E-07	1.08E-01	1.52E-01	2.86E-01	6.06E-02	2.51E-01	0.00	0.00
0.5	7.22E-08	1.59E-07	9.31E-02	1.52E-01	3.24E-01	6.78E-02	8.67E-02	1.10E-01	7.45E-02
1.0	8.15E-08	1.77E-07	8.03E-02	1.52E-01	3.63E-01	7.46E-02	3.00E-02	1.49E-01	6.98E-02
1.5	9.06E-08	1.94E-07	6.81E-02	1.50E-01	4.04E-01	8.01E-02	1.02E-02	1.60E-01	4.95E-02
2.0	9.87E-08	2.08E-07	5.65E-02	1.44E-01	4.42E-04	8.45E-02	3.40E-03	1.59E-01	3.13E-02
2.5	1.07E-07	2.22E-07	4.66E-02	1.38E-01	4.74E-01	8.81E-02	1.12E-03	1.54E-01	1.87E-02
3.0	1.13E-07	2.32E-07	3.78E-02	1.30E-01	5.05E-01	9.04E-02	3.65E-04	1.45E-01	1.08E-02
4.0	1.26E-07	2.49E-07	2.44E-02	1.13E-01	5.61E-01	9.36E-02	3.78E-05	1.26E-01	3.38E-03
5.0	1.37E-07	2.63E-07	1.55E-02	9.64E-02	6.08E-01	9.48E-02	3.84E-06	1.08E-01	1.03E-03
6.0	1.47E-07	2.75E-07	9.64E-03	8.13E-02	6.50E-01	9.46E-02	0.00	9.06E-02	3.05E-04
7.0	1.56E-07	2.81E-07	5.92E-03	6.70E-02	6.89E-01	9.35E-02	0.00	7.50E-02	8.92E-05
8.0	1.64E-07	2.87E-07	3.62E-03	5.54E-02	7.21E-01	9.16E-02	0.00	6.19E-02	2.59E-05
9.0	1.70E-07	2.89E-07	2.19E-03	4.50E-02	7.51E-01	8.87E-02	0.00	5.04E-02	7.45E-06
10.0	1.76E-07	2.91E-07	1.32E-03	3.66E-02	7.76E-01	8.54E-02	0.00	4.10E-02	2.12E-06
12.0	1.86E-07	2.89E-07	4.71E-04	2.37E-02	8.18E-01	7.81E-02	0.00	2.66E-02	0.00
18.0	2.06E-07	2.66E-07	2.02E-05	6.07E-03	8.90E-01	5.65E-02	0.00	6.79E-03	0.00
24.0	2.16E-07	2.32E-07	0.00	1.47E-03	9.24E-01	3.85E-02	0.00	1.64E-03	0.00
30.0	2.22E-07	1.98E-07	0.00	3.50E-04	9.42E-01	2.58E-02	0.00	3.92E-04	0.00
36.0	2.27E-07	1.69E-07	0.00	8.29E-05	9.52E-01	1.71E-02	0.00	9.26E-05	0.00
42.0	2.31E-07	1.43E-07	0.00	1.95E-05	9.59E-01	1.14E-02	0.00	2.18E-05	0.00
48.0	2.34E-07	1.21E-07	0.00	4.58E-06	9.63E-01	7.50E-03	0.00	5.13E-06	0.00
72.0	2.46E-07	6.11E-08	0.00	0.00	9.70E-01	1.40E-03	0.00	0.00	0.00
96.0	2.57E-07	3.08E-08	0.00	0.00	9.71E-01	2.60E-04	0.00	0.00	0.00
120.0	2.69E-07	1.54E-08	0.00	0.00	9.71E-01	4.82E-05	0.00	0.00	0.00
144.0	2.81E-07	0.00	0.00	0.00	9.70E-01	8.88E-06	0.00	0.00	0.00
168.0	2.94E-07	0.00	0.00	0.00	9.68E-01	1.64E-06	0.00	0.00	0.00
336.0	3.90E-07	0.00	0.00	0.00	9.37E-01	0.00	0.00	0.00	0.00
504.0	4.93E-07	0.00	0.00	0.00	8.58E-01	0.00	0.00	0.00	0.00
672.0	5.60E-07	0.00	0.00	0.00	7.08E-01	0.00	0.00	0.00	0.00
720.0	5.65E-07	0.00	0.00	0.00	6.52E-01	0.00	0.00	0.00	0.00

- Notes:
1. The activity fractions that are **NOT** highlighted contribute less than ten percent of the whole body dose.
 2. The activity fractions that are **NOT** underlined contribute less than ten percent of the thyroid dose.
 3. Radionuclides that do **NOT** appear in the table contribute less than ten percent of the whole body and thyroid dose totals.

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
FUEL HANDLING ACCIDENT SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY NOT USED

Page 5 of 8

Time	I-131	I-132	I-133	I-134	I-135	Kr-85	Kr-85m	Kr-87	Xe-133	Rb-88	Cs-138
0.0	2.17E-03	0.000	2.59E-04	0.000	3.03E-07	0.014	0.000	0.000	0.963	0.000	0.000
0.5	2.17E-03	0.000	2.55E-04	0.000	2.88E-07	0.014	0.000	0.000	0.964	0.000	0.000
1.0	2.17E-03	0.000	2.52E-04	0.000	2.75E-07	0.014	0.000	0.000	0.964	0.000	0.000
1.5	2.17E-03	0.000	2.48E-04	0.000	2.62E-07	0.014	0.000	0.000	0.964	0.000	0.000
2.0	2.18E-03	0.000	2.45E-04	0.000	2.50E-07	0.014	0.000	0.000	0.964	0.000	0.000
2.5	2.18E-03	0.000	2.41E-04	0.000	2.37E-07	0.014	0.000	0.000	0.964	0.000	0.000
3.0	2.18E-03	0.000	2.38E-04	0.000	2.25E-07	0.015	0.000	0.000	0.964	0.000	0.000
4.0	2.18E-03	0.000	2.30E-04	0.000	2.05E-07	0.015	0.000	0.000	0.964	0.000	0.000
5.0	2.19E-03	0.000	2.24E-04	0.000	1.86E-07	0.015	0.000	0.000	0.964	0.000	0.000
6.0	2.19E-03	0.000	2.18E-04	0.000	1.69E-07	0.015	0.000	0.000	0.964	0.000	0.000
7.0	2.21E-03	0.000	2.12E-04	0.000	1.52E-07	0.015	0.000	0.000	0.964	0.000	0.000
8.0	2.21E-03	0.000	2.05E-04	0.000	1.38E-07	0.015	0.000	0.000	0.965	0.000	0.000
9.0	2.20E-03	0.000	2.00E-04	0.000	1.25E-07	0.015	0.000	0.000	0.965	0.000	0.000
10.0	2.22E-03	0.000	1.95E-04	0.000	1.13E-07	0.015	0.000	0.000	0.965	0.000	0.000
12.0	2.22E-03	0.000	1.83E-04	0.000	9.33E-08	0.015	0.000	0.000	0.965	0.000	0.000
18.0	2.25E-03	0.000	1.55E-04	0.000	5.18E-08	0.016	0.000	0.000	0.966	0.000	0.000
24.0	2.27E-03	0.000	1.30E-04	0.000	2.87E-08	0.016	0.000	0.000	0.966	0.000	0.000
30.0	2.31E-03	0.000	1.10E-04	0.000	1.60E-08	0.017	0.000	0.000	0.966	0.000	0.000
36.0	2.32E-03	0.000	9.24E-05	0.000	8.83E-09	0.017	0.000	0.000	0.966	0.000	0.000
42.0	2.35E-03	0.000	7.77E-05	0.000	4.89E-09	0.018	0.000	0.000	0.966	0.000	0.000
48.0	2.37E-03	0.000	6.53E-05	0.000	2.71E-09	0.019	0.000	0.000	0.966	0.000	0.000
72.0	2.48E-03	0.000	3.28E-05	0.000	0.000	0.021	0.000	0.000	0.965	0.000	0.000
96.0	2.59E-03	0.000	1.64E-05	0.000	0.000	0.024	0.000	0.000	0.963	0.000	0.000
120.0	2.71E-03	0.000	8.24E-06	0.000	0.000	0.027	0.000	0.000	0.961	0.000	0.000
144.0	2.82E-03	0.000	4.13E-06	0.000	0.000	0.031	0.000	0.000	0.958	0.000	0.000
168.0	2.94E-03	0.000	2.07E-06	0.000	0.000	0.035	0.000	0.000	0.955	0.000	0.000
336.0	3.84E-03	0.000	1.59E-08	0.000	0.000	0.084	0.000	0.000	0.907	0.000	0.000
504.0	4.66E-03	0.000	0.000	0.000	0.000	0.187	0.000	0.000	0.802	0.000	0.000
672.0	5.00E-03	0.000	0.000	0.000	0.000	0.364	0.000	0.000	0.623	0.000	0.000
720.0	4.92E-03	0.000	0.000	0.000	0.000	0.427	0.000	0.000	0.560	0.000	0.000

