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

Enclosed are copies of revised procedures to the Point Beach Nuclear Plant Emergency Plan Implementing Procedure Revisions. The revised procedures dated August 29, 2003 should be filed in your copy of the manual.

Sincerely,

A.J. Cayia

A.J. Cayia
Site Vice President

FAF/kmd

Enclosures

cc: NRC Resident Inspector (w/o/e)
Incident Response Center, Region III

A045

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(T - Temporary Change)

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

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(T - Temporary Change)

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

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EPIP-1.3a	Emergency Event - Immediate Actions - Duty Shift Superintendent (Insert behind EPIP 1.3) (Incorporated into EPIP 1.1)	5	CANCELED	11/30/99
EPIP-1.3b	Emergency Event - Immediate Actions - Shift Technical Advisor (Insert behind EPIP 1.3) (Incorporated into EPIP 1.1)	4	CANCELED	11/30/99
EPIP-1.3c	Emergency Event - Immediate Actions - Plant Operations Manager (Incorporated into EPIP-1.3a, PIM EOF 4.1, PIM EOF 4.5 and PIM TSC 2.7)	5	CANCELED	10/28/98
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EPIP-1.3e	Emergency Event - Immediate Actions Emergency Support Manager (Incorporated into PIM EOF 4.1)	4	CANCELED	10/28/98
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EPIP-4.1a	Technical Support Center Activation Checklist (Incorporated into PIM TSC 2.1, PIM TSC 2.7, and PIM TSC 2.5)	3	CANCELED	10/28/98
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EPIP-5.1a	Emergency Plan Dose Authorization (Insert behind EPIP 5.1) (Incorporated into EPIP 5.1)	3	CANCELED	11/30/99
EPIP-5.2a	Dose Accountability for Exposures to Airborne Radioiodine (Insert behind EPIP 5.2) (Incorporated into EPIP 5.2)	1	CANCELED	11/30/99
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EPIP-6.6d	Accountability Summary - Front Office	2	CANCELED	12/29/97
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EPIP-6.6f	Accountability Summary - NSB Cafeteria	2	CANCELED	12/29/97
EPIP-6.6g	Accountability Summary - Control Room	1	CANCELED	12/29/97
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EPIP-6.6j	Accountability Summary - CAS	0	CANCELED	12/29/97
EPIP-6.7a	Event Involvement Summary (Insert behind EPIP 6.7) (Incorporated into EPIP 6.1)	1	CANCELED	11/30/99
EPIP-6.7b	Emergency Event Information Sheet (Insert behind EPIP 6.7) (Incorporated into EPIP 6.1)	2	CANCELED	11/30/99
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EPIP-7.1b	Emergency Plan Equipment Requiring Transport from the Health Physics Station (Incorporated into PIM OSC 3.2)	1	CANCELED	10/28/98
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EPIP-7.2.1b	Offsite Mobile Survey Team Equipment Inventory and Functional Test Checklist (Incorporated into PIM OSRPF 5.2)	3	CANCELED	10/28/98
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EPIP-7.2.1e	Dosimetry Device Issue Record and Exposure Log (Insert behind EPIP 7.2.1) (Incorporated into PIM OSC 3.2 and PIM OSRPF 5.3)	0	CANCELED	11/30/99
EPIP-7.2.1f	Meteorological Data (Pad Format, copy of form should be in your manual) (Incorporated into PIM TSC 2.8 and PIM EOF 4.6)	1	CANCELED	11/30/99
EPIP-7.3.1a	Offsite Airborne Radiation Survey Sample Analysis (Insert behind EPIP 7.3.1) (Incorporated into EPIP 7.3.1)	1	CANCELED	11/30/99
EPIP-7.3.1b	Ground Deposition (Insert behind EPIP 7.3.1) (Incorporated into EPIP 7.3.1)	1	CANCELED	11/30/99
EPIP-7.3.1c	Dose Factor Calculations For Specific Noble Gas Analysis Results (Insert behind EPIP 7.3.1) (Incorporated into EPIP 7.3.1)	0	CANCELED	11/30/99
EPIP-7.3.1d	Offsite Airborne Radiation Survey Sample Data (Insert behind EPIP 7.3.1) (Pad Format, copy of form should be in your manual) (Incorporated into EPIP 7.3.1)	1	CANCELED	11/30/99

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EPIP-08	Estimated Whole Body and Thyroid Projected Doses		CANCELED	03/85
EPIP-8.4.1a	Reactor Coolant Post Accident Sampling Analysis Report	3	CANCELED	06/30/98
EPIP-8.4.2a	Containment Atmosphere Post-Accident Sampling Analysis Report	0	CANCELED	12/29/97
EPIP-09	Estimated Whole Body Dose Calculation Worksheet for Specific Noble Gas Releases		CANCELED	03/85
EPIP-9.2a	Estimated Population Dose		CANCELED	12/30/93
EPIP-9.2b	Summary of Radiological Dose Evaluation Calculations (Insert behind EPIP 9.2.)		CANCELED	12/30/93
EPIP-10	Estimated Ground Deposition Calculation Worksheet for Particulate Radionuclide Releases		CANCELED	03/85
EPIP-10.1a	Reentry Team Preparation and Deployment (Insert behind EPIP 10.1) (Incorporated into EPIP 10.1)	5	CANCELED	11/30/99
EPIP-10.1b	Reentry Team Debrief (Insert behind EPIP 10.1) (Incorporated into EPIP 10.1)	3	CANCELED	11/30/99
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EPIP-11.1b	Search and Rescue/Emergency Reentry Team Dispatch Checklist		CANCELED	03/90
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EPIP-11.3b	Health Physics Response Checklist Ambulance Assistance	1	CANCELED	01/24/97
EPIP-11.3c	Radiation Protection Response Checklist Emergency Room (ER) (Insert behind EPIP 11.3) (Incorporated into EPIP 11.2)	6	CANCELED	11/30/99
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EPIP-12.2a	Recovery Plan Action Items (Insert behind EPIP 12.2) (Incorporated into EPIP 12.2)	1	CANCELED	11/30/99

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EPIP-13a	PBNP Status Update - Radiological (Insert behind EPIP-13, behind EPIP 2.1) (Incorporated into EPIP 2.1)	2	CANCELED	11/30/99
EPIP-14	Event Notification Worksheet (Insert behind EPIP 2.2) (Incorporated into EPIP 2.1)	1	CANCELED	11/30/99
EPIP-22	Emergency Response Organization (ERO) Call List (Insert behind Call List Tab) (Incorporated into ETD 01)	36	CANCELED	11/30/99
EPIP-23	Offsite Agency Call List (Insert behind Call List Tab) (Incorporated into ETD 02)	33	CANCELED	11/30/99
EPIP-24	Emergency Response Facilities Telephone List (Insert behind Call List Tab) (Incorporated into ETD 03)	21	CANCELED	11/30/99
EPIP-25	W.E. Corporate Personnel Call List (Insert behind Call List Tab) (Incorporated into ETD 04)	32	CANCELED	11/30/99
EPIP-26	Oil and Hazardous Material Spill Call List (Insert behind Call List Tab) (Incorporated into ETD 06)	29	CANCELED	11/30/99
EPIP-27	Notification/Augmentation Guideline (Incorporated into EPIP-3.2 and EPIP-22)	1	CANCELED	10/28/98
EPIP-30	Reactor Coolant Post Accident Sampling Analysis Report		CANCELED	02/89
EPIP-31	Containment Atmosphere Post-Accident Sampling Analysis Report		CANCELED	02/89
EPIP-33	Estimate of Core Damage Worksheet		CANCELED	08/87
EPIP-34	Calculation of XE-133 Equivalent Release Rates		CANCELED	08/87
EPIP-35	Dose Calculations		CANCELED	09/85

EPIP 1.3

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

DOCUMENT TYPE:	Technical
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OWNER GROUP:	Emergency Preparedness

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Signature Date Time

List pages used for Partial Performance

Controlling Work Document Numbers

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_____ _____ _____
_____ _____ _____

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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 Shift Manager (SM) 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 SM 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 based upon radiological conditions.

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)

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Complete this procedure regardless of changing plant conditions.

3.2 PARs are made to the Sate and Counties by the Shift Manager or the Emergency Director, depending on the status of emergency facility activation. The Dose/PAR Coordinator (or the Rad Chem Coordinator if the EOF is not activated), performs dose projections and monitors offsite radiological conditions, develops the associated PAR and provides the PAR and basis to the Emergency Director.

3.3 PARs are developed from current rather than forecasted weather conditions. PARs are revised due to actual weather condition changes (e.g. wind shift occurs or atmospheric stability class changes) only when a revised dose projection or offsite radiological condition results in a change in PAR.

3.4 If the current wind direction is on or within 2 degrees of a sector line, then the two affected sectors are designated as the downwind sector. Downwind sector selection for the PAR shall include the adjacent sectors to the downwind sector(s). This will always result in either a 3 or 4 sector keyhole.

