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NPL 2000-0091

February 22, 2000

Document Control Desk
U.S. NUCLEAR REGULATORY COMMISSION
Mail Station P1-137
Washington, DC 20555

Ladies/Gentlemen:

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

Enclosed are copies of revised procedures to the Point Beach Nuclear Plant Emergency Plan Implementing Procedures. The revised procedures dated January 26, 2000, and February 18, 2000, should be filed in your copies of the manual in accordance with the attached instructions.

Sincerely,



A. J. Cayia
Manager,
Regulatory Services & Licensing

tat

Enclosures

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

A045

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

1. EPIP Index, Revision 63.
2. EPIP 1.1, Course of Actions, Revision 35.

NUCLEAR POWER BUSINESS UNIT
EMERGENCY PLAN IMPLEMENTING PROCEDURES

EPIP INDEX
Revision 63
January 26, 2000

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EPIP 1.1

COURSE OF ACTIONS



*Wisconsin
Electric
Power Company*

DOCUMENT TYPE: Technical

CLASSIFICATION: NNSR

REVISION: 35

EFFECTIVE DATE: January 26, 2000

REVIEWER: Qualified Reviewer

APPROVAL AUTHORITY: Department Manager

PROCEDURE OWNER (title): Group Head

OWNER GROUP: Emergency Preparedness

List pages used for Partial Performance

Controlling Work Document Numbers

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COURSE OF ACTIONS

1.0 PURPOSE

This procedure provides instructions for Control Room personnel responding to an off-normal event at the Point Beach Nuclear Plant (PBNP).

2.0 PREREQUISITES

2.1 Responsibilities

- 2.1.1 The Duty Shift Superintendent (DSS) is responsible for this procedure.
- 2.1.2 The DSS is responsible for taking immediate actions to mitigate the consequences of the emergency.
- 2.1.3 The DSS is responsible for implementing Emergency Plan Implementing Procedures (EPIPs) as referenced by this procedure until formally relieved by key personnel in emergency response facilities.
- 2.1.4 The DSS may delegate assignments to qualified personnel as necessary.

2.2 Equipment

None

3.0 PRECAUTIONS AND LIMITATIONS

None

4.0 INITIAL CONDITIONS

An off-normal occurrence exists (or has existed) at PBNP.

5.0 PROCEDURE

NOTE 1: Steps may be completed out of sequence, as appropriate.

NOTE 2: Steps already formally turned over to Emergency Response Facilities (per Step 5.18) may be marked "not applicable."

5.1 Implement procedures, or take other actions as required, to place the affected unit(s) in a safe condition. _____

5.2 Verify the on-shift Shift Technical Advisor (STA) is in the Control Room. _____

INITIALS

COURSE OF ACTIONS

INITIALS

5.3 Direct the Security Shift Commander to report to the Control Room. _____

5.4 Evaluate the event using EPIP 1.2, Emergency Classifications, for classification. _____

5.5 Complete the appropriate sections of Attachment A, Announcement of Classified Event. _____

5.6 Sound the evacuation alarm and make the plant Gai-Tronics announcement using the completed Attachment A, Announcement of Classified Event. _____

NOTE: If the event is classified as a GENERAL EMERGENCY, then minimum protective action recommendations are required, (per Attachment B).

- Evacuate 0-2 miles, all sectors
- Evacuate 2-5 miles, downwind sectors (3-4)

5.7 Complete all notifications per EPIP 2.1, "Notifications - ERO, State & Counties, and NRC." _____

NOTE: Assign personnel to make each notification.

5.7.1 State & Counties (**within 15 minutes of declaration**)
Use EPIP 2.1, Section 5.2 and Attachment B, Nuclear Accident Reporting Form. _____

5.7.2 Emergency Response Organization (**pager activation**)
Use EPIP 2.1, Section 5.1. _____

5.7.3 W.E. Media Line and KNPP
Use EPIP 2.1, Section 5.3. _____

5.7.4 Nuclear Regulatory Commission (NRC) (immediately after State & County notifications, **NOT to exceed 60 minutes** from declaration).
Use EPIP 2.1, Section 5.4. _____

5.8 **IF** emergency involves plant conditions which suggest a radioactive release is in progress or anticipated,
THEN initiate EPIP 1.3, Dose Assessment and Protective Action Recommendations. _____

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- 5.9 **IF** a backshift or weekend,
THEN contact the onshift Radiation Protection Technologist and Radiochemical Technician to report to the Control Room for further instructions in support of the event. (Reference EPIP 10.1, Emergency Reentry)
- 5.10 Assign reentry teams per EPIP 10.1, Emergency Reentry.
- 5.11 **IF** the event is an Unusual Event and additional staff is desired,
THEN call in personnel using the Emergency Response Organization (ERO) Call List, ETD 01.

CAUTION

If event is security related, then discuss the consequences of conducting an assembly and accountability with Security prior to implementation.

- 5.12 Implement the appropriate sections of EPIP 6.1, Assembly and Accountability, Release and Evacuation of Personnel, for the following circumstances:
- 5.12.1 Limited plant evacuation.
 - 5.12.2 Full-site assembly and accountability (Site Emergency or higher unless desired earlier).
 - 5.12.3 Release of personnel (no radiological impediments).
 - 5.12.4 Evacuation of site to offsite assembly areas (includes radiological monitoring prior to leaving the plant site).
- 5.13 **IF** Alert or higher,
THEN:
- 5.13.1 Activate Emergency Response Data System (ERDS) per EPIP 4.1, Attachment E, Activation of Emergency Response Data System (ERDS) (60 minutes of declaration).
 - 5.13.2 Issue high range dosimetry to Control Room personnel.
 - 5.13.3 Ensure backshift RPTs and RCTs have high range dosimetry.