- Notes:
1. The activity fractions that are **NOT** highlighted contribute less than ten percent of the whole body dose.
 2. The activity fractions that are **NOT** underlined contribute less than ten percent of the thyroid dose.
 3. Radionuclides that do **NOT** appear in the table contribute less than ten percent of the whole body and thyroid dose totals.

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
FUEL HANDLING ACCIDENT SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY USED
Page 6 of 8

Time	I-131	Xe-133
0.0	2.17E-07	9.66E-01
0.5	2.18E-07	9.66E-01
1.0	2.17E-07	9.66E-01
1.5	2.18E-07	9.66E-01
2.0	2.19E-07	9.66E-01
2.5	2.18E-07	9.66E-01
3.0	2.19E-07	9.66E-01
4.0	2.20E-07	9.67E-01
5.0	2.20E-07	9.67E-01
6.0	2.20E-07	9.67E-01
7.0	2.21E-07	9.67E-01
8.0	2.21E-07	9.67E-01
9.0	2.21E-07	9.67E-01
10.0	2.22E-07	9.67E-01
12.0	2.22E-07	9.67E-01
18.0	2.26E-07	9.68E-01
24.0	2.28E-07	9.68E-01
30.0	2.31E-07	9.68E-01
36.0	2.33E-07	9.68E-01
42.0	2.36E-07	9.68E-01
48.0	2.37E-07	9.68E-01
72.0	2.49E-07	9.68E-01
96.0	2.59E-07	9.66E-01
120.0	2.71E-07	9.64E-01
144.0	2.83E-07	9.61E-01
168.0	2.94E-07	9.58E-01
336.0	3.85E-07	9.10E-01
504.0	4.68E-07	8.06E-01
672.0	5.02E-07	6.26E-01
720.0	4.94E-07	5.63E-01

- Notes:
1. The activity fractions that are **NOT** highlighted contribute less than ten percent of the whole body dose.
 2. The activity fractions that are **NOT** underlined contribute less than ten percent of the thyroid dose.
 3. Radionuclides that do **NOT** appear in the table contribute less than ten percent of the whole body and thyroid dose totals.

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
STEAM GENERATOR TUBE RUPTURE SOURCE TERM - - RELEASE MODE - THROUGH THE CONDENSER - ACTIVITY FRACTIONS
Page 7 of 8

Time	I-131	I-133	I-135	Kr-85	Kr-85m	Kr-88	Xe-133	Xe-135	Xe-138	Rb-88	Cs-138
0.0	3.92E-08	3.05E-08	3.16E-08	0.933	0.030	0.008	0.011	4.03E-03	0.013	0.000	0.000
0.5	3.93E-08	3.00E-08	3.02E-08	0.937	0.028	0.007	0.011	3.90E-03	0.004	4.90E-03	3.43E-03
1.0	3.94E-08	2.98E-08	2.88E-08	0.943	0.026	0.006	0.011	3.77E-03	1.24E-03	5.89E-03	2.87E-03
1.5	3.95E-08	2.94E-08	2.75E-08	0.947	0.024	0.005	0.011	3.65E-03	3.78E-04	5.71E-03	1.84E-03
2.0	3.96E-08	2.90E-08	2.61E-08	0.952	0.023	0.005	0.011	3.53E-03	1.16E-04	5.22E-03	1.06E-03
2.5	3.98E-08	2.86E-08	2.50E-08	0.955	0.021	0.004	0.011	3.41E-03	3.55E-05	4.67E-03	5.92E-04
3.0	3.97E-08	2.81E-08	2.37E-08	0.955	0.019	0.004	0.011	3.28E-03	1.08E-05	4.14E-03	3.20E-04
4.0	3.99E-08	2.74E-08	2.15E-08	0.963	0.017	0.003	0.011	3.08E-03	1.02E-06	3.27E-03	9.06E-05
5.0	3.99E-08	2.66E-08	1.95E-08	0.967	0.014	0.002	0.011	2.86E-03	9.51E-08	2.56E-03	2.54E-05
6.0	3.98E-08	2.58E-08	1.76E-08	0.970	0.012	0.002	0.011	2.66E-03	8.89E-09	2.01E-03	7.02E-06
7.0	3.99E-08	2.50E-08	1.59E-08	0.973	0.011	0.001	0.011	2.47E-03	0.00	1.57E-03	1.94E-06
8.0	3.98E-08	2.42E-08	1.44E-08	0.976	0.009	0.001	0.011	2.30E-03	0.00	1.23E-03	0.00
9.0	3.97E-08	2.35E-08	1.30E-08	0.978	0.008	0.001	0.010	2.14E-03	0.00	9.61E-04	0.00
10.0	3.96E-08	2.27E-08	1.18E-08	0.979	0.007	0.001	0.010	1.98E-03	0.00	7.53E-04	0.00
12.0	3.95E-08	2.13E-08	9.57E-09	0.982	0.005	0.00	0.010	1.71E-03	0.00	4.60E-04	0.00
18.0	3.89E-08	1.74E-08	5.17E-09	0.987	0.002	0.00	0.010	1.09E-03	0.00	1.04E-04	0.00
24.0	3.81E-08	1.42E-08	2.78E-09	0.989	0.001	0.00	9.80E-03	6.92E-04	0.00	2.38E-05	0.00
30.0	3.73E-08	1.16E-08	1.49E-09	0.990	0.00	0.00	9.48E-03	4.39E-04	0.00	5.38E-06	0.00
36.0	3.65E-08	9.48E-09	8.01E-10	0.990	0.00	0.00	9.24E-03	2.79E-04	0.00	1.22E-06	0.00
42.0	3.58E-08	7.72E-09	4.30E-10	0.991	0.00	0.00	8.91E-03	1.77E-04	0.00	0.00	0.00
48.0	3.51E-08	6.29E-09	0.00	0.991	0.00	0.00	8.66E-03	1.12E-04	0.00	0.00	0.00
72.0	3.22E-08	2.78E-09	0.00	0.992	0.00	0.00	7.57E-03	1.83E-05	0.00	0.00	0.00
96.0	2.95E-08	1.23E-09	0.00	0.993	0.00	0.00	6.64E-03	2.96E-06	0.00	0.00	0.00
120.0	2.71E-08	5.40E-10	0.00	0.994	0.00	0.00	5.83E-03	0.00	0.00	0.00	0.00
144.0	2.49E-08	2.38E-10	0.00	0.995	0.00	0.00	5.11E-03	0.00	0.00	0.00	0.00
168.0	2.28E-08	1.05E-10	0.00	0.996	0.00	0.00	4.48E-03	0.00	0.00	0.00	0.00
336.0	1.26E-08	3.40E-13	0.00	0.998	0.00	0.00	1.79E-03	0.00	0.00	0.00	0.00
504.0	6.87E-09	0.00	0.00	0.999	0.00	0.00	7.09E-04	0.00	0.00	0.00	0.00
672.0	3.80E-09	0.00	0.00	1.000	0.00	0.00	2.84E-04	0.00	0.00	0.00	0.00
720.0	3.19E-09	0.00	0.00	1.000	0.00	0.00	2.18E-04	0.00	0.00	0.00	0.00