3.5 Use a realistic estimate of release duration in these calculations whenever possible.
IF the duration of the radiological release can **NOT** be determined from the current plant conditions,
THEN, assume a duration of four hours.

3.6 **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):

3.6.1 National Weather Service in Green Bay

3.6.2 Kewaunee Nuclear Power Plant

3.6.3 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 Protective Action Recommendations (PARs)

NOTE: PARs are made to the Sate and Counties by the Shift Manager or the Emergency Director, depending on the status of emergency facility activation. The Dose/PAR Coordinator (or the Rad Chem Coordinator if the EOF is not activated), performs dose projections and monitors offsite radiological conditions, develops the associated PAR and provides the PAR and basis to the Emergency Director.

NOTE: PARs are developed from current rather than forecasted weather conditions. PARs are revised due to actual weather condition changes (e.g. wind shift occurs or atmospheric stability class changes) only when a revised dose projection or offsite radiological condition results in a change in PAR.

NOTE: If the current wind direction is on or within 2 degrees of a sector line, then the two affected sectors are designated as the downwind sector. Downwind sector selection for the PAR shall include the adjacent sectors to the downwind sector(s). This will always result in either a 3 or 4 sector keyhole.

5.1.1 **IF** the event is a General Emergency
AND ALL the following criteria are met,
THEN implement expanded PARS of evacuation for 0-5 miles all sectors and 5-10 miles downwind sectors. [EOF] (Ref Step 6.15)

a. Substantial core damage in progress or projected (>20%) (> 30,000 R/hr in containment high radiation monitors)

b. Large fission product in inventory in containment (more than GAP) (LOSS criteria for RCS barrier in EPIP 1.2, Attachment C, exceeded)

c. Imminent projected containment failure or release underway (LOSS criteria for containment barrier in EPIP 1.2, Attachment C, exceeded)

5.1.2 **IF** a General Emergency is declared **AND** there is indication of a lake breeze or low wind speed (<3mph),
THEN the PAR for the condition is evacuation 0-5 miles (all sectors).

5.1.3 **IF** a General Emergency is declared **AND** the conditions stated in step 5.1.1 and 5.1.2 DO NOT exist,
THEN the required PAR is evacuation 0-2 miles (all sectors) and 2-5 miles (3 or 4 downwind sectors centered on the average wind direction).

NOTE: Emergency Classifications and PARs shall be made to the State and Counties within 15 minutes of the emergency classification being declared or identification of a change in the required PAR.

5.1.4 PARs shall be documented on EPIP Form 2.1 and sent to the State and Counties.

5.1.5 There are no PARs required for Site Emergency, Alert, or Unusual Event emergency classifications.

5.1.6 **IF** a release is occurring or is imminent,
THEN radiological release evaluation and dose projection shall be completed using steps 5.2-5.5 as applicable to determine or revise the emergency classification and/or PAR.

a. WEDAP (section 5.2)

b. RMS-SS (section 5.3)

c. Offsite Field Measurements (section 5.4)

d. Manual Calculations (section 5.5)

NOTE: Review section 3.0 prior to revising the PAR.

5.2 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".**

5.2.1 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.

5.2.2 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.

5.2.3 Launch WEDAP by selecting "Business Applications – WEDAP" or the "WEDAP icon".

5.2.4 Select "Start" when prompted at WEDAP introduction screen.

5.2.5 Enter a "Title" for this dose assessment case to provide retrievability if the case is saved.

5.2.6 Click on "Data" on the toolbar and select the option "Case Basis".

5.2.7 Click on the appropriate "Accident Type" for the event.

5.2.8 Update **all** the data fields in the "Source Term" section.

5.2.9 Update **all** the data fields in the "Release Path" section.

5.2.10 Click "OK" to return to the summary page.

5.2.11 Verify details in the "Accident Data" section are based upon the data selected in Steps 5.2.5 - 5.2.9, returning to "Data" and "Case Basis" to make corrections if necessary.

5.2.12 Update "Reactor Shutdown Time" data field with the correct data if applicable.

5.2.13 Update "Release Start" by entering the time the release to environment began.

5.2.14 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.

5.2.15 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

5.2.16 Verify the data on the WEDAP main screen and make corrections if appropriate.

5.2.17 Click on the "Calculate" icon to perform the final dose assessment calculations, which automatically updates the dose assessment data fields.

5.2.18 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

5.2.19 Compare the results of 5.2.18 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 5.6,
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 reclick on "File" and "Restart WEDAP" to start a new scenario with new cases.

5.2.20 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.

5.2.21 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 5.2.5 - 5.2.19

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.

  (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 5.2.17, Step 5.2.18, and Step 5.2.20,
THEN click on the "Delete Case" icon, **AND** repeat Step 5.2.21.

e. **IF** the case was built on the actual events in progress,
THEN repeat Steps 5.2.17 - 5.2.19

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

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

5.3.1 **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.

5.3.2 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.

5.3.3 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".

- 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 (µCi/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	_____

5.3.4 **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.

5.3.5 Record the highest in-range (**NOT** failed) alarming RMS channel readings (µCi/cc) for each release path on Table 2 and calculate the release rate.

TABLE 2
RELEASE RATE CALCULATIONS

NOTE: Conversion factors assume nominal flow rates.

RMS #	LOCATION	READING (µCi/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)	_____	x 6	= _____
	(2 fans)	_____	x 12	= _____
2RE-212 2RE-305 2RE-307 2RE-309	U2 Containment Purge (0 or 1 fans)	_____	x 6	= _____
	(2 fans)	_____	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	_____	x 1.5	= _____
	1 Safety	_____	x 4.0	= _____
	2 Safeties	_____	x 8.0	= _____
	3 Safeties	_____	x 12.0	= _____
	4 Safeties	_____	x 16.0	= _____
	Release Rate Total (Ci/sec)			= _____

NOTE: IF desired PPCS points have poor or bad quality, THEN obtain σθ and lapse rate readings from the Control Room indications, AND THEN reference Table 4 to determine stability class.

5.3.6 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 5.3.6.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 5.3.6.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:

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

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

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

$$3280\frac{\text{rem - m}^3}{\text{Ci - hr}} \times \frac{\qquad}{\text{(Table 2 Total)}} \times \frac{\qquad}{\text{(Step 5.3.6.c)}} \times \frac{\qquad}{\text{(ERD)}} = \frac{\qquad}{\text{[PROJ. W. B. DOSE (TEDE)]}}\ \text{Rem}$$

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

NOTE: Choose LOCA accident type unknown			
ACCIDENT TYPE	PROJECTED WHOLE BODY DOSE (TEDE) (Rem) (From Step 5.3.8)	CONVERSION FACTOR	PROJECTED THYROID DOSE (CDE) (Rem)
LOCA	_____	x 15 =	_____
Gap Activity	_____	x 3 =	_____
Fuel Handling	_____	x 20 =	_____
SG Tube Rupture	_____	x 12 =	_____

5.3.10 **IF** the event meets the following criteria for a GENERAL EMERGENCY, **THEN** go to Step 5.3.14 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.

5.3.11 **IF** the event meets the following criteria for a SITE EMERGENCY, **THEN** go to Step 5.3.15.

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.

5.3.12 **IF** the event meets the following criteria for an ALERT, **THEN** go to Step 5.3.15.

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)].

5.3.13 **IF** the event meets the following criteria for an UNUSUAL EVENT, **THEN** go to Step 5.3.15.

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

5.3.14 Determine Protective Action Recommendations

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

a. To determine protective action recommendations compare values from Step 5.3.9 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.

5.3.15 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

5.4 Offsite Field Measurements

5.4.1 Check if Plume Impacts Terrestrial Areas

a. Wind Direction > 305°

OR

b. Wind Direction < 210°

5.4.2 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

5.4.3 **IF** measurement from Step 5.4.2 is ≥1 R/hr,
THEN event is a GENERAL EMERGENCY.

5.4.4 **IF** a General Emergency,
THEN determine minimum Protective Action Recommendations,
AND go to Step 5.4.6.

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.

5.4.5 **IF** measurements from Step 5.4.2 is ≥0.1 R/hr,
THEN event is a SITE EMERGENCY,
AND go to Step 5.4.6.

5.4.6 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

5.5 Manual Calculations

5.5.1 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 Shift Manager 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 5.5.1.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 Shift Manager.

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).

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					
		Gap Accident[4]			Steam Generator Tube Rupture[2]	
Vent Pathway	LOCA[1]	0-12 hours	> 12 hours	FHA[1]	No condenser	Condenser
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:

Vent Pathway	Flow Rate (ft^3/min)
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

WORKSHEET 1
RELEASE RATE CALCULATIONS
Page 1 of 3

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

Monitor	Reading (µCi/cc)	Conversion Factor (cc-Ci/s-µCi)	Release Rate (Ci/s)
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	_____

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

Monitor	Meter Reading (R/hr)	Conversion Factor (Ci-h/s-rem) (Table 3)	Release Rate (Ci/s)
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)	_____	_____	_____

WORKSHEET 1
RELEASE RATE CALCULATIONS
Page 3 of 3

C. ACTUAL VERSUS CONVERSION CURVE FLOW RATE RATIO

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

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

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.