COURSE OF ACTIONS

INITIALS

- 5.14 **IF** the event is a General Emergency **AND** the following criteria is met, **THEN** implement expanded PARS of evacuation for 0-5 miles all sectors and 5-10 miles downwind sectors. (Reference Step 6.13)
- 5.14.1 Substantial core damage in progress or projected (>20%) (> 30,000 R/hr in containment high radiation monitors)
- 5.14.2 Large fission product inventory in containment (more than GAP) (LOSS criteria for RCS barrier in EPIP 1.2, Attachment C, exceeded)
- 5.14.3 Imminent projected containment failure or release underway (LOSS criteria for containment barrier in EPIP 1.2, Attachment C, exceeded)
- 5.15 **IF** event involves a liquid release to the lake, **THEN** notify local water utilities per Offsite Agency Call List, ETD 02.
- 5.16 **IF** TSC and/or EOF are **NOT** activated, **THEN** ensure periodic status updates are provided to the State, Counties, and NRC per EPIP 2.1.
- 5.17 **IF** activating the Emergency Response Facilities, **THEN** provide a turnover briefing to TSC Manager upon arrival in the Control Room.
- 5.17.1 Plant status
- 5.17.2 Notifications status and current EPIP 2.1, Attachment B form
- 5.17.3 Protected Worker Log
- 5.17.4 Assembly and accountability status

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- 5.18 Conduct a formal turnover of responsibilities to Emergency Response Facilities as they are activated.
 - 5.18.1 Technical Support Center (TSC)
 - a. Plant assessment on classification recommendations per EPIP 1.2
 - b. Onsite protective actions
 - c. Onsite radiological assessment
 - d. NRC Notifications per EPIP 2.1
 - e. Assembly and Accountability, Release and Evacuation of Personnel per EPIP 6.1
 - 5.18.2 Operations Support Center (OSC)
 - a. Tracking dispatched reentry teams (repair, fire, search and rescue)
 - b. Tracking of non-PBNP/WE repair teams inside/outside protected area (switchyard, contractors, etc.)
 - c. Medical emergencies per EPIP 11.2
 - 5.18.3 Emergency Operations Facility (EOF)
 - a. Classification of emergencies per EPIP 1.2
 - b. Offsite protective action recommendations per EPIP 1.3
 - c. State and County notifications per EPIP 2.1
 - d. Overall management of ERO activities
 - e. Request for Federal Assistance, if needed
 - f. Review and approval of news releases technical content
 - g. Authorize the use of potassium iodide per EPIP 5.1
 - h. Authorize emergency radiation exposures in excess of 10 CFR 20 requirements per EPIP 5.2

COURSE OF ACTIONS

INITIALS

5.19 Initiate a condition report associated with the event and insert a copy in the Operations Notebook. (Reference Step 6.12)

6.0 REFERENCES

- 6.1 EPIP 1.2, Emergency Classifications
- 6.2 EPIP 1.3, Dose Assessment and Protective Action Recommendations
- 6.3 EPIP 2.1, Notifications - ERO, State & Counties, and NRC
- 6.4 EPIP 4.1, Attachment E, Activation of Emergency Response Data System (ERDS)
- 6.5 EPIP 5.1, Personnel Emergency Dose Authorization
- 6.6 EPIP 5.2, Radioiodine Blocking and Thyroid Dose Accounting
- 6.7 EPIP 6.1, Assembly and Accountability, Release and Evacuation of Personnel
- 6.8 EPIP 10.1, Emergency Reentry
- 6.9 EPIP 11.2, Medical Emergency
- 6.10 ETD 01, Emergency Response Organization (ERO) Call List
- 6.11 ETD 02, Offsite Agency Call List
- 6.12 IR 94-013, NPDP-94-014, Response to Notice of Violation, October 5, 1994
- 6.13 NUREG-0150, Volume 1, Revision 4, RTM-96, Response Technical Manual, Figures A-5 and A-6, March 1996

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, Revision 1, November 1980

COURSE OF ACTIONS

ATTACHMENT A
ANNOUNCEMENT OF CLASSIFIED EVENT

"ATTENTION ALL PERSONNEL. ATTENTION ALL PERSONNEL.

THERE ARE CONDITIONS AT THE PLANT THAT WARRANT A (AN)

- UNUSUAL EVENT
- ALERT
- SITE EMERGENCY
- GENERAL EMERGENCY

THESE CONDITIONS ARE:

(Announce if ALERT or higher) ALL ERO PERSONNEL REPORT TO YOUR ASSIGNED EMERGENCY RESPONSE FACILITY.

(IF filled in, THEN announce) AVOID THE FOLLOWING AREAS:

REPEAT ALARM AND ANNOUNCEMENT.

COURSE OF ACTIONS

ATTACHMENT B
AFFECTED SECTORS BASED ON WIND DIRECTION

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

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

* As read on PPCS or control room instruments.

** As read on chart recorder.

() Denotes sectors over Lake Michigan.

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1. EPIP Index, Revision 64.
2. EPIP 1.3, Dose Assessment and Protective Action Recommendations, Revision 26.
3. EPIP 2.1, Notifications - ERO, State & Counties, and NRC, Revision 19.
4. EPIP 6.1, Assembly and Accountability, Release and Evacuation of Personnel, Revision 17.

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EPIP 1.3

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS



*Wisconsin
Electric
Power Company*

DOCUMENT TYPE: Technical

CLASSIFICATION: SAFETY RELATED

REVISION: 26

EFFECTIVE DATE: February 18, 2000

REVIEWER: Managers Supervisory Staff

APPROVAL AUTHORITY: Department Manager

PROCEDURE OWNER (title): Group Head

OWNER GROUP: Emergency Preparedness

NAMES AND
TELEPHONE NUMBERS
DELETED

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

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DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

1.0 PURPOSE

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

2.0 PREREQUISITES

2.1 Responsibilities

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

2.2 Equipment

- 2.2.1 Meterological and Dose Assessment - Control Room (MAD-CR) Program
- 2.2.2 Radiation Monitoring System-System Server (RMS-SS)
- 2.2.3 Wisconsin Electric Dose Assessment Program (WEDAP)
- 2.2.4 Plant Process Computer System (PPCS)

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

3.0 PRECAUTIONS AND LIMITATIONS

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

4.0 INITIAL CONDITIONS

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

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

5.0 PROCEDURE

5.1 Meteorological And Dose Assessment - Control Room (MAD-CR)

5.1.1 Obtain and record the following information:

- a. Affected Unit: 1 / 2 / Both
- b. Number of Unit 1 purge exhaust fans in use: _____
- c. Number of Unit 2 purge exhaust fans in use: _____
- d. Atmospheric steam dump open? Y / N
- e. Number of SG safeties open on affected unit: 0 1 2 3 4
- f. Was containment spray used? Y / N
- g. Is the primary release path through the condenser? Y / N

NOTE: IF estimated release duration is unknown, THEN use 4 hours.

h. Estimated release duration: _____ hours.