- Notes:
1. The activity fractions that are **NOT** highlighted contribute less than ten percent of the whole body dose.
 2. The activity fractions that are **NOT** underlined contribute less than ten percent of the thyroid dose.
 3. Radionuclides that do **NOT** appear in the table contribute less than ten percent of the whole body and thyroid dose totals.

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
STEAM GENERATOR TUBE RUPTURE SOURCE TERM - - RELEASE MODE - NOT THROUGH THE CONDENSER - ACTIVITY FRACTIONS

Page 8 of 8

Time	I-131	I-133	I-135	Kr-85	Kr-85m	Kr-88	Xe-133	Xe-135	Xe-138	Rb-88	Cs-138
0.0	3.92E-04	3.05E-04	3.16E-04	0.933	0.030	0.008	0.011	4.03E-03	0.013	0.00	0.00
0.5	3.93E-04	3.00E-04	3.01E-04	0.937	0.028	0.007	0.011	3.90E-03	0.004	4.89E-03	3.43E-03
1.0	3.94E-04	2.98E-04	2.87E-04	0.943	0.026	0.006	0.011	3.77E-03	1.24E-03	5.89E-03	2.86E-03
1.5	3.95E-04	2.94E-04	2.74E-04	0.947	0.024	0.005	0.011	3.65E-03	3.78E-04	5.70E-03	1.84E-03
2.0	3.96E-04	2.90E-04	2.61E-04	0.952	0.023	0.005	0.011	3.53E-03	1.16E-04	5.22E-03	1.06E-03
2.5	3.98E-04	2.86E-04	2.49E-04	0.955	0.021	0.004	0.011	3.41E-03	3.55E-05	4.67E-03	5.91E-04
3.0	3.97E-04	2.81E-04	2.37E-04	0.955	0.019	0.004	0.011	3.28E-03	1.08E-05	4.14E-03	3.19E-03
4.0	3.99E-04	2.74E-04	2.15E-04	0.963	0.017	0.003	0.011	3.08E-03	1.02E-06	3.27E-03	9.05E-05
5.0	3.99E-04	2.66E-04	1.95E-04	0.967	0.014	0.002	0.011	2.86E-03	9.51E-08	2.56E-03	2.53E-05
6.0	3.98E-04	2.58E-04	1.76E-04	0.970	0.012	0.002	0.011	2.66E-03	8.89E-09	2.00E-03	7.01E-06
7.0	3.99E-04	2.50E-04	1.59E-04	0.973	0.011	0.001	0.011	2.47E-03	0.00	1.57E-03	1.94E-06
8.0	3.98E-04	2.42E-04	1.44E-04	0.976	0.009	0.001	0.011	2.30E-03	0.00	1.23E-03	0.00
9.0	3.97E-04	2.35E-04	1.30E-04	0.978	0.008	0.001	0.010	2.14E-03	0.00	9.60E-04	0.00
10.0	3.96E-04	2.27E-04	1.18E-04	0.979	0.007	0.001	0.010	1.98E-03	0.00	7.52E-04	0.00
12.0	3.95E-04	2.13E-04	9.57E-05	0.982	0.005	0.00	0.010	1.71E-03	0.00	4.59E-04	0.00
18.0	3.89E-04	1.74E-04	5.16E-05	0.987	0.002	0.00	0.010	1.09E-03	0.00	1.04E-04	0.00
24.0	3.81E-04	1.42E-04	2.77E-05	0.989	0.001	0.00	9.80E-03	6.92E-04	0.00	2.37E-05	0.00
30.0	3.73E-04	1.16E-04	1.49E-05	0.990	0.00	0.00	9.48E-03	4.39E-04	0.00	5.38E-06	0.00
36.0	3.65E-04	9.48E-05	8.00E-06	0.990	0.00	0.00	9.24E-03	2.79E-04	0.00	1.22E-06	0.00
42.0	3.58E-04	7.72E-05	4.29E-06	0.991	0.00	0.00	8.91E-03	1.77E-04	0.00	0.00	0.00
48.0	3.51E-04	6.29E-05	2.31E-06	0.991	0.00	0.00	8.66E-03	1.12E-04	0.00	0.00	0.00
72.0	3.22E-04	2.78E-05	0.00	0.992	0.00	0.00	7.57E-03	1.83E-05	0.00	0.00	0.00
96.0	2.95E-04	1.23E-05	0.00	0.993	0.00	0.00	6.64E-03	2.96E-06	0.00	0.00	0.00
120.0	2.71E-04	5.40E-06	0.00	0.994	0.00	0.00	5.83E-03	0.00	0.00	0.00	0.00
144.0	2.49E-04	2.38E-06	0.00	0.995	0.00	0.00	5.11E-03	0.00	0.00	0.00	0.00
168.0	2.28E-04	1.05E-06	0.00	0.996	0.00	0.00	4.48E-03	0.00	0.00	0.00	0.00
336.0	1.26E-04	3.40E-09	0.00	0.998	0.00	0.00	1.79E-03	0.00	0.00	0.00	0.00
504.0	6.87E-05	0.00	0.00	0.999	0.00	0.00	7.09E-04	0.00	0.00	0.00	0.00
672.0	3.80E-05	0.00	0.00	1.000	0.00	0.00	2.84E-04	0.00	0.00	0.00	0.00
720.0	3.19E-05	0.00	0.00	1.000	0.00	0.00	2.18E-04	0.00	0.00	0.00	0.00

- Notes:
1. The activity fractions that are **NOT** highlighted contribute less than ten percent of the whole body dose.
 2. The activity fractions that are **NOT** underlined contribute less than ten percent of the thyroid dose.
 3. Radionuclides that do **NOT** appear in the table contribute less than ten percent of the whole body and thyroid dose totals.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

6.0 REFERENCES

- 6.1 EDS Report to Wisconsin Electric Power Company concerning NUREG-0578, March 7, 1980.
- 6.2 EPIP 1.1, Course of Actions
- 6.3 EPIP 2.1, Notifications - ERO, State & Counties, and NRC
- 6.4 ETD 02, Offsite Agency Call List.
- 6.5 NUREG/BR-0150, Volume 1, Revision 4, RTM-96, Response Technical Manual, Figures A-5 and A-6, March 1996.
- 6.6 Radiation Monitoring System Alarm Setpoint & Response Book
- 6.7 Radiological Engineer to Plant Manager/EP Coordinator memo dated June 13, 1988.
- 6.8 Reactor Engineer to Plant Manager memo dated April 6, 1984.
- 6.9 TID 14844, Calculation of Distance Factors for Power and Test Reactor Sites, March 23, 1962.
- 6.10 U. S. NRC Regulatory Guide 1.109, Calculation of Annual Doses to Man from Routine Release of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, Revision 1, October 1977.
- 6.11 U. S. NRC Regulatory Guide 1.4, Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss-of Coolant Accident for Pressurized Water Reactors, Revision 2, June 1976.