	Vent	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.

5.5.2 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.

Data	Source
• 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

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, $\Delta T/\Delta H$, $^\circ F/35$ 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

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

12. Centerline X/Q:

Site Boundary	Two Miles	Five Miles	Ten Miles	Other

Completed By:_____ **Date/Time**_____/_____

Route to Dose/PAR Coordinator upon completion.

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	$\sigma_\theta \geq 22.5°$	$\Delta T/\Delta H \leq -1.2$
Moderately unstable	B	$22.5° > \sigma_\theta \geq 17.5°$	$-1.2 < \Delta T/\Delta H \leq -1.1$
Slightly unstable	C	$17.5° > \sigma_\theta \geq 12.5°$	$-1.1 < \Delta T/\Delta H \leq -0.9$
Neutral	D	$12.5° > \sigma_\theta \geq 7.5°$	$-0.9 < \Delta T/\Delta H \leq -0.3$
Slightly stable	E	$7.5° > \sigma_\theta \geq 3.8°$	$-0.3 < \Delta T/\Delta H \leq 0.9$
Moderately stable	F	$3.8° > \sigma_\theta \geq 2.1°$	$0.9 < \Delta T/\Delta H \leq 2.5$
Extremely stable	G	$2.1° > \sigma_\theta$	$2.5 < \Delta T/\Delta H$

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

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.

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

(Units are m^{-2})

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

	Distance From the Site (miles)									
Stability Class	Site Boundary	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

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:

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

Enter the X/Q values on Worksheet 2.

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

5.5.3 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.

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:

$$Dose_i = Q \times F_i \times \frac{\chi}{Q} \times DCF_i \times ERD$$

SECTOR _____

DISTANCE _____ miles

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, rem-m^3/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.

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:

$$Dose_{i,\ whole\ body} = Q \times F_i \times \frac{\chi}{Q} \times DCF_i \times ERD$$

where:

$Dose_{i,\ whole\ body}$	=	whole body dose, rem;
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. 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	=	gross release rate, curies per second;
X/Q	=	atmospheric dispersion factor, seconds per m^3;
DCF_I	=	whole body dose conversion factor for nuclide i, rem-m^3/Ci-hr;
ERD	=	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.

5.5.4 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.

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

$$Dose_i = Q \times F_i \times \frac{\chi}{Q} \times DCF_i \times ERD$$

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/m^3;
DCF_i is the whole body dose conversion factor for the radionuclide i, $rem\text{-}m^3/Ci\text{-}hr$;
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.

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:

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

where:

$Dose_{i,\,thyroid}$	=	thyroid dose, rem;
Q	=	release rate for nuclide i, 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. 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	=	atmospheric dispersion factor, seconds per m^3;
DCF_I	=	thyroid dose conversion factor for nuclide i, rem-m^3/Ci-hr;
ERD	=	estimated duration of the release, hours.

g. Sum the calculated doses and enter it on Worksheet 4.

h. Sign and date Worksheet 4 and fax to Dose/PAR Coordinator.

5.5.5 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.

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

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

TIME _____

where: Dep_i is the deposition of radionuclide i, curies/m^2;
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/m^3;
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.

f. Calculate the ground deposition values using the equation:

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

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.

5.5.6 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.

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

Sector	Distance (miles)	Population	Dose (rem)	Population Dose (person-rem)
_____	2	_____	_____	_____
_____	5	_____	_____	_____
_____	10	_____	_____	_____
			Total Dose	_____

Population Figures
(By Sector and Distance)

Sector	Distance 0 to 2 miles	2 to 5 miles	5 to 10 miles
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.

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.

5.5.7 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.

5.5.8 **IF** a General Emergency,
THEN evaluate Attachment B for the potential need to issue expanded PARs.

5.5.9 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

TABLE 7
LOCA SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY NOT USED

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.

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.

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

TABLE 7
GAP ACTIVITY RELEASE SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY USED
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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.

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.

TABLE 7
FUEL HANDLING ACCIDENT SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY USED
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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.

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.

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.

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.

ATTACHMENT A
AFFECTED SECTORS BASED ON WIND DIRECTION

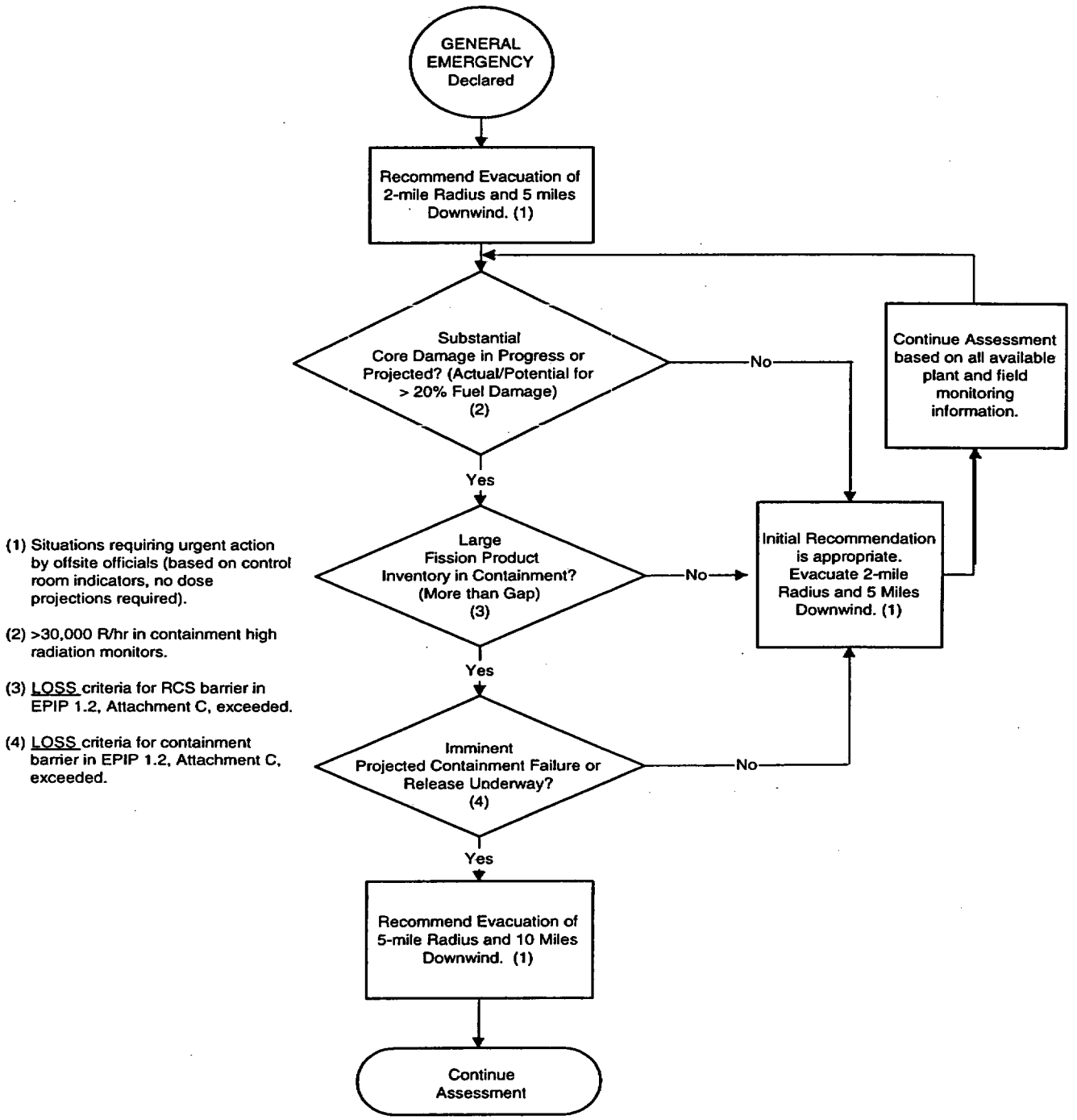
NOTE: If wind speed is less than three (3) mph or lake breeze conditions exist, then recommend protective actions for all sectors (360°) 0-5 miles. Lake breeze conditions exist if the difference between actual wind direction values for inland and near shore meteorological towers is greater than 90°.