NOTE: IF MAD-CR is NOT available, THEN go to Step 5.2 for assessment by using RMS-CT.

5.1.2 Verify MAD-CR dose projection program is available:

a. RMS-SS operable

- 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

- 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.

b. Successful log-on using operator aid attached to MAD-CR terminal keyboard.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- 5.1.3 Run MAD-CR program following user prompts and entering appropriate data from Step 5.1.1.
- 5.1.4 When prompted, display the Incident Report Form and log the results.
- a. Event Classification: _____
- b. PARS: _____
- 5.1.5 Compare the results of Step 5.1.4 against the current classification and PARS. **IF** the results of this assessment are an escalation of classification and/or PARS, **THEN** go to EPIP 1.1, Step 5.5, **OR** else exit this procedure.

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

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

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

- 5.2.1 **IF** MAD-CR
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/or
WEDAP,
AND go to EPIP 1.1, Step 5.5,
AND Step 5.3 of this procedure, performing both simultaneously.

5.2.2 Verify RMS-SS is available:

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

OR

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

5.2.3 Estimate Release Rate Using Data From RMS-SS

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

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

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

TABLE 1
RELEASE MONITORS ALARMING

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

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

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TABLE 2
RELEASE RATE CALCULATIONS

NOTE: Conversion factors assume nominal flow rates.

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

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NOTE: IF PPCS is out of service, THEN obtain $\sigma\theta$ and lapse rate readings from the Control Room indications, AND THEN reference Table 5 to determine stability class.

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

- a. Obtain the wind speed and stability class from PPCS indication (Page 351 of PPCS). Record wind speed in Step 5.2.6.c equation.
- b. Select the appropriate Xu/Q factor value from the table below based upon the stability class. Record the X/Q factor value in Step 5.2.6.c equation.

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

c. Calculate the dispersion factor:

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

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

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

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

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

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

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

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

OR

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

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

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

OR

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

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

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

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

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

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5.2.14 Determine Protective Action Recommendations

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°.

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

INTEGRATED PROJECTED DOSE	PROTECTIVE ACTION	MILES	SECTORS
<1 rem TEDE <u>AND</u> <5 rem CDE	None Required	N/A	N/A
≥1 rem TEDE <u>OR</u> ≥5 rem CDE	Evacuate Evacuate	0-2 miles 2-5 miles	All (360°) Downwind Sectors

- b. Select downwind sectors using Attachment A.

5.2.15 Compare the results against the current classification and PARS. **IF** the results of this assessment is an escalation of classification and/or PARS, **THEN** go to EPIP 1.1, Step 5.5, **OR** else exit this procedure.

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

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5.3 Offsite Field Measurements

5.3.1 Check if Plume Impacts Terrestrial Areas

a. Wind Direction $> 305^\circ$

OR

b. Wind Direction $< 210^\circ$

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

Maximum measured gamma dose rate: _____ R/hr

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

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

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

OR

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

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

5.3.6 Compare the results of your assessment against the current classification and PARS.

IF the results of this assessment is an escalation of classification and/or PARS,

THEN go to EPIP 1.1, Step 5.5,

OR else exit this procedure.

Performed By:

Performer (Print and Sign) Date / Time

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5.4 Wisconsin Electric Dose Assessment Program (WEDAP)

5.4.1 Verify WEDAP dose projection program available.

5.4.2 Individual Dose Assessment Based Upon Given Set Of Conditions

a. Case Data Screen Inputs

- Title of Case
- Verify time of case, meteorological data, shutdown, and release start times
- Release End Time (four hours default if unknown)
- Meteorological Data

(a) Stability Class from PPCS

- (1) IF stability class NOT available,
THEN value of sigma theta (>3 mph wind speeds).
- (2) IF lapse rate is appropriate to use for determining
stability class (<3 mph wind speeds),
THEN value of lapse rate.

(b) Lake breeze, if applicable

(c) Wind speed and direction

- Select "ON" if building wake effect used for case
- Select data source "Actual" if RMS or field monitoring team data will be used for dose projection
- Select source term ("case basis")
 - (a) Plant conditions
 - (b) Gross release
 - (c) Offsite measurements

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b. Plant Conditions Screen Inputs

- Select Accident Type
 - (a) LOCA/GAP - Plant Conditions
 - (b) SGTR
 - (c) Containment Bypass
 - (d) LOCA - High Range Monitor
 - (e) Spent Fuel Handling Accident
- Select source term characteristics
- Select release path characteristics
- "OK" to return to "Case Data" screen displaying updated data

c. Gross Release Input Screen Inputs

- Using RMS Data
 - (a) Select the alarming RMS monitor(s) and adjust monitor (stack release rate) conversion factors if accident flow is **NOT** standard flow for the release path.
 - (b) Enter RMS reading value.
 - (c) Gross release rate will be calculated in Ci/sec.
- Type of Accident
 - (a) LOCA/GAP inside containment
 - (b) SGTR
 - (c) LOCA outside of containment (bypass of containment - Event V)
 - (d) Fuel Handling
- Select source term characteristics
- Select release path characteristics
- "OK" to return to "Case Data" screen displaying updated data

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d. Offsite Measurement Inputs

- Survey reading or isotopic (air sample results)
- Measurement distance in tenths of mile from plant
- Measurement location in degrees downwind
- Select radiac survey instrument readings or isotopic data:
 - (a) Radiac survey instrument readings are in mrem/hr and must re-select accident types.
 - (b) Isotopic data by selecting nuclides from list and entering values from sample result form(s).
- "OK" to return to "Case Data" screen displaying updated data

e. Dose Calculation Inputs

- Verify estimated release duration (four-hour default if unknown)
- Select "Calculate"
- Projection results displayed:
 - (a) Whole body dose (TEDE)
 - (b) Thyroid dose rate (CDE)
 - (c) Protective Action Recommendations
 - (d) Classification information (must select "Display Dose Rates")
 - (e) KI issue for emergency workers (must select "Display Dose Rates")

f. Adding a new case to existing file

- Select "Add Case"
- Enter new case time and date, as needed
- Adjust meteorology and release source information as needed

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- g. Print case to local printer
- h. Save existing case file to disk
- i. Optional features
 - Calculate Population
 - View Trends
 - View Nuclide Physical Data
 - View Dose Conversion Factor Data

5.4.3 Compare the results of Step 5.4.2.e calculations 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.

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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 Duty Shift Superintendent to estimate the release rate.