7.0 BASES

- B-1 NUREG-0654, Revision 1, Supp. 3, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, July, 1996.
- B-2 Point Beach Nuclear Plant, Emergency Plan, Appendix J, Evacuation Time Estimates for the Area Surrounding the Point Beach Nuclear Plant.
- B-3 IE Information Notice No. 83-28, Criteria for Protective Action Recommendations for General Emergencies.
- B-4 EPA 400-R-92-001, Manual of Protective Action Guidelines for Nuclear Incidents, May, 1992.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

ATTACHMENT A
AFFECTED SECTORS BASED ON WIND DIRECTION

NOTE: If wind speed is less than three (3) mph or lake breeze conditions exist, then recommend protective actions for all sectors (360°) 0-5 miles. Lake breeze conditions exist if the difference between actual wind direction values for inland and near shore meteorological towers is greater than 90°.

<u>Wind Direction* (Degrees From)</u>	<u>Sectors in Downwind Area</u>
0 - 11	H, J, K
> 11 - 34	J, K, L
> 34 - 56	K, L, M
> 56 - 79	L, M, N
> 79 - 101	M, N, P
> 101 - 124	N, P, Q
> 124 - 146	P, Q, R
> 146 - 169	Q, R, A
> 169 - 191	R, A, (B)
> 191 - 214	A, (B), (C)
> 214 - 236	(B), (C), (D)
> 236 - 259	(C), (D), (E)
> 259 - 281	(D), (E), (F)
> 281 - 304	(E), (F), (G)
> 304 - 326	(F), (G), H
> 326 - 349	(G), H, J
> 349 - 360	H, J, K
> 360 - 371 **	H, J, K
> 371 - 394 **	J, K, L
> 394 - 416 **	K, L, M
> 416 - 434 **	L, M, N
> 434 - 461 **	M, N, P
> 461 - 484 **	N, P, Q
> 484 - 506 **	P, Q, R
> 506 - 520 **	Q, R, A

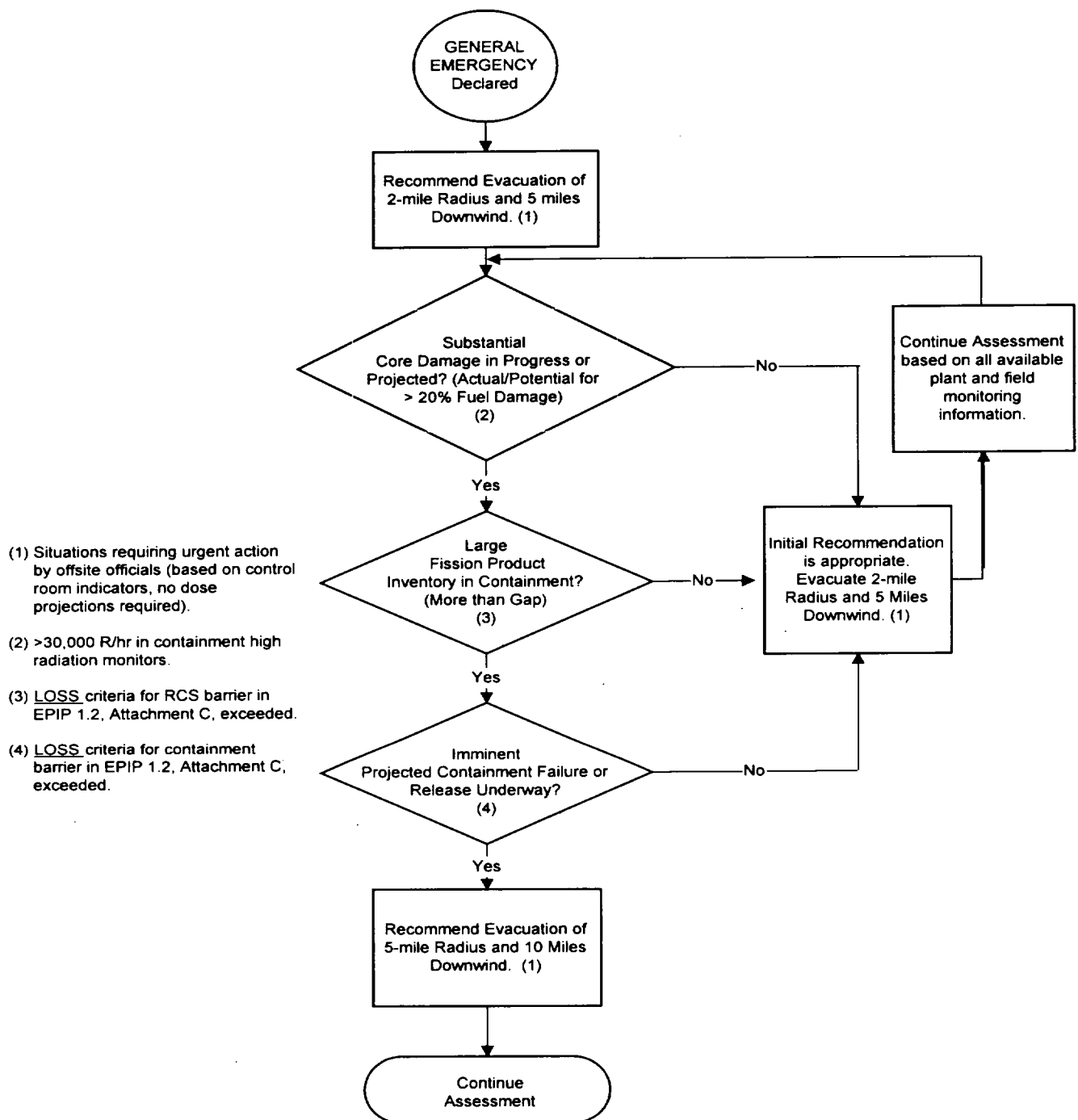
* As read on PPCS or control room instruments.

** As read on chart recorder.

() Denotes sectors over Lake Michigan.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

ATTACHMENT B
GENERAL EMERGENCY OFFSITE PROTECTIVE ACTIONS



DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

ATTACHMENT C
REINSTALLATION OF WEDAP SOFTWARE

1.0 NOTEBOOK PERSONAL COMPUTER (PC) ACCESS

The Wisconsin Electric Dose Assessment Program (WEDAP) is a resident of the hard drive of the Level A notebook personal computers (PC) in the Control Room and EOF (TSC as a backup) dose assessment areas. The directory location is "J:\Apps\NP\WEDAP."

- 1.1 **IF** the WEDAP directory and files are **NOT** found on the hard drive of the notebook PC in the EOF (TSC),
THEN the notebook PC must be recloned and WEDAP reinstalled using the CD-Roms located in the EOF (TSC) inventory cabinet.

1.1.1 Recloning the notebook PC

- a. Insert the cloning "Install" CD-Rom.
- b. Reboot the notebook PC.
- c. Wait for the prompt, following any instruction prompts given.

1.1.2 Installing WEDAP from the cloning CD.

- a. Insert the "WEDAP" application CD-Rom.
- b. Select the "Start Bar - Enterprise Applications - Application Install - Install/Update Application" (top choice).
- c. Click on "Install" to run the auto-install.