Wind Direction* (Degrees From)	Affected Downwind Sectors
>351 - 9 (>351 - 369**)	H, J, K
>9 - 13 (>369 - 373**)	H, J, K, L
>13 - 32 (>373 - 396**)	J, K, L
>32 - 36 (>392 - 396**)	J, K, L, M
>36 - 54 (>396 - 414**)	K, L, M
>54 - 58 (>414 - 418**)	K, L, M, N
>58 - 77 (>418 - 437**)	L, M, N
>77 - 81 (>437 - 441**)	L, M, N, P
>81 - 99 (>441 - 459**)	M, N, P
>99 - 103 (>459 - 463**)	M, N, P, Q
>103 - 122 (>463 - 482**)	N, P, Q
>122 - 126 (>482 - 486**)	N, P, Q, R
>126 - 144 (>486 - 504**)	P, Q, R
>144 - 148 (>504 - 508**)	P, Q, R, A
>148 - 167 (>508 - 527**)	Q, R, A
>167 - 171 (>527 - 531**)	Q, R, A, B
>171 - 189 (>531 - 549**)	R, A, B
>189 - 193	R, A, B, C
>193 - 212	A, B, C
>212 - 216	A, B, C, D
>216 - 234	B, C, D
>234 - 238	B, C, D, E
>238 - 257	C, D, E
>257 - 261	C, D, E, F
>261 - 279	D, E, F
>279 - 283	D, E, F, G
>283 - 302	E, F, G
>302 - 306	E, F, G, H
>306 - 324	F, G, H
>324 - 328	F, G, H, J
>328 - 347	G, H, J
>347 - 351	G, H, J, K

* As read on PPCS or Control Room instruments.

** > 360 as read on chart recorder.

ATTACHMENT B
GENERAL EMERGENCY OFFSITE PROTECTIVE ACTIONS



(1) Situations requiring urgent action by offsite officials (based on control room indicators, no dose projections required).

(2) >30,000 R/hr in containment high radiation monitors.

(3) LOSS criteria for RCS barrier in EPIP 1.2, Attachment C, exceeded.

(4) LOSS criteria for containment barrier in EPIP 1.2, Attachment C, exceeded.

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 5.2.1
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.

ATTACHMENT C
REINSTALLATION OF WEDAP SOFTWARE

2.3 Return to EPIP 1.3, Step 5.2.20 **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 5.2.20 **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

ATTACHMENT C
REINSTALLATION OF WEDAP SOFTWARE

2.5.14 Select "Not Shared" and "Next" arrow

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 5.2.20.

EPIP 4.3

EMERGENCY OPERATIONS FACILITY (EOF) ACTIVATION AND EVACUATION

DOCUMENT TYPE: Technical

CLASSIFICATION: NNSR

REVISION: 30

EFFECTIVE DATE: August 29, 2003

REVIEWER: N/A

APPROVAL AUTHORITY: Department Manager

PROCEDURE OWNER (title): Group Head

OWNER GROUP: Emergency Preparedness

Verified Current Copy: _____ _____ _____
Signature Date Time

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_____ _____ _____

_____ _____ _____

TABLE OF CONTENTS

1.0 PURPOSE

This procedure provides instructions for the activation of the Emergency Operations Facility (EOF). The EOF is activated upon declaration of an ALERT, or higher classification, or at any other time deemed necessary by the Shift Manager (SM). Activation of the EOF does not require the declaration of an emergency. Attachment A, Emergency Operations Facility Layout, describes the facility layout.

This procedure also describes the method by which the EOF and Offsite Radiation Protection Facility (OSRPF) is evacuated and responsibilities transferred.

2.0 PREREQUISITES

2.1 Responsibilities

2.1.1 Emergency Director:

a. Directs the overall management of the emergency response and recovery operations, including requests for federal assistance.

b. Upon activation of the EOF, assumes a formal turnover from the SM for non-delegable responsibilities, including:

- Classification/Re-classification of emergencies
- Protective Action Recommendations
- Notification of Federal, State, and County authorities
- Authorizing the use of potassium iodide
- Authorizing emergency radiation dose extensions

c. Decision to evacuate the EOF and OSRPF and relocate to alternate areas.

2.1.2 EOF Manager:

a. EOF activation prior to the arrival of the Emergency Director.

b. Commands and controls the EOF emergency response activities.

2.1.3 Dose/PAR Coordinator:

a. Directs the Offsite Radiation Protection Facility Coordinator to activate the EOF emergency ventilation system per Attachment B, Operation of the EOF Emergency Ventilation System & Annunciator Panel.

b. Activates the Wisconsin Electric Dose Assessment Program - WEDAP per EPIP 1.3, Dose Assessment and Protective Action Recommendations.

c. Initiates the activation of the Iodine and Noble Gas (ING) Monitors per Attachment D, Activation of the Iodine and Noble Gas (ING) Radiation Monitors.

d. Directs offsite dose assessment. Develops Protective Action Recommendations (PARs) based on dose for the Emergency Director's approval.

2.1.4 Plant Status Monitor:

a. Activates Plant Process Computer System (PPCS) workstation per Attachment E, Plant Process Computer System (PPCS).

b. Supports event monitoring by serving as the resource for plant and environmental data. Maintains plant status boards.

2.1.5 ERF Communicator - Maintains continuous communications between the CR, TSC, EOF and JPIC. Assists with event classification.

2.1.6 Dose/PAR Monitor - Supports radiological response by serving as resource for offsite assessment of radiological conditions and assists with development of Protective Action Recommendations (PARs) based on dose. Maintains rad/met status boards.

2.1.7 HPN/SRC Communicator - Communicates information to NRC and State of Wisconsin Department of Health and Family Services - State Radiological Coordinator.

2.1.8 State/County Communicator - Communicates information to State and County agencies.

2.1.9 State Liaison - Ensures that the State of Wisconsin has adequate information to implement offsite emergency plans. Reports to the State Emergency Operations Center.

2.1.10 County Liaison - Ensures that Kewaunee County and Manitowoc County has adequate information to implement offsite emergency plans. Reports to the County Emergency Operation Centers.

2.1.11 Resource Coordinator - Obtains resources needed for emergency response, including communications with supporting agencies.

2.1.12 Offsite Assembly Area Coordinator - Assists the Security Coordinator in controlling site ingress/egress, including release and/or evacuation of personnel to offsite assembly areas.

2.1.13 Administrative Support Leader - Provides clerical and administrative support to emergency organization.

2.2 Equipment

2.2.1 EOF inventory per EPMP 1.3, Routine Inventory of TSC, EOF, AEOF, JPIC and OSC Emergency Preparedness Supplies.

2.2.2 PPCS Workstations

2.2.3 WEDAP Workstation

2.2.4 Communications equipment per EPMP 2.1, Testing of Communications Equipment.

3.0 PRECAUTIONS AND LIMITATIONS

Evacuation of the EOF shall include the coordination of the evacuation for the OSRPF.

4.0 INITIAL CONDITIONS

4.1 This procedure shall be implemented upon declaration of an ALERT or higher classification or at the discretion of the Shift Manager to provide the Control Room support with offsite interfaces.

4.2 Evacuation of the EOF and OSRPF shall be completed when any of the following conditions exist.

4.2.1 Emergency response personnel radiation doses in the EOF/OSRPF are exceeding or are projected to exceed the following for the duration of the event:

a. Whole body (TEDE) 4 rem (calculated)

b. Thyroid (CDE) 25 rem (calculated)

4.2.2 Other emergency conditions exist (i.e., fire, toxic or flammable gases, or loss of power).

5.0 PROCEDURE

5.1 Activation

5.1.1 The EOF Manager shall ensure the completion of the EOF Position Instruction Manual 4.2, EOF Manager.

NOTE: The facility may be activated earlier based upon the EOF Manager's discretion if determined there is an understanding of the events in progress and adequate staffing resources in place to respond to the emergency.

5.1.2 Minimum staff positions are:

a. Emergency Director

b. EOF Manager

c. Dose/PAR Coordinator

d. State/Counties Communicator

e. ERF Communicator

f. OSRPF Coordinator

g. Resource Coordinator

5.1.3 The EOF emergency ventilation system, iodine and noble gas (ING) radiation monitors, and PPCS equipment shall be activated per the attachments to this procedure.

5.1.4 Each ERO position shall activate and assume their area of responsibility and function within the EOF using their Position Instruction Manual.

5.2 Evacuation

5.2.1 The EOF and OSRPF will be evacuated under the direction of the EOF Manager.

5.2.2 The key to an orderly evacuation is good communications, formal turnover with personnel assuming EOF and OSRPF responsibilities, and documentation of actions and notifications.

5.2.3 Minimize the number of vehicles used to transport people and equipment to other facilities.

a. The Alternate Offsite Radiation Protection Facility is the KNPP Site Boundary Facility (SBF) located about one mile west of KNPP on Kewaunee County Nuclear Road per Attachment F, WPS - KNPP Site Boundary Facility.

b. The Alternate EOF (AEOF) is located in the Wisconsin Public Service corporate office at 700 North Adams Street, Green Bay, WI in Room D2-3 (per Attachment G, AEOF - Green Bay). Data from the PPCS is obtained per Attachment H, Activation Of The Remote PPCS WAVE Application.