- 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.
- Multiply the reading by the conversion factor and entering the result in the "Release Rate" column on Section A of Worksheet 1.
- 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 Duty Shift Superintendent.

- 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.
- 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).

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- 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.

Vent Pathway	ACCIDENT TYPE					
	LOCA ⁽¹⁾	Gap Accident ⁽⁴⁾		FHA ⁽¹⁾	Steam Generator Tube Rupture ⁽²⁾	
		0-12 hours	> 12 hours		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

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WORKSHEET 1
RELEASE RATE CALCULATIONS
Page 1 of 3

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

<u>Monitor</u>	<u>Reading</u> ($\mu\text{Ci/cc}$)	<u>Conversion</u> <u>Factor</u> ($\text{cc-Ci/s-}\mu\text{Ci}$)	<u>Release Rate</u> (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	_____

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

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

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

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WORKSHEET 1
RELEASE RATE CALCULATIONS
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C. ACTUAL VERSUS CONVERSION CURVE FLOW RATE RATIO

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

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

D. ESTIMATE OF GROSS RELEASE RATE

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

<u>Vent</u>	<u>Release Rate</u> <u>(curies/s)</u>
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.

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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.

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

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

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

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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, $\Delta T/\Delta H$, °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
_____	_____	_____	_____	_____

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

12. Centerline X/Q:

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

Completed By: _____ Date/Time _____ / _____

Route to Dose/PAR Coordinator upon completion.

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

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

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

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

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

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

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

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

TABLE 5
BACKUP DETERMINATION OF ATMOSPHERIC STABILITY CLASS

Surface Wind Speed (U mph @ 50 meter height)	DAY			NIGHT	
	Incoming Solar Radiation			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 X_u/Q VALUES VERSUS DISTANCE FROM THE SITE

(Units are m^{-2})

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

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

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

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

Example:

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

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

Enter the X/Q values on Worksheet 2.

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

5.5.3 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.

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

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

where:

$\text{Dose}_{i, \text{ whole body}}$ = 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 , $\text{rem}\cdot\text{m}^3/\text{Ci}\cdot\text{hr}$;

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.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

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

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

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

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

where:

$\text{Dose}_{i, \text{thyroid}}$ = 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, $\text{rem}\cdot\text{m}^3/\text{Ci}\cdot\text{hr}$;

ERD = estimated duration of the release, hours.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

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

5.5.5 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.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

WORKSHEET 5
ESTIMATED GROUND DEPOSITION

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

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

Calculate the projected ground deposition using the equation: SECTOR _____;
DISTANCE _____ miles

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

TIME _____

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

Nuclide	Q	F _i	X/Q	Vel _i	ERD	Dep _i
I-131	_____	_____	_____	0.01	_____	_____
I-132	_____	_____	_____	0.01	_____	_____
I-133	_____	_____	_____	0.01	_____	_____
I-134	_____	_____	_____	0.01	_____	_____
I-135	_____	_____	_____	0.01	_____	_____
Rb-88	_____	_____	_____	0.001	_____	_____
Cs-138	_____	_____	_____	0.001	_____	_____

Total Dose _____

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

Completed By: _____ Date/Time _____ / _____

Route to Dose/PAR Coordinator upon completion.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

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

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

where:

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

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

5.5.1 Population Exposure (Worksheet 6)

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

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

- 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.

5.5.2 Determine Protective Action Recommendations by evaluating the calculation results with the values in the "Integrated Projected Dose" column below, selecting downwind sectors using Attachment A.

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

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

5.5.4 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:	
_____	_____/_____/_____ Date / Time
Performer (Print and Sign)	

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

WORKSHEET 6
ESTIMATED POPULATION DOSE

Complete this form using the calculation from Worksheet 3.

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

Calculated Population Dose

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

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

Population Figures
(By Sector and Distance)

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

NOTE: All other sectors have zero population.

Completed By: _____ Date/Time _____ / _____

Route to Dose/PAR Coordinator upon completion.

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
LOCA SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY NOT USED
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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	<u>2.75E-02</u>	3.40E-02	<u>6.07E-02</u>	4.82E-02	5.43E-02	0.001	0.044	0.071	0.116	0.084	0.057
1.0	<u>3.08E-02</u>	3.25E-02	<u>6.70E-02</u>	3.61E-02	5.79E-02	0.001	0.046	0.061	0.115	0.113	0.053
1.5	<u>3.40E-02</u>	3.09E-02	<u>7.27E-02</u>	2.69E-02	6.08E-02	0.001	0.047	0.051	0.112	0.120	0.037
2.0	<u>3.69E-02</u>	2.88E-02	<u>7.80E-02</u>	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	<u>4.20E-02</u>	2.42E-02	<u>8.58E-02</u>	1.01E-02	6.43E-02	0.001	0.046	0.028	0.097	0.108	0.008
4.0	<u>4.63E-02</u>	1.97E-02	<u>9.19E-02</u>	4.99E-03	6.42E-02	0.001	0.043	0.018	0.083	0.093	0.003
5.0	<u>5.00E-02</u>	1.57E-02	<u>9.64E-02</u>	2.44E-03	6.27E-02	0.002	0.040	0.011	0.070	0.079	0.001
6.0	<u>5.33E-02</u>	1.24E-02	<u>9.97E-02</u>	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	<u>5.90E-02</u>	7.47E-03	<u>1.03E-01</u>	2.64E-04	5.49E-02	0.002	0.030	0.003	0.040	0.045	0.000
9.0	<u>6.13E-02</u>	5.73E-03	<u>1.05E-01</u>	1.24E-04	5.16E-02	0.002	0.027	0.002	0.033	0.036	0.000
10.0	<u>6.35E-02</u>	4.39E-03	<u>1.05E-01</u>	5.80E-05	4.84E-02	0.002	0.024	0.001	0.026	0.030	0.000
12.0	<u>6.74E-02</u>	2.54E-03	<u>1.04E-01</u>	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	<u>8.19E-02</u>	8.11E-05	<u>8.82E-02</u>	1.08E-09	1.53E-02	0.003	0.004	0.000	0.001	0.001	0.000
30.0	<u>8.65E-02</u>	1.39E-05	<u>7.76E-02</u>	0.000	8.88E-03	0.003	0.001	0.000	0.000	0.000	0.000
36.0	<u>9.02E-02</u>	2.36E-06	<u>6.73E-02</u>	0.000	5.08E-03	0.003	0.001	0.000	0.000	0.000	0.000
42.0	<u>9.34E-02</u>	3.96E-07	<u>5.81E-02</u>	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	<u>1.04E-01</u>	0.000	2.58E-02	0.000	1.59E-04	0.004	0.000	0.000	0.000	0.000	0.000
96.0	<u>1.10E-01</u>	0.000	1.31E-02	0.000	1.51E-05	0.005	0.000	0.000	0.000	0.000	0.000
120.0	<u>1.15E-01</u>	0.000	6.58E-03	0.000	1.43E-06	0.005	0.000	0.000	0.000	0.000	0.000
144.0	<u>1.20E-01</u>	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	<u>1.63E-01</u>	0.000	1.28E-05	0.000	0.000	0.017	0.000	0.000	0.000	0.000	0.000
504.0	<u>2.06E-01</u>	0.000	9.49E-08	0.000	0.000	0.039	0.000	0.000	0.000	0.000	0.000
672.0	<u>2.49E-01</u>	0.000	0.000	0.000	0.000	0.086	0.000	0.000	0.000	0.000	0.000
720.0	<u>2.60E-01</u>	0.000	0.000	0.000	0.000	0.106	0.000	0.000	0.000	0.000	0.000