- 1.2 Return to EPIP 1.3, Step 5.1.1
OR IF WEDAP is still unavailable,
THEN perform manual calculations per EPIP 1.3, Step 5.4.

2.0 PRINTING DATA TO LOCAL PRINTER IN THE EOF (TSC)

- 2.1 Ensure the laserjet printer in the EOF (TSC) is connected to the notebook PC via the printer cable and the printer is in the "ON" position.
- 2.2 From WEDAP, select "File - Print" **OR** the "Printer Icon" to print a case.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- 2.3 Return to EPIP 1.3, Step 5.1.20 IF able to print.
- 2.4 IF still unable to print,
THEN reset the printer connection.
 - 2.4.1 Select "Start - Settings - Printers - HP LaserJet 4000" and verify the printer properties have LPT1 selected for the port connection.
 - 2.4.2 From WEDAP, select "File - Print" OR the "Printer Icon" to print a case.
 - 2.4.3 Return to EPIP 1.3, Step 5.1.20 IF able to print.
- 2.5 IF still unable to print,
THEN reinstall the printer drivers.
 - 2.5.1 Obtain the cloning "Install" CD-Rom from the EOF (TSC) inventory cabinet and place in the notebook PC while still logged on.
 - 2.5.2 Select Start - Settings - Printers
 - 2.5.3 Execute "Add Local Printer"
 - 2.5.4 Select "My Computer" and "Next" arrow
 - 2.5.5 Select "LPT1" local port and "Next" arrow
 - 2.5.6 At "Add Print Wizard" select "Have Disk...."
 - 2.5.7 At "Install From Disk" select "Browse..."
 - 2.5.8 When message of "A:\ Isn't Accessible" select "Cancel"
 - 2.5.9 At "Local File Window" Select "My Computer"
 - 2.5.10 Select "D:\Prntdrvs\1386\HP4000~1\PC16\Oemnt40.inf" OR other appropriate printer.
 - 2.5.11 Select "OK" at "Install from Disk"
 - 2.5.12 Select "HP LaserJet 4000 Series PCL 6" OR other appropriate printer and "Next" arrow.
 - 2.5.13 Name the printer HPLJ4000 OR other appropriate name and "Next" arrow
 - 2.5.14 Select "Not Shared" and "Next" arrow

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- 2.5.15 Select "Yes" to print a test page and "Finish" when completed
- 2.5.16 Select the newly installed printer as the "Default"
- 2.5.17 **IF** printer prints test page,
THEN retry printing per Attachment C, Step 2.2
- 2.5.18 **IF** printer still does not print,
THEN initiate a call for computer support.
- 2.6 Return to EPIP 1.3, Step 5.1.20.

EPIP 11.2

MEDICAL EMERGENCY



*Wisconsin
Electric
Power Company*

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List pages used for Partial Performance

Controlling Work Document Numbers

**NAMES AND
TELEPHONE NUMBERS
DELETED**

MEDICAL EMERGENCY

TABLE OF CONTENTS

SECTION	TITLE	PAGE
1.0	PURPOSE	3
2.0	PREREQUISITES	3
3.0	PRECAUTIONS AND LIMITATIONS	5
4.0	INITIAL CONDITIONS	5
5.0	PROCEDURE	6
5.1	Slight Personal Injury/Illness	6
5.2	Minor Personal Injury/Illness	6
5.3	Serious Injury/Illness	6
5.4	Individual Discovering the Injured/Ill Person(s) Response	7
5.5	Duty Shift Superintendent Response	8
5.6	Radiation Protection Supervisor, Specialist, and/or Technologist Response	8
5.6.1	Radiation Protection Actions - Onsite	8
5.6.2	Radiation Protection Actions - Offsite	9
5.7	Aurora Medical Center - Manitowoc County Personnel Response	10
5.8	Gatehouse Security Officers Response	10
5.9	General Administrative Issues	10
6.0	REFERENCES	10
7.0	BASES	11
	ATTACHMENT A DUTY SHIFT SUPERINTENDENT ACTIONS	12
	ATTACHMENT B RADIATION PROTECTION ACTIONS - ONSITE	13
	ATTACHMENT C RADIATION PROTECTION ACTIONS - OFFSITE	15

MEDICAL EMERGENCY

1.0 PURPOSE

This procedure is to provide Point Beach Nuclear Plant personnel with guidance for the immediate care of an injured/ill person(s) requiring onsite or offsite medical assistance. Both contaminated and non-contaminated events are considered.

2.0 PREREQUISITES

2.1 Responsibilities

- 2.1.1 The Duty Shift Superintendent (DSS) is responsible for the overall command and control of the event (OSC Coordinator or Reentry Team Coordinator if the OSC is activated).
- 2.1.2 Radiation Protection personnel are responsible for providing radiation and contamination controls at the scene, during transport to the hospital, and at the hospital.
- 2.1.3 The individual discovering the medical emergency is responsible for notifying the Control Room, providing treatment if qualified, and remaining at the scene to assist.
- 2.1.4 Personnel trained in first aid and CPR shall be immediate responders to the scene and provide treatment as appropriate.
- 2.1.5 The PBNP nurse is responsible for determining the equipment for the first aid room, maintaining the supply inventory, and responding to the event if onsite.
- 2.1.6 The DSS, Industrial Health & Safety Manager, and injured/ill person(s) supervisor, group manager, or contractor supervisor are responsible for ensuring the completion of NP 1.9.2, Accident And Personal Injury Reporting; OSHA Form 200 Requirements; Industrial Safety.

MEDICAL EMERGENCY

2.2 Equipment

2.2.1 On-Site First Aid Provisions (EPMP 1.3)

- a. The plant is provided with emergency showers for use with a severely contaminated but less severely injured/ill person(s).

NOTE: IF, for emergency reasons, it is necessary to transfer first aid supplies to the Radiation Control Area, THEN the unused supplies will be retained by Radiation Protection for release to the clean side.

- b. North and South Gatehouse - First aid kit (both) and one long board stretcher (Southgate).
- c. Turbine Building
- Control Room - First aid kit, burn kit, and trauma kit.
 - South of Control Room - Stretcher, first aid kit, and burn kit.
 - El. 8', Unit 1 Truck Access - Stretcher, first aid kit, and burn kit.
- d. Switchyard - First aid kit and burn kit.
- e. Facades, Unit 1 and Unit 2 - Stretcher, first aid kit, and burn kit; located on El. 66' and 26' outside each containment's personnel hatch.
- f. Site Boundary Control Center - First aid kits and burn kits.
- g. RCA Checkpoint - First aid kits, burn kit, trauma kit, and stretcher.
- h. Technical Support Center - First aid kit, burn kit, trauma kits, and stretcher.
- i. Sewage Treatment Plant - First aid kit.
- j. RCA Maintenance Shop - First aid kit and trauma kit.
- k. Emergency Plan Vehicles - First Aid Kit (one per vehicle).

2.2.2 An onsite first aid room is located in the extension building on the first level.

2.2.3 Radiation Protection supplies and survey instrumentation.

MEDICAL EMERGENCY

- 2.2.4 Portable FM Radios.
- 2.2.5 A fully equipped, controlled access emergency room will be used at Aurora Medical Center - Manitowoc County. (Reference EPMP-1.1b)
- 2.2.6 Letters of agreement are in existence with ambulance services, Aurora Medical Center - Manitowoc County, and trained physicians for treating contaminated, injured person(s).