5.2.4 Transfer responsibility for all communications to the TSC until the AEOF is activated. Some communicators may temporarily relocate to that facility prior to activation of the AEOF.

5.2.5 Transfer responsibility for the OSRPF oversight and offsite dose assessments for protective action recommendations to the TSC.

5.2.6 Ensure all personnel are accounted for after reaching the relocation area(s).

5.2.7 Activate the AEOF by each ERO position reassuming their area of responsibility and function using their Position Instruction Manual.

5.2.8 Develop an immediate plan for reentry of the EOF/OSRPF area, if possible.

6.0 REFERENCES

6.1 Point Beach Nuclear Plant Emergency Plan

6.2 EPIP 1.3, Dose Assessment and Protective Action Recommendations

6.3 EPIP 4.7, Offsite Radiation Protection Facility (OSRPF) Activation and Evacuation

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

6.5 EPMP 2.1, Testing of Communications Equipment

6.6 PIM EOF 4.1, Emergency Director

6.7 PIM EOF 4.2, EOF Manager

6.8 PIM EOF 4.3, Administrative Support Leader

6.9 PIM EOF 4.4, Resource Coordinator

6.10 PIM EOF 4.5, Dose/PAR Coordinator

6.11 PIM EOF 4.6, Dose/PAR Monitor

6.12 PIM EOF 4.7, HPN/SRC Communicator

6.13 PIM EOF 4.10, State/County Communicator

6.14 PIM EOF 4.11, State Liaison

6.15 PIM EOF 4.12, County Liaison

6.16 PIM EOF 4.13, Offsite Assembly Area Coordinator

6.17 PIM EOF 4.14, ERF Communicator

6.18 PIM EOF 4.15, Plant Status Monitor

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

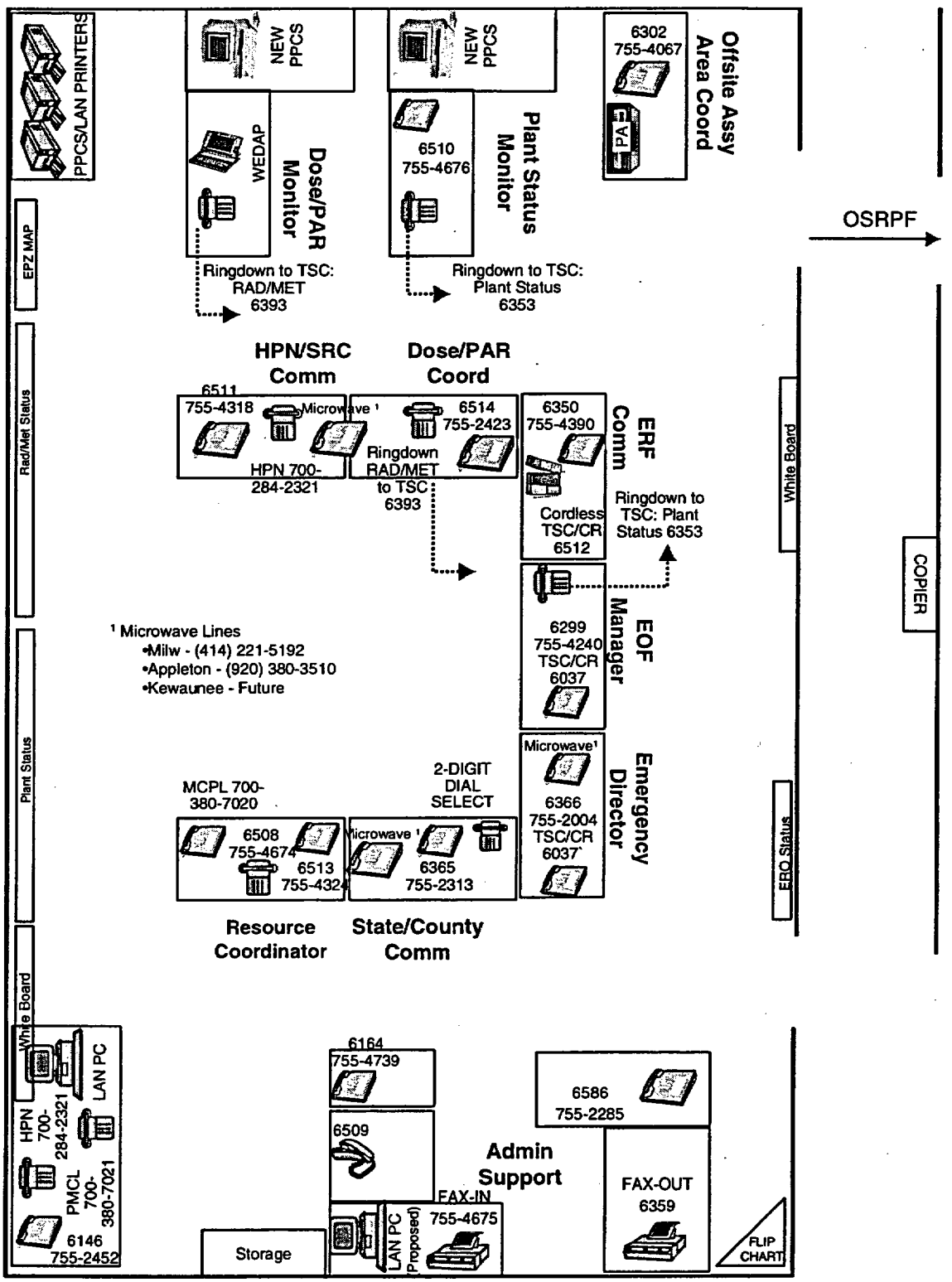
B-3 NUREG 0654, Criteria for Preparation and Evaluation of Radiological Response Plans and Preparedness in Support of Nuclear Power Plants

B-4 NUREG-0737, Clarification of TMI Action Plan Requirements

B-5 Calculation 2002-0017, RE-242 High Alarm Setpoint Analysis, 8/19/02

B-6 CA025588, SBCC RMS Alarms

ATTACHMENT A
EMERGENCY OPERATIONS FACILITY LAYOUT



ATTACHMENT B
OPERATION OF THE EOF EMERGENCY VENTILATION SYSTEM & ANNUNCIATOR PANEL
Page 1 of 2

NOTE: Contact the Control Room prior to implementing this procedure to advise them of the RMS alarm they will be receiving.

1.0 DESCRIPTION - EMERGENCY VENTILATION SYSTEM

The EOF's emergency ventilation system has a normal and emergency operation mode. Under all modes of operation, fresh air is taken in from the vent on the south end of the west side of the building. Under normal conditions the air is filtered by roughing and electrostatic filters. In the emergency mode, a minimum amount of outside air is taken into the building and incoming air is routed through an additional high efficiency particulate filter.

2.0 EMERGENCY OPERATION OF THE EMERGENCY VENTILATION SYSTEM

2.1 The control panel for the SBCC ventilation system (M1) is located in the mechanical equipment room. Access to the mechanical equipment room is through the men's restroom and locker area.

2.2 To shift from the normal to the emergency mode, manually place the switch S3 on panel M1 to the "Emergency" position.

3.0 EMERGENCY OPERATIONS POWER SUPPLY

Electrical power to the Site Boundary Control Center, and therefore the EOF, is provided by Wisconsin Public Service Corporation (WPSC) via a distribution feeder. In case of loss of electrical power, call WPSC. The telephone number for WPSC can be found in the Emergency Telephone Directory.

4.0 DESCRIPTION - EOF ANNUNCIATOR PANEL

4.1 The EOF's annunciator panel monitors eight parameters in the Site Boundary Control Center building. The control room may receive a common alarm upon annunciation of some of the eight alarms.

4.1.1 Holding tank high level - alarms on high level, holding tank must be pumped by a contractor.

4.1.2 Dosing tank high level - alarms on high level.

4.1.3 Fire detector - annunciates upon detection of a fire.

4.1.4 Emergency mode - annunciates when building HVAC system is switched to the emergency mode.

ATTACHMENT B
OPERATION OF THE EOF EMERGENCY VENTILATION SYSTEM & ANNUNCIATOR PANEL

4.1.5 Building temperature low - annunciates upon exceeding the setpoint for the building temperature. This usually indicates a heating system failure.

4.1.6 Pump failure - annunciates whenever a pump associated with control panel M1, does not start on demand, after a 30-second time delay.

4.1.7 Air filter plugged - annunciates when the electrostatic air filter is plugged and the differential pressure across the filter exceeds the setpoint.

4.1.8 Compressed air low pressure - annunciates when the air pressure in the supply header to the Johnson Controls control system falls below the setpoint.