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

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
LOCA SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY USED
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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	<u>3.55E-06</u>	<u>7.82E-06</u>	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	<u>3.97E-06</u>	<u>8.64E-06</u>	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	<u>4.39E-06</u>	<u>9.38E-06</u>	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	<u>4.77E-06</u>	<u>1.01E-05</u>	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	<u>5.43E-06</u>	<u>1.11E-05</u>	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	<u>5.99E-06</u>	<u>1.19E-05</u>	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	<u>6.47E-06</u>	<u>1.25E-05</u>	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	<u>6.89E-06</u>	<u>1.29E-05</u>	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	<u>7.61E-06</u>	<u>1.34E-05</u>	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	<u>7.90E-06</u>	<u>1.35E-05</u>	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	<u>8.16E-06</u>	<u>1.34E-05</u>	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	<u>8.60E-06</u>	<u>1.33E-05</u>	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	<u>1.01E-05</u>	<u>1.08E-05</u>	7.60E-07	1.37E-03	8.81E-01	8.41E-02	5.88E-03	0.00	1.53E-03	0.00
30.0	<u>1.05E-05</u>	<u>9.38E-06</u>	3.05E-08	3.31E-04	9.10E-01	6.22E-02	3.35E-03	0.00	3.70E-04	0.00
36.0	<u>1.08E-05</u>	<u>8.04E-06</u>	0.00	7.89E-05	9.30E-01	4.45E-02	1.90E-03	0.00	8.81E-05	0.00
42.0	<u>1.10E-05</u>	<u>6.87E-06</u>	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	<u>1.20E-05</u>	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	<u>1.25E-05</u>	1.49E-06	0.00	0.00	9.80E-01	8.84E-04	5.38E-06	0.00	0.00	0.00
120.0	<u>1.31E-05</u>	7.49E-07	0.00	0.00	9.82E-01	1.67E-04	5.08E-07	0.00	0.00	0.00
144.0	<u>1.37E-05</u>	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	<u>1.95E-05</u>	0.00	0.00	0.00	9.75E-01	0.00	0.00	0.00	0.00	0.00
504.0	<u>2.59E-05</u>	0.00	0.00	0.00	9.46E-01	0.00	0.00	0.00	0.00	0.00
672.0	<u>3.32E-05</u>	0.00	0.00	0.00	8.78E-01	0.00	0.00	0.00	0.00	0.00
720.0	<u>3.51E-05</u>	0.00	0.00	0.00	8.48E-01	0.00	0.00	0.00	0.00	0.00

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

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

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

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

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

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

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

Time	I-131	I-133	Kr-87	Kr-88	Xe-133	Xe-135	Xe-138	Rb-88	Cs-138
0.0	6.38E-08	1.43E-07	1.08E-01	1.52E-01	2.86E-01	6.06E-02	2.51E-01	0.00	0.00
0.5	<u>7.22E-08</u>	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	<u>1.77E-07</u>	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	<u>9.87E-08</u>	<u>2.08E-07</u>	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	<u>1.13E-07</u>	<u>2.32E-07</u>	3.78E-02	1.30E-01	5.05E-01	9.04E-02	3.65E-04	1.45E-01	1.08E-02
4.0	<u>1.26E-07</u>	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	<u>1.37E-07</u>	<u>2.63E-07</u>	1.55E-02	9.64E-02	6.08E-01	9.48E-02	3.84E-06	1.08E-01	1.03E-03
6.0	<u>1.47E-07</u>	<u>2.75E-07</u>	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	<u>1.64E-07</u>	<u>2.87E-07</u>	3.62E-03	5.54E-02	7.21E-01	9.16E-02	0.00	6.19E-02	2.59E-05
9.0	<u>1.70E-07</u>	<u>2.89E-07</u>	2.19E-03	4.50E-02	7.51E-01	8.87E-02	0.00	5.04E-02	7.45E-06
10.0	<u>1.76E-07</u>	<u>2.91E-07</u>	1.32E-03	3.66E-02	7.76E-01	8.54E-02	0.00	4.10E-02	2.12E-06
12.0	<u>1.86E-07</u>	<u>2.89E-07</u>	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	<u>2.16E-07</u>	<u>2.32E-07</u>	0.00	1.47E-03	9.24E-01	3.85E-02	0.00	1.64E-03	0.00
30.0	<u>2.22E-07</u>	<u>1.98E-07</u>	0.00	3.50E-04	9.42E-01	2.58E-02	0.00	3.92E-04	0.00
36.0	<u>2.27E-07</u>	<u>1.69E-07</u>	0.00	8.29E-05	9.52E-01	1.71E-02	0.00	9.26E-05	0.00
42.0	<u>2.31E-07</u>	<u>1.43E-07</u>	0.00	1.95E-05	9.59E-01	1.14E-02	0.00	2.18E-05	0.00
48.0	<u>2.34E-07</u>	1.21E-07	0.00	4.58E-06	9.63E-01	7.50E-03	0.00	5.13E-06	0.00
72.0	<u>2.46E-07</u>	6.11E-08	0.00	0.00	9.70E-01	1.40E-03	0.00	0.00	0.00
96.0	<u>2.57E-07</u>	3.08E-08	0.00	0.00	9.71E-01	2.60E-04	0.00	0.00	0.00
120.0	<u>2.69E-07</u>	1.54E-08	0.00	0.00	9.71E-01	4.82E-05	0.00	0.00	0.00
144.0	<u>2.81E-07</u>	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	<u>3.90E-07</u>	0.00	0.00	0.00	9.37E-01	0.00	0.00	0.00	0.00
504.0	<u>4.93E-07</u>	0.00	0.00	0.00	8.58E-01	0.00	0.00	0.00	0.00
672.0	<u>5.60E-07</u>	0.00	0.00	0.00	7.08E-01	0.00	0.00	0.00	0.00
720.0	<u>5.65E-07</u>	0.00	0.00	0.00	6.52E-01	0.00	0.00	0.00	0.00