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Employees rendering medical assistance for serious injuries shall be first aid and/or CPR qualified.
- 3.2 To eliminate or minimize occupational exposure to blood and other potentially infectious body fluids, personal protective equipment shall be used.
- 3.3 **IF** the possibility exists that treatment and transportation of a patient from PBNP may be complicated by radioactive contamination,
THEN a fully equipped, controlled access emergency room shall be used at Aurora Medical Center - Manitowoc County.
- 3.4 **IF** in doubt concerning the severity of an injury or illness,
THEN seek the higher level of medical attention.
- 3.5 Do **NOT** move the injured/ill person(s) unless in an extremely high radiation area (exposures >100 rem may result in radiation sickness) **OR** if failure to move the person may result in a more serious injury.

4.0 INITIAL CONDITIONS

An injured/ill person(s) needing medical assistance has been discovered at Point Beach Nuclear Plant, includes both protected and exclusion areas.

MEDICAL EMERGENCY

5.0 PROCEDURE

5.1 Slight Personal Injury/Illness

Not serious, but requiring **onsite medical attention** (i.e., Band-aid, small cuts where bleeding has stopped, splinters, bruises).

5.1.1 Report the injury to your supervisor.

5.1.2 Seek and receive appropriate first aid.

5.1.3 Ensure proper reporting is completed per Step 5.9.

5.2 Minor Personal Injury/Illness

Not serious but requiring **offsite professional medical attention** (i.e., larger cuts possibly requiring stitches but bleeding stopped, sprains, strains).

5.2.1 Report the injury to your supervisor.

5.2.2 **IF** contamination is not involved and it is between 0800 to 1700 Monday through Friday,
THEN after appropriate first aid, the injured/ill will be transported, by a supervisor from the injured/ill person's group, or a person designated by the DSS, to a local physician's office, or hospital, for treatment.

5.2.3 **IF** contamination is involved,
OR it is outside normal working hours,
THEN the injured/ill person(s) will be treated and transported to the Aurora Medical Center - Manitowoc County per Step 5.4.

5.2.4 Ensure proper reporting is completed per Step 5.9.

5.3 Serious Injury/Illness

Requiring **offsite emergency medical transportation** per Step 5.4 (i.e., trauma, heart attacks, heat stroke, unconsciousness, broken bones). The DSS shall ensure immediate care is provided and an ambulance is obtained for transport, radiological monitoring and control is implemented, and Security and Aurora Medical Center - Manitowoc County are apprised of the event.

MEDICAL EMERGENCY

5.4 Individual Discovering the Injured/Ill Person(s) Response

- 5.4.1 Immediately notify the Control Room at ext. 2911 and provide the following information:
- Nature and extent of the injury or illness
 - Specific location of person(s)
 - What is needed (i.e., ambulance, first aid supplies, CPR-qualified person, radiation protection personnel, etc.)
 - Name of the person(s)
 - Other emergency conditions present (i.e., fire, steam, etc.)
- 5.4.2 Perform necessary first aid to your level of training.

CAUTION

DO NOT MOVE THE INJURED/ILL PERSON(S), UNLESS:

- a. **The injured/ill person(s) is in an extremely high radiation field. (Be aware that exposures of 100-200 rem may result in radiation sickness and exposures in excess of ~300 rem may involve the risk of fatality to 50% of those exposed if medical treatment is not provided.) (Reference Step 6.10)**

OR

- b. **Failure to move the injured/ill person(s) will result in even more serious injury.**

- 5.4.3 Remain with the individual and keep them calm, if conditions permit.
- 5.4.4 Brief more qualified personnel on the person(s) condition and actions taken upon their arrival.

MEDICAL EMERGENCY

5.5 Duty Shift Superintendent Response

Complete Attachment A, Duty Shift Superintendent Actions, to ensure:

- 5.5.1 Injured/ill person(s) is(are) receiving medical treatment.
- 5.5.2 A scene leader (with radio) reports to the area for command and control of the emergency.
- 5.5.3 Radiation Protection personnel are assigned to the scene if radiological concerns are present.
- 5.5.4 Onsite personnel and outside agencies that will provide support to the emergency are contacted.
- 5.5.5 The person(s) family and supervisor are aware of the emergency.
- 5.5.6 The need for a four-hour report to the NRC has been assessed.
- 5.5.7 Documentation and follow-up are completed per Step 5.9.

5.6 Radiation Protection Supervisor, Specialist, and/or Technologist Response

- 5.6.1 If requested to report to the scene for radiological monitoring, complete Attachment B, Radiation Protection Actions - Onsite, to ensure:

NOTE: The medical care of the person(s) always takes priority over other actions (e.g., radiation protection, contamination control, area cleanup, etc.).

- a. Report to the scene with radiation monitoring instruments suitable for direct radiation readings of area and person(s).
- b. Administer first aid if qualified and not already in progress.
- c. Determine the magnitude of the radiological hazard (if any) and if the person(s) is contaminated.
 - **IF** extreme radiation exposure is being received, (>100 rem may result in radiation sickness),
THEN recommend that the person(s) be moved.
 - **IF** the injured/ill person(s) is receiving significant radiation exposure (i.e., may exceed administrative limits) and cannot be moved from the field,
THEN consider use of shielding to reduce exposure.

MEDICAL EMERGENCY

- d. Report the following information to the Control Room (or Reentry Team Coordinator in OSC, if activated):
 - Injured/ill person(s) is(is not) contaminated.
 - **IF** contaminated,
THEN provide the affected areas and highest appropriate value in cpm or mR/hr.
- e. Evaluate need to issue protective clothing and dosimetry to emergency medical technicians, based upon severity of medical injuries and scene conditions.
- f. Assist in radiological control aspects of handling the person(s) until they are safely within the ambulance.
 - Deconning if actions do not escalate medical condition.
 - Wrapping to prevent spread of contamination and escalation of medical condition.
- g. Route several Radiation Protection personnel to the Aurora Medical Center - Manitowoc County to assist with the radiological setup prior to the arrival of the person(s). On backshift and weekends, contact RP Duty and Call Supervisor.
- h. Accompany the injured/ill person(s) in the ambulance, providing contamination control for the person(s) and ambulance personnel, **IF** permitted by the Emergency Medical Technicians.

5.6.2 Complete Attachment C, Radiation Protection Actions - Offsite, to ensure:

- a. Assist in the radiological setup of the hospital and personnel.
- b. Assist in the ongoing radiological monitoring and contamination control.

NOTE: As soon as possible, assure that the hospital emergency department hallways, ambulance garage, ambulance and equipment, plus facilities and equipment, have been decontaminated and released. The various areas shall be done separately from the others to expedite public access.

- c. Perform clean release surveys at the hospital and for the ambulance.

MEDICAL EMERGENCY

5.7 Aurora Medical Center - Manitowoc County Personnel Response

5.7.1 **IF** the injured/ill person(s) is not contaminated,
THEN he/she will be handled by standard Aurora Medical Center -
Manitowoc County procedures.

5.7.2 **IF** the injured/ill person(s) is contaminated by radioactive material,
THEN the Aurora Medical Center - Manitowoc County will implement their
"Condition Alert-Nuclear" procedure to treat him/her.

5.8 Gatehouse Security Officers Response

Upon being notified that medical response personnel (EMTs/Ambulance) will be arriving, the gatehouse security officers will:

5.8.1 Determine the desired location of the ambulance.

5.8.2 Escort the ambulance to desired location and EMTs to scene of accident.

5.8.3 Expedite ingress/egress of the ambulance and crew.

5.9 General Administrative Issues

In case of injury, the DSS, Industrial Health & Safety Manager, injured/ill person(s) supervisor, group manager, or contractor supervisor shall perform administrative responsibilities in accordance with NP 1.9.2, Accident and Personal Injury Reporting; OSHA Form 200 Requirements; Industrial Safety, and NP 1.10.2, Accident, Injury and Illness Reporting.