4.2 Response to annunciator panel alarms.

4.2.1 Be prepared to respond to the Control Room questions regarding the cause of the alarm.

4.2.2 Take actions and/or call for the assistance as required.

ATTACHMENT C
DELETED - MOVED TO EPIP 1.3

ATTACHMENT D
ACTIVATION OF THE IODINE AND NOBLE GAS (ING) RADIATION MONITORS
Page 1 of 2

Coordinate with the Offsite Radiation Protection Coordinator:

1.0 ACTIVATION

1.1 Install a new charcoal filter in the Iodine and Noble Gas Monitor.

1.2 Start the iodine and noble gas sample pump in the heating and ventilation room adjacent to the men's lavatory.

1.3 Record the initial sample flow rate and start time.

Flow Rate _____ Start Time _____

2.0 INTERPRETATION OF RMS READOUTS

2.1 The concentration of noble gas is determined by multiplying the observed count rate on the readout labeled "RE-242" by the calibration constant posted adjacent to the meter. The resulting units are µCi/cc Xe-133 dose equivalents.

2.2 The iodine activity on the charcoal cartridge is obtained by multiplying the observed count rate on the readout labeled "RE-241" by the calibration constant posted adjacent to the meter. The resulting units are µCi - I-131 dose equivalents.

2.3 Calculation 2002-0017 determined for RE-242 under LOCA accident conditions that each interval of 5000 cpm on the meter readout corresponds to a submersion dose rate of 100 mrem/hour in the environs outside the SBCC. (B-5) (B-6)

ATTACHMENT D
ACTIVATION OF THE IODINE AND NOBLE GAS (ING) RADIATION MONITORS
Page 2 of 2

2.4 To convert the iodine activity into a concentration, calculate the volume of air that passed through the filter. The concentration of iodine is approximately the activity on the filter (μCi) divided by the total volume (cm^3) for sampling periods less than 12 hours, this assumes no short-lived isotopes are present.

NOTE: For longer sampling periods and when short-lived iodine isotopes are expected to be present, the following formula may be used to calculate the iodine concentration:

$$C = \frac{(\lambda A e^{\lambda t})^{t}s}{F\, p(1-e^{-\lambda t}s)}$$

Where:			Units
C	=	concentration in air	μCi/cc
F	=	sample volume	cc
λ	=	decay constant, $0.693T^{1}/_{2}$	min^{-1}
A	=	total activity on filter	μCi
t	=	elapsed time from sample stop to count start	min
^{t}s	=	total sample time	min
p	=	filter collection efficiency	

Any changes to the alarm setpoints shall be made in accordance with the Radiation Monitoring System Alarm Setpoint & Response Book (RMSASRB) kept in the Control Room.

ATTACHMENT E
PLANT PROCESS COMPUTER SYSTEM (PPCS)
Page 1 of 8

NOTE 1: Use PPCS terminal drops 121 (TSC) and 125 (EOF) to display the plant status board.

NOTE 2: Use PPCS terminal drops 122 (TSC) and 126 (EOF) to display the rad/met status board.

NOTE 3: If the PPCS workstation is inoperable, you can access PPCS data on a LAN computer per EPIP 4.3, Attachment H, Activation of the Remote PPCS Wave Application.

1.0 PPCS START UP (applies to all PPCS monitor drops)

1.1 Turn on the monitors, if not already on.

1.2 Check if the affected unit is selected. PB1@PPCS or PB2@PPCS displayed in the lower right hand corner of screen.

1.3 **IF** the affected unit is selected,
THEN go to Step 1.13

NOTE: The computer reboots when changing between units.

1.4 **IF** the affected unit is not selected on the PPCS screen,
THEN obtain the PPCS user name and password from the envelope in the sealed facility storage cabinet.

1.5 Select the arrow above the menu icon and left click to bring up the WDPF Main Menu.

1.6 Click on the user/login menu:

NOTE 1: The user name and password are case sensitive (i.e. make sure Cap Locks is off).

NOTE 2: If multiple attempts to enter the user/login password fail, the system will lock out the drop for approximately 15 minutes before allowing a login to occur.

1.7 Enter the user name and password.

1.8 Left click on login.

1.9 Click on PB1@PPCS or PB2@PPCS in the lower right corner to bring up the "Change Unit" window.

1.10 Click on the desired unit, PB1@PPCS or PB2@PPCS, in the "Change Unit" window pull down menu.

1.11 Click on "OK".

1.12 Click on "OK" in response to the "Change Unit Warning".

NOTE: You do not need to select "acknowledge" for the shutdown and reboot to occur.

1.13 Turn on the overhead projector by depressing the power (O/I) switch at the front of the unit.

2.0 DISPLAY OF PPCS DATA

2.1 To display the Plant Status Board (PSB), go to Step 2.1.1, OR to display the Rad/Met Status Board proceed to step 2.2.

2.1.1 Select window number (W1) from the menu bar.

NOTE: The DIRECTORY screen provides a display of all the screens available to the PPCS user.

2.1.2 Click the DIRECTORY icon at the bottom of the screen to bring up the DIRECTORY window.

2.1.3 Click on the Plant Status Board button under Miscellaneous (2225 for Unit 1 or 2725 for Unit 2) in the DIRECTORY window.

NOTE: If unable to view the menu bar, move the cursor to the very bottom of the screen and click, downsize the displayed window, or move the displayed window to the back of the desktop.

2.1.4 Select window number (W5) from the menu bar. This selects the window for the projected image.

2.1.5 To display the Plant Status Board screen with the projector:

a. Click the DIRECTORY icon at the bottom of the screen to bring up the DIRECTORY window.

b. Move the mouse to the far right (off the monitor screen and onto the projected screen) and click on the Plant Status Board button under Miscellaneous (2225 for Unit 1 or 2725 for Unit 2) from the DIRECTORY window.

2.1.6 Go to Step 2.3 to manually enter data onto the projected screen and to Step 2.4 to trend plant data.

2.2 Displaying the Rad/Met Status Board

2.2.1 Select window number (W1) from the menu bar.

NOTE: The DIRECTORY screen provides a display of all the screens available to the PPCS user.

2.2.2 Click the DIRECTORY icon at the bottom of the screen to bring up the DIRECTORY window.

2.2.3 Click on the Rad/Met button under Miscellaneous (2226 for Unit 1 or 2726 for Unit 2) from the DIRECTORY window.

NOTE: If unable to view the menu bar, move the cursor to the very bottom of the screen and click, downsize the displayed window, or move the displayed window to the back of the desktop.

2.2.4 Select window number (W5) from the menu bar. This selects the window for the projected image.

2.2.5 To display the Rad/Met Status Board screen with the projector:

a. Click the DIRECTORY icon at the bottom of the screen to bring up the DIRECTORY window.

b. Move the mouse to the far right (off the monitor screen and onto the projected screen) and Click on the Rad/Met Status Board button under Miscellaneous (2226 for Unit 1 or 2726 for Unit 2) from the DIRECTORY window.

2.2.6 Go to Step 2.3 to manually enter data onto the projected screen and to Step 2.5 to trend Radiation Monitoring System (RMS) data.

ATTACHMENT E
PLANT PROCESS COMPUTER SYSTEM (PPCS)
Page 4 of 8

2.3 Manual Entry of Data Fields

2.3.1 Move the mouse to the far right (off the monitor screen and onto the projected screen).

2.3.2 Click on the desired blue outlined block(s) to select the area for data or information entry.

NOTE: Use capital letters to increase the readability of the projected image.

2.3.3 Type the data or information to be displayed.

2.3.4 After updating the status board, print the applicable PPCS window in accordance with Step 3.0.

NOTE: All trends are viewed on the drop's monitor, not the projected image.

2.4 View and Trend Plant Status Data

2.4.1 Ensure a different window number W-2, W-3, or W-4 is selected.

2.4.2 Click on the plant system to be viewed or trended from the DIRECTORY screen.

2.4.3 Move the cursor to the desired data point (e.g. temperature, pressure).

2.4.4 Right click to bring up the menu window.

2.4.5 Left click on the menu option desired (Information or Mini-Trend). The information or trend will be displayed on the monitor screen.

2.4.6 If desired, groups or selected data points may be displayed by using the Trend Group Attribute Window by performing the following:

a. Left click on the Graphics icon on the lower tool bar to bring up the "Trend Display" window.

ATTACHMENT E
PLANT PROCESS COMPUTER SYSTEM (PPCS)
Page 5 of 8

b. Click on "Create".

c. Click on "Live Trend".

d. Click on "Modify Properties" to bring up the "Group Attributes Window".

e. To display a group, click on "Copy from Group" and perform Steps 2.4.6.f-g. If an individual data point is desired to be trended go directly to Step 2.4.6 h.

f. Click on the group you wish to trend from the Group listing in the "Select a Group" window.

g. Click "Apply", which closes the Select a Group window and then go to Step 2.4.6 l.

h. To display an individual point, click on "Add Point" on the Group Attribute Window.

NOTE 1: Up to eight (8) data points may be trended in each Trend Display Window.