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

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
FUEL HANDLING ACCIDENT SOURCE TERM ACTIVITY FRACTIONS - CONTAINMENT SPRAY NOT USED
Page 5 of 8

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

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

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

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

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

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

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

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

Time	I-131	I-133	I-135	Kr-85	Kr-85m	Kr-88	Xe-133	Xe-135	Xe-138	Rb-88	Cs-138
0.0	3.92E-08	3.05E-08	3.16E-08	0.933	0.030	0.008	0.011	4.03E-03	0.013	0.000	0.000
0.5	<u>3.93E-08</u>	<u>3.00E-08</u>	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	<u>3.95E-08</u>	<u>2.94E-08</u>	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	<u>3.96E-08</u>	<u>2.90E-08</u>	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	<u>3.97E-08</u>	<u>2.81E-08</u>	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	<u>3.99E-08</u>	<u>2.74E-08</u>	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	<u>3.99E-08</u>	<u>2.66E-08</u>	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	<u>3.98E-08</u>	<u>2.58E-08</u>	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	<u>3.98E-08</u>	<u>2.42E-08</u>	1.44E-08	0.976	0.009	0.001	0.011	2.30E-03	0.00	1.23E-03	0.00
9.0	<u>3.97E-08</u>	<u>2.35E-08</u>	1.30E-08	0.978	0.008	0.001	0.010	2.14E-03	0.00	9.61E-04	0.00
10.0	<u>3.96E-08</u>	<u>2.27E-08</u>	1.18E-08	0.979	0.007	0.001	0.010	1.98E-03	0.00	7.53E-04	0.00
12.0	<u>3.95E-08</u>	<u>2.13E-08</u>	9.57E-09	0.982	0.005	0.00	0.010	1.71E-03	0.00	4.60E-04	0.00
18.0	<u>3.89E-08</u>	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	<u>3.81E-08</u>	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	<u>3.73E-08</u>	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	<u>3.65E-08</u>	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	<u>3.58E-08</u>	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	<u>3.51E-08</u>	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	<u>3.22E-08</u>	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	<u>2.95E-08</u>	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	<u>2.71E-08</u>	5.40E-10	0.00	0.994	0.00	0.00	5.83E-03	0.00	0.00	0.00	0.00
144.0	<u>2.49E-08</u>	2.38E-10	0.00	0.995	0.00	0.00	5.11E-03	0.00	0.00	0.00	0.00
168.0	<u>2.28E-08</u>	1.05E-10	0.00	0.996	0.00	0.00	4.48E-03	0.00	0.00	0.00	0.00
336.0	<u>1.26E-08</u>	3.40E-13	0.00	0.998	0.00	0.00	1.79E-03	0.00	0.00	0.00	0.00
504.0	<u>6.87E-09</u>	0.00	0.00	0.999	0.00	0.00	7.09E-04	0.00	0.00	0.00	0.00
672.0	<u>3.80E-09</u>	0.00	0.00	1.000	0.00	0.00	2.84E-04	0.00	0.00	0.00	0.00
720.0	<u>3.19E-09</u>	0.00	0.00	1.000	0.00	0.00	2.18E-04	0.00	0.00	0.00	0.00

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

DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

TABLE 7
STEAM GENERATOR TUBE RUPTURE SOURCE TERM - - RELEASE MODE - NOT THROUGH THE CONDENSER - ACTIVITY FRACTIONS
Page 8 of 8