6.0 REFERENCES

6.1 DCS 2.1.1, Requirements and Guidance for Immediate Notification to NRC/EPA of "Significant Events" at PBNP

6.2 EP 6.0, Emergency Measures

6.3 EP 7.0, Emergency Facilities and Equipment

6.4 EPMP 1.3, Routine Inventory of TSC, EOF, AEOF, JPIC and OSC Emergency Preparedness Supplies

6.5 EPMP-1.1b, Radiation Protection - Emergency Preparedness Quarterly Checklist

6.6 HPIP 3.51, Contamination Surveys

MEDICAL EMERGENCY

- 6.7 NP 1.9.2, Accident and Personal Injury Reporting; OSHA Form 200 Requirements; Industrial Safety
- 6.8 NP 1.10.2, Accident, Injury and Illness Reporting
- 6.9 NP 4.2.25, Release of Material, Equipment and Personal Items from Radiologically Controlled Areas
- 6.10 Regulatory Guide 8.29, Instruction Concerning Risks From Occupational Exposure, February 1996, Revision 1

7.0 BASES

- B-1 10 CFR 50.47(b), Emergency Plans
- B-2 10 CFR 50.47, Appendix E.IV, Content of Emergency Plans

MEDICAL EMERGENCY

ATTACHMENT A
DUTY SHIFT SUPERINTENDENT ACTIONS

Initials/Time

- 1.0 Ensure injured/ill person(s) is(are) receiving first aid by two trained responders. /
- 2.0 Assign one person (with portable radio) to report as a scene leader for command and control of all personnel responding, and to keep you apprised of the event (recommend an SRO). /
- NOTE: If the injured/ill person(s) is in a radiation or contaminated area where contamination cannot be evaluated and cannot be moved, then assume he/she is contaminated.**
- 3.0 Call the Manitowoc County Sheriff's Department to request an ambulance, if needed.
Provide the following information:
- 3.1 Number of injured/ill persons: _____
- 3.2 Nature of the injuries: _____
- 3.3 Radiological status (circle one) Clean - Contaminated - Potentially contaminated /
- 4.0 Contact PBNP Nurse, if onsite, to report to the scene. Provide information of the event. /
- 5.0 **IF** radiological concerns are present,
THEN assign Radiation Protection personnel to implement Attachment B of this procedure and report to the scene. /
- 6.0 Notify security if an ambulance has been requested. Provide radiological status of the injured/ill person. Advise them to escort the EMTs to the scene upon arrival. /
- 7.0 Call the Aurora Medical Center - Manitowoc County and provide the following information:
- 7.1 Number of injured/ill person(s): _____
- 7.2 Condition of injured/ill person(s): _____
- 7.3 Radiological status (circle one) Clean - Contaminated - Potentially contaminated /
- 8.0 Notify the Plant Manager (TSC Manager if the TSC has been activated), and advise that injured/ill person's family and supervisor be notified of the injury. /
- 9.0 **IF** the injured person is contaminated,
THEN notify the Manitowoc County Sheriff's Department and request the ambulance remain at the hospital until Radiation Protection personnel release the vehicle and its equipment. /
- 10.0 Recontact the Aurora Medical Center - Manitowoc County with the estimated time of arrival, further medical information, and details of radiological concerns. /
- 11.0 Assess the need for a four-hour event report per DCS 2.1.1, Requirements and Guidance for Immediate Notification to NRC/EPA of "Significant Events." /
- 12.0 Ensure Step 5.9 of the procedure for completion of General Administrative Issues is assigned as appropriate. /

ROUTE COMPLETED FORM TO EMERGENCY PREPAREDNESS

MEDICAL EMERGENCY

ATTACHMENT B
RADIATION PROTECTION ACTIONS - ONSITE
Page 1 of 2

NOTE: The medical care of the person(s) always takes priority over other actions (e.g., radiation protection, contamination control, area cleanup, etc.)

		Initials/Time
1.0	Immediately report to the scene upon being contacted by the Control Room with radiation monitoring instruments suitable for direct radiation readings of area and person(s).	<u> / </u>
2.0	Administer medical treatment if qualified and first aid is not already in progress.	<u> / </u>
3.0	Survey the injured/ill person(s) and area for radiation and contamination, documenting the highest reading on the following page.	<u> / </u>
4.0	Contact the Control Room with the results of your surveys and affected areas of injured/ill person(s) and scene.	<u> / </u>
5.0	<u>IF</u> extreme radiation exposure is being received, (>100 rem may result in radiation sickness), <u>OR</u> failure to move the person(s) may result in a more serious injury, <u>THEN</u> recommend that the person(s) be moved.	<u> / </u>
6.0	<u>IF</u> the injured/ill person(s) is receiving significant radiation exposure (i.e., may exceed administrative limits) and cannot be moved from field, <u>THEN</u> consider use of shielding to reduce exposure.	<u> / </u>
7.0	Evaluate need to issue dosimetry and protective clothing to offsite medical response personnel, based on severity of injury and scene conditions.	<u> / </u>
8.0	Assist in radiological control aspects of handling the person(s) until they are safely within the ambulance.	
8.1	Deconning if actions do not escalate medical condition.	<u> / </u>
8.2	Wrapping with sheet, blanket, or plastic to prevent spread of contamination if medical condition prevents deconning.	<u> / </u>
9.0	Route several Radiation Protection personnel to the Aurora Medical Center - Manitowoc County to implement Attachment C, assisting with the radiological setup prior to the arrival of the injured/ill person(s). On backshift and weekends, contact on call RP Duty and Call Supervisor.	<u> / </u>
10.0	Accompany the injured/ill person(s) in the ambulance, providing contamination control for the person(s) and ambulance personnel, <u>IF</u> permitted by the Emergency Medical Technicians.	<u> / </u>

MEDICAL EMERGENCY

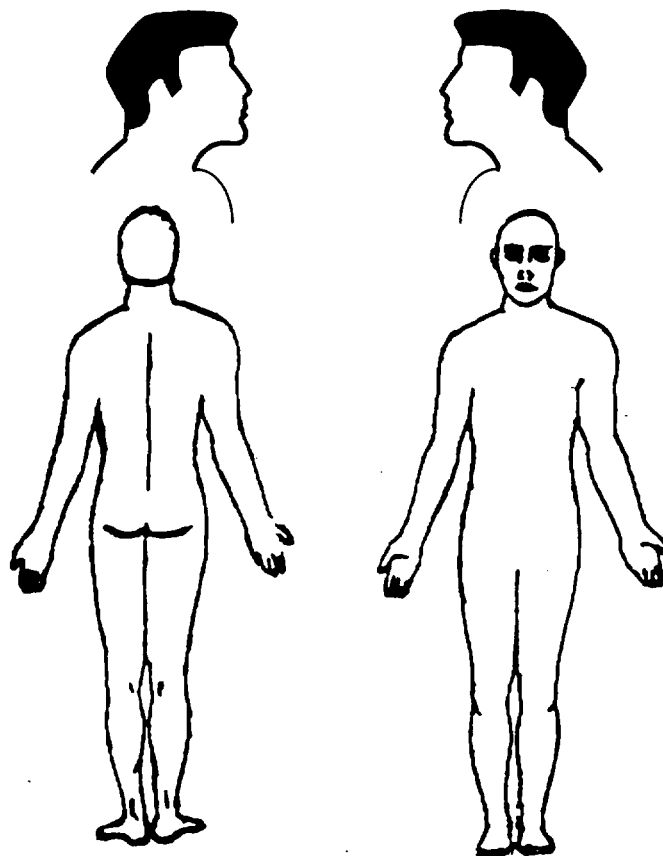
ATTACHMENT B
RADIATION PROTECTION ACTIONS - ONSITE
Page 2 of 2

NOTE: The medical care of the person(s) always takes priority over other actions (e.g., radiation protection, contamination control, area cleanup, etc.)