NOTE 2: The point names may be found on the group listing as described in Step 2.4.6 f above. A list of Point Names is also available on an operator aid at the Plant Status Board work areas.

i. Enter the point name (e.g. LT972 or 1RE211).

j. Click on "OK".

k. Continue to add points by repeating Steps 2.4.6 h. – j.

l. Select and change the live time interval, if desired.

m. Change the graph scales, if desired, by performing the following:

- Click on the point you which to change the scale.
- Click on modify.

- Click on "Default" in Scale Limits
- Select "User Entered" from menu
- Select linear or logarithmic scale
- Enter the High scale value in the High block
- Enter the Low scale value in the Low block
- Click on "OK".

n. Click on "Apply." The graph will appear and display the information.

2.5 View and Trend Radiation Monitoring System (RMS) Data.

2.5.1 Ensure a different window number W-2,W-3, or W-4 is selected and then click on the RMS grid icon (2260 for Unit 1 and 2760 for Unit 2) from the DIRECTORY. The RMS Grid should be displayed.

2.5.2 Move the cursor to the desired RMS monitor number to be viewed or trended on the RMS Grid.

2.5.3 Right click to bring up the menu window.

2.5.4 Left click on the menu option desired (Information or Mini-Trend). The information or trend will be displayed on the monitor screen.

2.5.5 If desired, selected RMS points may be displayed by using the Trend Group Attribute window by performing Step 2.4.6.

2.5.6 To view the RMS history bar graph trends (last 24-1 minute periods, 24-10 minute periods, 24 hours, or 24 days) click on the box in front of the desired RMS monitor.

ATTACHMENT E
PLANT PROCESS COMPUTER SYSTEM (PPCS)
Page 7 of 8

3.0 PRINTING PPCS SCREENS

3.1 If the background area behind the windows is not exposed, reduce the window size slightly.

NOTE: **A screen printout may be obtained by following Step 3.2. Select "Print Screen" instead of "Snapshot." No further actions are needed and the printout is routed automatically to the color printer.**

3.2 With the cursor over the background area, hold down the right mouse button and scroll down until "Snapshot" is highlighted, then release the right button.

3.3 In the SNAPSHOT window, select HIDE WINDOW DURING CAPTURE and then click on the SNAP button. "Select Window" will appear on the bottom of the window.

NOTE: **It takes approximately 5-8 seconds for the snapshot to be recorded. If you do not left click on the window desired within approximately 8 seconds after "Select window" is displayed, the snap process will stop.**

3.4 Within 5 seconds of clicking on the SNAP button, left click on the window you desire to print. "Snap Succeeded" will appear on the bottom of the snapshot window after 5-8 seconds.

3.5 Click on "View" in the SNAPSHOT window. The Image Tool (V3.6FCS) window will appear and display the captured window.

3.6 Click on File>Print Preview on the Image Tool (V3.6FCS) window to preview the image to be printed. Do not confuse this with the Image Tool: Palette, which is not used and may be closed, if desired.

3.7 Click on File>Print on the Image Tool (V3.6FCS) window to display the tools used to modify the size and orientation of the print image.

3.8 Make adjustments to the orientation and size of the printed image:

3.8.1 Select the orientation (landscape or portrait).

3.8.2 Scale the size of the image using the slider or △▽ buttons, while viewing the image on the Image Tool Print Preview window.

ATTACHMENT E
PLANT PROCESS COMPUTER SYSTEM (PPCS)
Page 8 of 8

3.9 When in the TSC, select:

3.9.1 TSCLJ to print black and white.

3.9.2 TSCSC to print color.

3.10 When in the EOF, select:

3.10.1 SBCLJ to print black and white.

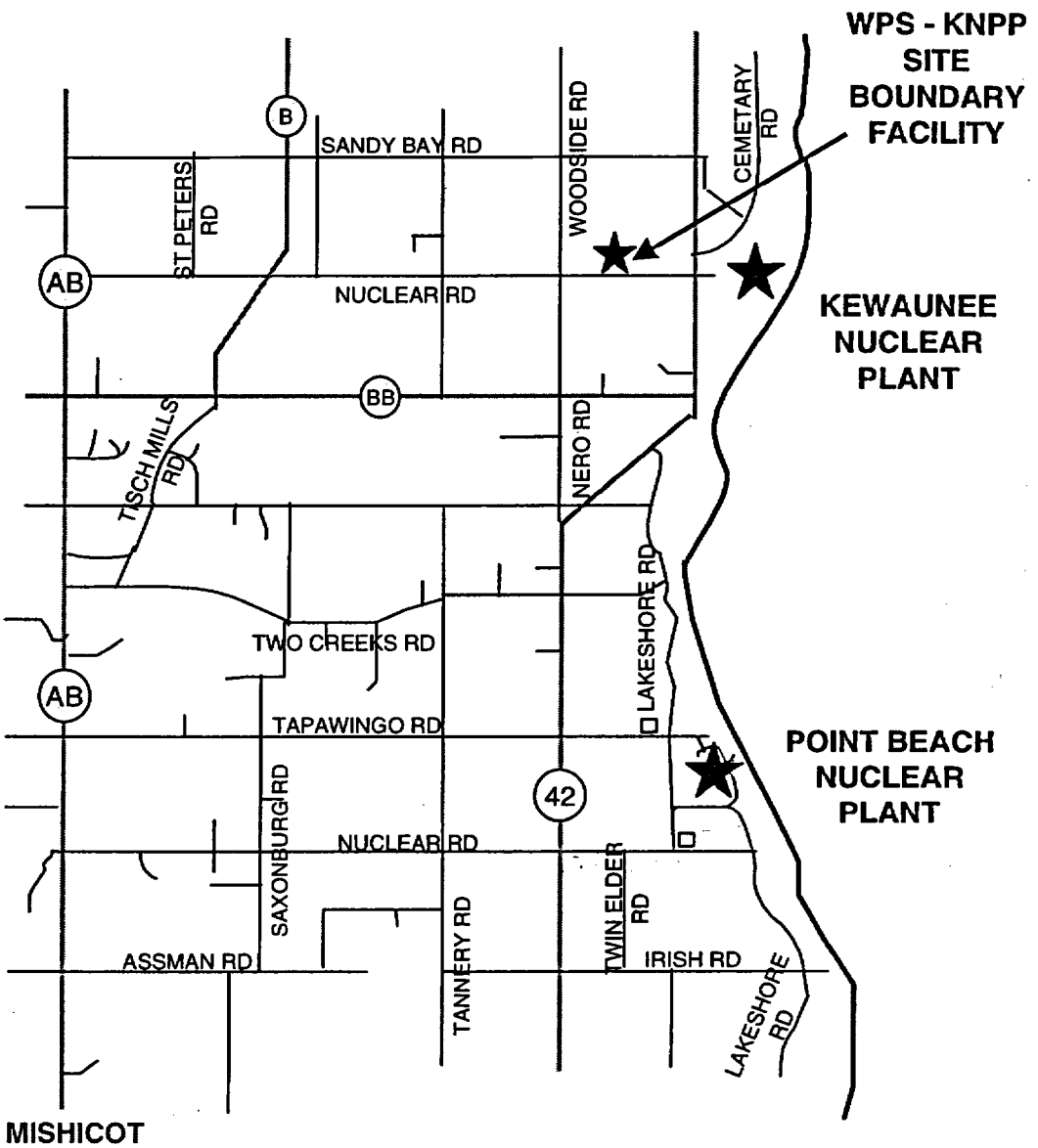
3.10.2 SBCSC to print color.