Time	I-131	I-133	I-135	Kr-85	Kr-85m	Kr-88	Xe-133	Xe-135	Xe-138	Rb-88	Cs-138
0.0	<u>3.92E-04</u>	<u>3.05E-04</u>	3.16E-04	0.933	0.030	0.008	0.011	4.03E-03	0.013	0.00	0.00
0.5	<u>3.93E-04</u>	<u>3.00E-04</u>	3.01E-04	0.937	0.028	0.007	0.011	3.90E-03	0.004	4.89E-03	3.43E-03
1.0	<u>3.94E-04</u>	<u>2.98E-04</u>	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	<u>3.95E-04</u>	<u>2.94E-04</u>	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	<u>3.96E-04</u>	<u>2.90E-04</u>	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	<u>3.98E-04</u>	<u>2.86E-04</u>	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	<u>3.97E-04</u>	<u>2.81E-04</u>	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	<u>3.99E-04</u>	<u>2.74E-04</u>	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	<u>3.99E-04</u>	<u>2.66E-04</u>	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	<u>3.98E-04</u>	<u>2.58E-04</u>	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	<u>3.99E-04</u>	<u>2.50E-04</u>	1.59E-04	0.973	0.011	0.001	0.011	2.47E-03	0.00	1.57E-03	1.94E-06
8.0	<u>3.98E-04</u>	<u>2.42E-04</u>	1.44E-04	0.976	0.009	0.001	0.011	2.30E-03	0.00	1.23E-03	0.00
9.0	<u>3.97E-04</u>	<u>2.35E-04</u>	1.30E-04	0.978	0.008	0.001	0.010	2.14E-03	0.00	9.60E-04	0.00
10.0	<u>3.96E-04</u>	<u>2.27E-04</u>	1.18E-04	0.979	0.007	0.001	0.010	1.98E-03	0.00	7.52E-04	0.00
12.0	<u>3.95E-04</u>	<u>2.13E-04</u>	9.57E-05	0.982	0.005	0.00	0.010	1.71E-03	0.00	4.59E-04	0.00
18.0	<u>3.89E-04</u>	<u>1.74E-04</u>	5.16E-05	0.987	0.002	0.00	0.010	1.09E-03	0.00	1.04E-04	0.00
24.0	<u>3.81E-04</u>	<u>1.42E-04</u>	2.77E-05	0.989	0.001	0.00	9.80E-03	6.92E-04	0.00	2.37E-05	0.00
30.0	<u>3.73E-04</u>	<u>1.16E-04</u>	1.49E-05	0.990	0.00	0.00	9.48E-03	4.39E-04	0.00	5.38E-06	0.00
36.0	<u>3.65E-04</u>	<u>9.48E-05</u>	8.00E-06	0.990	0.00	0.00	9.24E-03	2.79E-04	0.00	1.22E-06	0.00
42.0	<u>3.58E-04</u>	<u>7.72E-05</u>	4.29E-06	0.991	0.00	0.00	8.91E-03	1.77E-04	0.00	0.00	0.00
48.0	<u>3.51E-04</u>	<u>6.29E-05</u>	2.31E-06	0.991	0.00	0.00	8.66E-03	1.12E-04	0.00	0.00	0.00
72.0	<u>3.22E-04</u>	<u>2.78E-05</u>	0.00	0.992	0.00	0.00	7.57E-03	1.83E-05	0.00	0.00	0.00
96.0	<u>2.95E-04</u>	<u>1.23E-05</u>	0.00	0.993	0.00	0.00	6.64E-03	2.96E-06	0.00	0.00	0.00
120.0	<u>2.71E-04</u>	<u>5.40E-06</u>	0.00	0.994	0.00	0.00	5.83E-03	0.00	0.00	0.00	0.00
144.0	<u>2.49E-04</u>	<u>2.38E-06</u>	0.00	0.995	0.00	0.00	5.11E-03	0.00	0.00	0.00	0.00
168.0	<u>2.28E-04</u>	<u>1.05E-06</u>	0.00	0.996	0.00	0.00	4.48E-03	0.00	0.00	0.00	0.00
336.0	<u>1.26E-04</u>	<u>3.40E-09</u>	0.00	0.998	0.00	0.00	1.79E-03	0.00	0.00	0.00	0.00
504.0	<u>6.87E-05</u>	0.00	0.00	0.999	0.00	0.00	7.09E-04	0.00	0.00	0.00	0.00
672.0	<u>3.80E-05</u>	0.00	0.00	1.000	0.00	0.00	2.84E-04	0.00	0.00	0.00	0.00
720.0	<u>3.19E-05</u>	0.00	0.00	1.000	0.00	0.00	2.18E-04	0.00	0.00	0.00	0.00

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

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

6.0 REFERENCES

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

7.0 BASES

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

ATTACHMENT A
 AFFECTED SECTORS BASED ON WIND DIRECTION

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

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

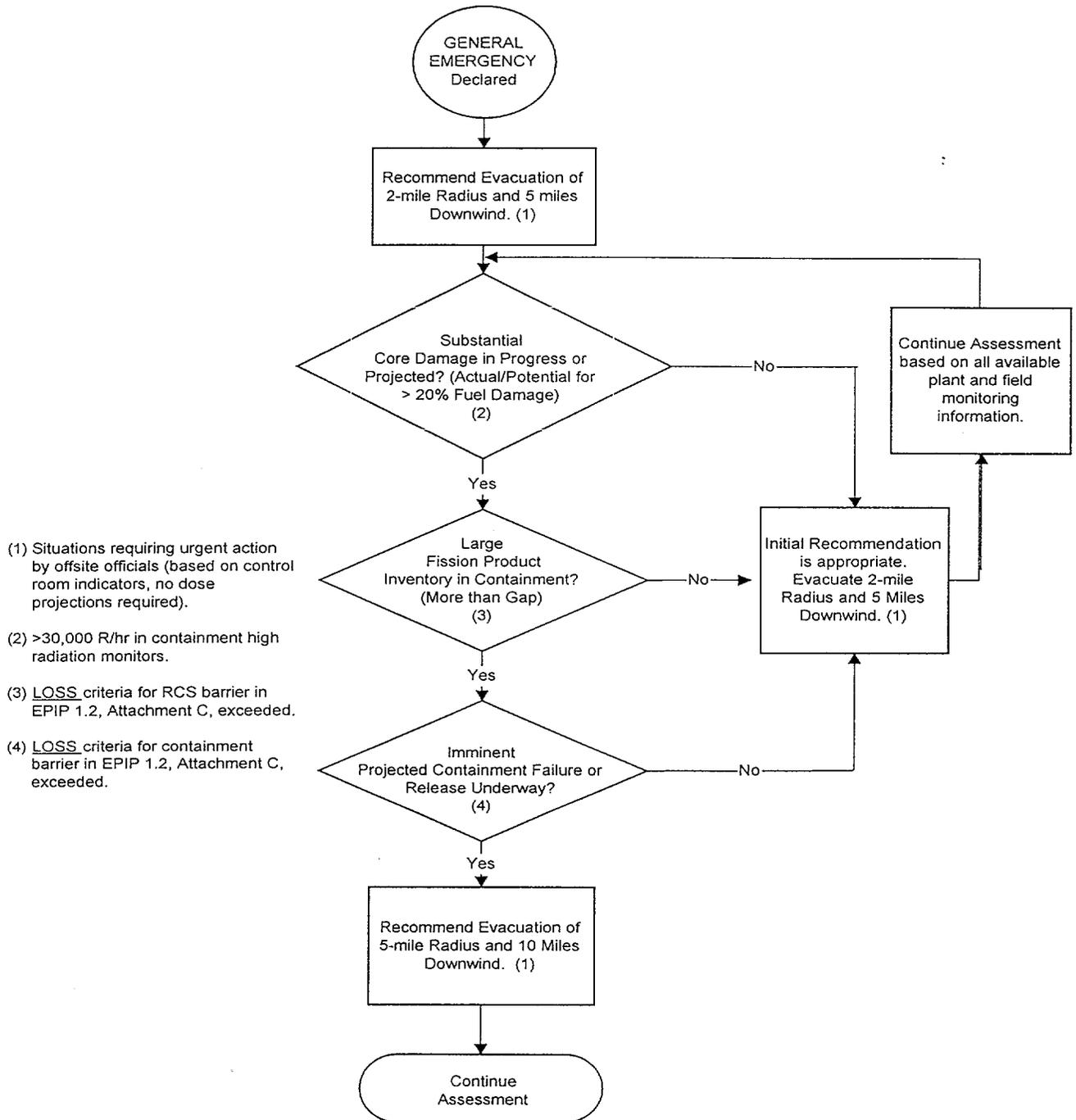
* As read on PPCS or control room instruments.