11.0 Injured/Ill Persons Name: _____ Date/Time ____/____/____
Employer: _____ Work Group: _____

12.0 Results of radiological survey of scene in cpm or mR/hr: _____
Comments: _____

13.0 Indicate wounds and/or contaminated areas in cpm or mR/hr:
Comments: _____



14.0 Potential for internal contamination? ☐ Yes ☐ No
Comments: _____

15.0 Describe actions taken to minimize the spread of contamination (i.e., decon, wrap, etc.):

ROUTE COMPLETED FORM TO EMERGENCY PREPAREDNESS

MEDICAL EMERGENCY

ATTACHMENT C
RADIATION PROTECTION ACTIONS - OFFSITE

Page 1 of 4

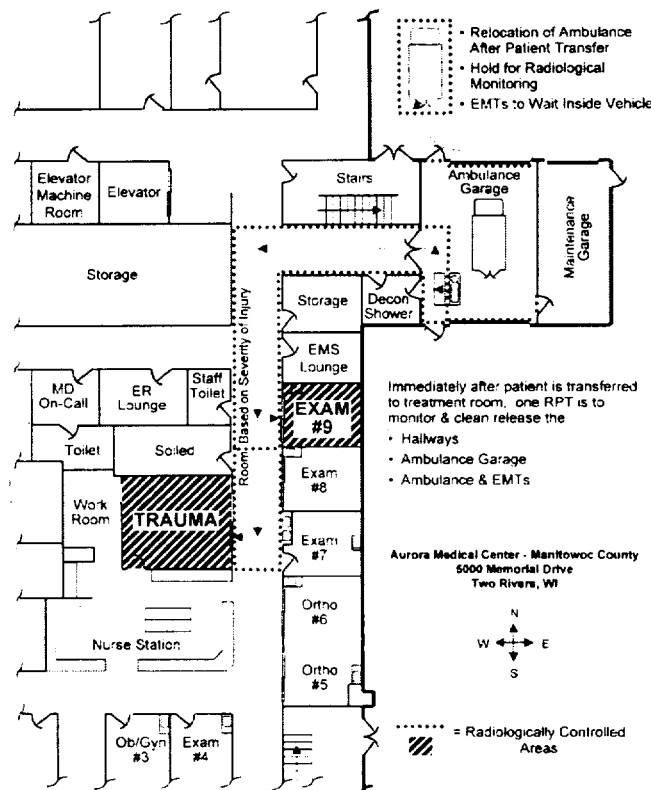
NOTE 1: The attending physician's orders must be followed and **ONLY** the physician is in direct charge of the situation. The medical care of the person(s) always takes priority over other actions (e.g., radiation protection, contamination control, area cleanup, etc.).

NOTE 2: As soon as possible, assure that the hospital emergency department hallways, ambulance garage, ambulance and equipment, plus facilities and equipment have been decontaminated and released. The various areas shall be done separately from the others to expedite public access.

Initials/Time

1.0 Proceed to the Aurora Medical Center - Manitowoc County. If possible, arrive before the ambulance.

2.0 Upon arrival, identify yourself to hospital personnel and provide setup assistance with contamination boundaries, postings and controls for the ambulance garage, emergency department hallways and emergency room.



NOTE: If ambulance garage is unavailable, alternate route is to park in the "ambulance relocation area" northwest of the ambulance garage. A radiologically controlled area should be set up there for patient transfer and entrance via the north door of the ambulance garage.

MEDICAL EMERGENCY

ATTACHMENT C
RADIATION PROTECTION ACTIONS - OFFSITE
Page 2 of 4

NOTE: PBNP personnel entering the emergency room should dress in the same protective equipment being worn by the hospital staff.

	Initials/Time
3.0 Issue dosimetry for hospital and plant personnel and ensure they have appropriate protective clothing.	<u>/</u>
4.0 Provide a radiological status of injured person to hospital personnel.	<u>/</u>
5.0 Assist in maintaining radiological and contamination controls for:	
5.1 Hospital personnel and equipment leaving the restricted area.	<u>/</u>
5.2 Injured/ill person(s) during treatment.	<u>/</u>
6.0 Upon transfer of the injured contaminated person into the emergency room, monitor, survey, and clean release the following areas per Step 8.0.	
6.1 Emergency Department hallways	<u>/</u>
6.2 Ambulance garage	<u>/</u>
6.3 Ambulance and ambulance personnel	<u>/</u>
6.4 Ambulance Relocation Area, if implemented.	<u>/</u>
7.0 Upon completion of medical treatment and transfer of the injured/ill person into another area, monitor, survey, and clean release the following areas per Step 8.0.	
7.1 Medical personnel and equipment	<u>/</u>
7.2 Emergency Room/Emergency department hallways	<u>/</u>
7.3 Other locations and equipment set up as radiological restricted areas during the treatment of the person(s)	<u>/</u>
8.0 Survey and Clean Release Guidelines	
8.1 Masslinn (treated cloth wipes)	
8.1.1 For large flat surface areas, the affected area may be wiped with masslinn. All areas where there is the potential for contamination must be wiped.	
8.1.2 The masslinn should be laid flat with the dirty side up for the survey.	

ATTACHMENT C
RADIATION PROTECTION ACTIONS - OFFSITE

Page 3 of 4

8.1.3 Count the masslinn using an open-window, pancake type probe sensitive to beta and gamma radiation. The measurement shall be made at a distance of approximately 1/2 inch and at a scan rate of less than 4 inches per second.

8.1.4 The area may be released as clean if the count rate from the masslinn is determined to be free from detectable radioactive contamination.

8.1.5 Fixed contamination levels must be \leq background (none detectable). (Reference NP 4.2.25)

8.2 Direct Frisk

8.2.1 Any surface area may be surveyed directly with a hand-held frisker which is sensitive to beta and gamma radiation.

8.2.2 The area may be released as clean if the count rate determined to be free from detectable radioactive contamination.

8.2.3 Fixed contamination levels must be \leq background (none detectable). (Reference NP 4.2.25)

8.3 Smear Survey

8.3.1 Any surface area may be surveyed indirectly using smears and a counting instrument.

8.3.2 The standard method described in HPIP 3.51, Contamination Surveys, for obtaining, documenting, and counting smears will be followed.

MEDICAL EMERGENCY

ATTACHMENT C
RADIATION PROTECTION ACTIONS - OFFSITE
Page 4 of 4

NOTE: Hospital staff will work with plant personnel to eliminate the biological hazard of the radioactive waste generated prior to disposal of the material as radioactive waste.

	Initials/Time
9.0 Collect any protective clothing and dosimetry that may have been issued to the ambulance EMTs and complete appropriate paperwork.	<u> / </u>
10.0 Bag and properly label all disposable and non-disposable contaminated items.	<u> / </u>
11.0 Notify the Rad Waste Supervisor of waste and quantity to ensure the immediate transport and proper disposal of contaminated materials.	<u> / </u>
12.0 Identify hospital and ambulance equipment which may require replacement below.	<u> / </u>
12.1 _____	
12.2 _____	
12.3 _____	
12.4 _____	
12.5 _____	
12.6 _____	
12.7 _____	
13.0 Comments _____	

_____	<u> / </u>

ROUTE COMPLETED FORM TO EMERGENCY PREPAREDNESS