3.11 Click on "Print" in the Print or Print Preview window to print the selected screen.

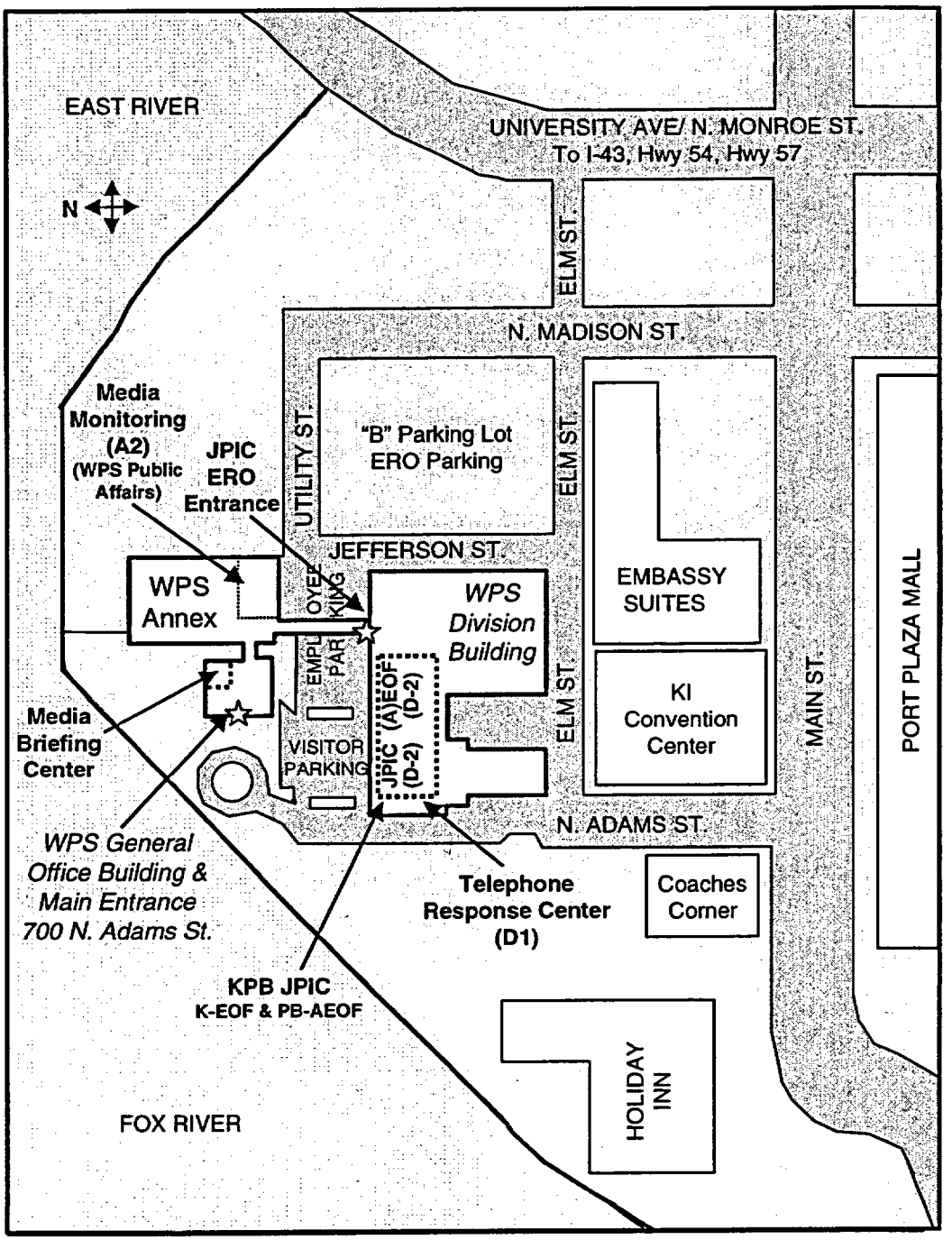
3.12 **IF** the printer fails to print in the TSC,
THEN check the ethernet switches on TSC-T on the rack in the Southwest corner wall rack are plugged in.

3.13 **IF** the printer fails to print in the EOF,
THEN contact security to open the door to the Switch Room in the SBCC and check the ethernet switches on SBC-T are plugged in.

ATTACHMENT F
WPS - KNPP SITE BOUNDARY FACILITY



ATTACHMENT G
ALTERNATE EMERGENCY OPERATIONS FACILITY (AEOF)
700 NORTH ADAMS STREET, GREEN BAY
Page 1 of 2



Take I-43 north to Green Bay - Exit 187 Webster Avenue. Go south to University Avenue. Take University Avenue west across the East River to the next intersection, Elm Street. Take Elm Street west to N. Adams Street

ATTACHMENT G
ALTERNATE EMERGENCY OPERATIONS FACILITY (AEOF)
700 NORTH ADAMS STREET, GREEN BAY
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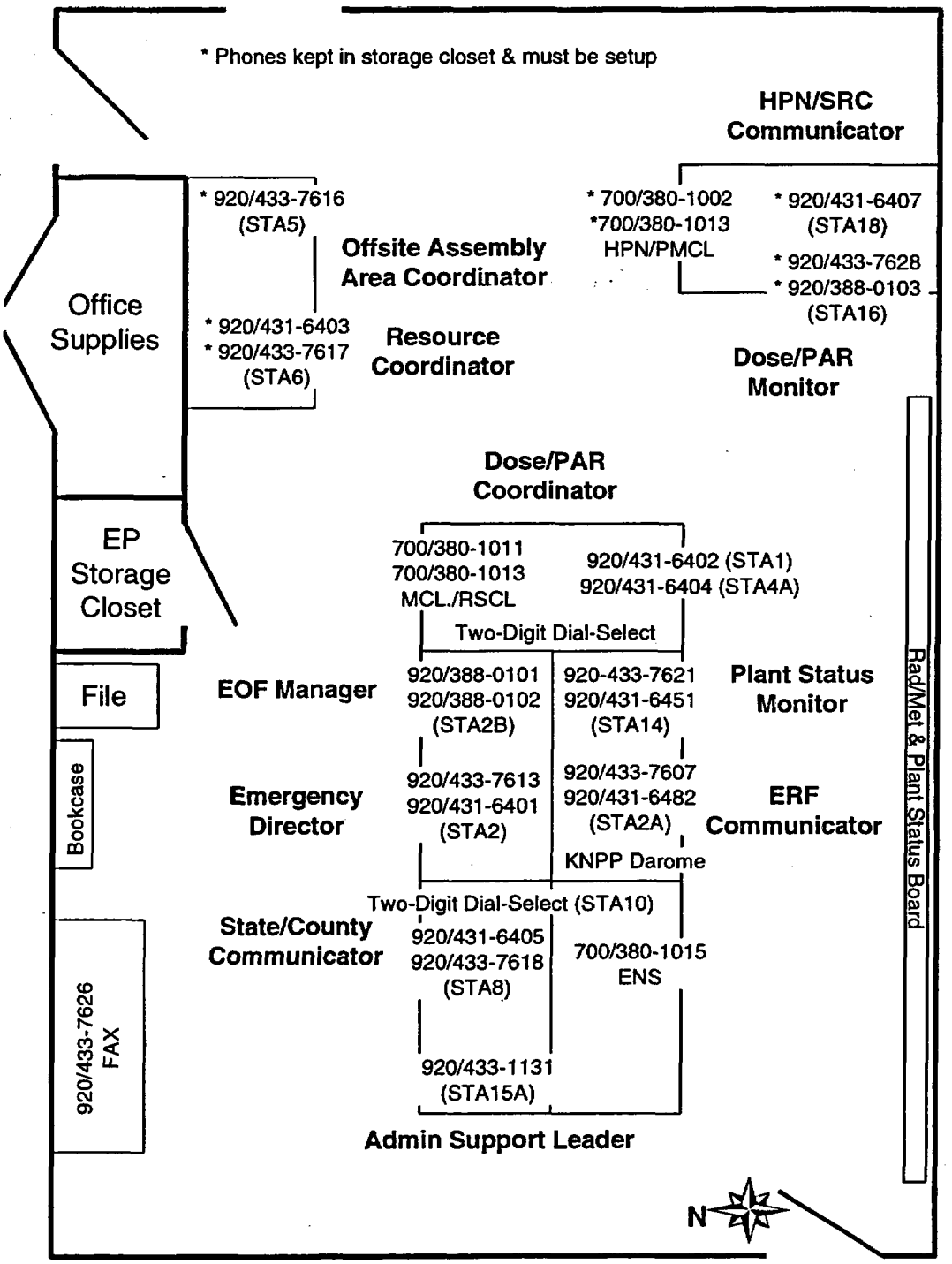

ATTACHMENT H
ACTIVATION OF THE REMOTE PPCS WAVE APPLICATION
Page 1 of 2

CAUTION

Periodically verify PPCS WAVE data is identical to PPCS data displayed at another emergency response facility.

1.0 For using the PBNP AEOF WAVE/WEDAP Notebook PC, complete the following steps **OR** go to Step 2.0 if using a Point Beach LAN computer in the TSC or EOF.

1.1 Connect PC to analog telephone line and power up PC.

1.2 Perform steps to logon by following the "Windows 2000 Project LAPTOP Dial-Up Instructions". (Located with Laptop Computer)

2.0 Log in to the computer dialog box using your assigned day-to-day ID and password.

3.0 Open Internet Explorer.

NOTE: **It will take a few minutes for the Java applet software to load.**

4.0 Enter **ppcsprd01n** to navigate to the PPCS web server. (Java applet will load and initialize).

5.0 When the initial unit selection screen appears, select Unit 1 or Unit 2.

ATTACHMENT H
ACTIVATION OF THE REMOTE PPCS WAVE APPLICATION
Page 2 of 2

6.0 To display PPCS Directory, select "Display Process Diagram".

6.1 Select and click on the PPCS screen to be displayed.

6.2 Select Diagram Main Menu from the tool bar to return to the PPCS Directory or to display other PPCS screens.

7.0 To display information from a PPCS point, select Display Point Information.

8.0 To create a trend graph, perform the following:

8.1 Press the Groups button, **THEN** set the Plot Properties.

8.2 Select the desired points to trend.

8.3 **IF** required, select and change the Time Intervals.

8.4 After the graph is created, press the Tabular Trend button to view the data values.

9.0 To generate a data point review, select Display Point Review from PPCS HSR.