** As read on chart recorder.

() Denotes sectors over Lake Michigan.

DOSE ASSESSMENT AND PROTECTIVE ACTION
RECOMMENDATIONS

ATTACHMENT B
GENERAL EMERGENCY OFFSITE PROTECTIVE ACTIONS



EPIP 2.1

NOTIFICATIONS - ERO, STATE & COUNTIES, AND NRC



*Wisconsin
Electric
Power Company*

DOCUMENT TYPE: Technical

CLASSIFICATION: NNSR

REVISION: 19

EFFECTIVE DATE: February 18, 2000

APPROVAL AUTHORITY: Department Manager

PROCEDURE OWNER (title): Group Head

OWNER GROUP: Emergency Preparedness

NAMES AND
TELEPHONE NUMBERS
DELETED

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1.0 PURPOSE

This procedure is to provide guidance for making initial and subsequent notifications of a classified emergency to members of the Point Beach Nuclear Plant Emergency Response Organization (ERO), State of Wisconsin, Manitowoc County, Kewaunee County, and the Nuclear Regulatory Commission.

2.0 PREREQUISITES

2.1 Responsibilities

2.1.1 Duty Shift Superintendent (DSS) has the ultimate responsibility to complete notifications per this procedure until a formal turnover to the Emergency Director has been conducted.

2.1.2 **IF** available to assist with this procedure,
THEN the DSS may assign these tasks to:

- Security Shift Commander
- Operating Supervisor(s)
- Shift Technical Advisor

2.1.3 State and County Communicator shall assume notifications to the State and Counties upon activation of the Emergency Operations Facility (EOF).

2.1.4 ENS Communicator shall assume notifications to the NRC upon activation of the Technical Support Center (TSC).

2.2 Equipment

2.2.1 Notification of the Emergency Response Organization

- Point Beach Automated Notification System (accessed via telephone)
- Corporate alpha-numeric paging system (accessed via TSO)
- Corporate alpha-numeric paging system (accessed via telephone)

2.2.2 Notification of the State and County Emergency Managements

- Two-Digit Dial Select Telephone
- Commercial Telephones (PBX, GTE, Microwave)

2.2.3 Notification of the NRC

- FTS-2000 Emergency Notification System (ENS)
- Commercial Telephones (PBX, GTE, Microwave)

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Completion of this procedure shall not prevent the operators from bringing the plant to a safe condition to protect the health and safety of the general public.
- 3.2 The State of Wisconsin Emergency Management, Manitowoc County Emergency Management, and Kewaunee County Emergency Government shall be notified **within 15-minutes of event classification**.
- 3.3 The NRC shall be notified **immediately following the state and county notifications, not to exceed one hour from declaration** of a classified emergency.
- 3.4 TSO knowledge is required for IBM mainframe access to the paging system.
- 3.5 Only pre-designated personnel may activate the Point Beach Automated Notification System, using their scenario activation password.

4.0 INITIAL CONDITIONS

- 4.1 An emergency has been declared or terminated.
- 4.2 A change from one emergency classification to another has occurred.
- 4.3 Further degradation of the level of safety of the plant, major changes in equipment or reactor status, or other major changes **NOT** involving a change in emergency classification have occurred.

5.0 PROCEDURE

NOTE: The notifications of the Emergency Response Organization, State and Counties, Other Pertinent Agencies, and Nuclear Regulatory Commission should be completed simultaneously if possible.

5.1 Notification of Emergency Response Organization (ERO)

NOTE: Complete Step 5.1.2, Step 5.1.3, or Step 5.1.4, respectively, if the Point Beach Automated Notification System is unavailable.

5.1.1 PBNP Automated Notification System

- a. Determine the information desired to be sent to the Emergency Response Organization using Attachment A. Record the information at the bottom of Attachment A.
- b. From any on-site telephone, dial _____ to access the PBNP Automated Notification System and follow the voice prompt instructions.
- c. When prompted, enter the scenario activation password " _____ " using the keypad on the telephone.
- d. When prompted, enter the 3-digit SCENARIO number from Attachment A.
- e. When the PBNP Automated Notification System says, "The scenario is building," press the "#" key, listen to "good-bye," and then hang up. Other menu options are available at this point (i.e., cancel scenario).

NOTE: IF the ERO pager(s) in the Control Room do not activate and display the message within 3-4 minutes, THEN go to Step 5.1.2 to send the page.

- f. Monitor the Emergency Response Organization (ERO) pager(s) in the Control Room for verification of activation.

NOTIFICATIONS - ERO, STATE & COUNTIES, AND NRC

- g. Periodic fax printouts will automatically be sent to the Control Room, Technical Support Center, and Emergency Operations Facility to show who is responding and their estimated time of arrival.
- h. If the pager activation was successful, skip Steps 5.1.2 through 5.1.4 and return this procedure section and completed Attachment A to Emergency Preparedness or include in the TSC Manager turnover package.

Performed By:

_____	/
Performer (Print and Sign)	Date / Time

5.1.2 Alpha-Numeric Paging Accessed Via Telephone

NOTE 1: Enter pager number to do a PBNP All-Call page of the ERO.

NOTE 2: Enter the 4 digit pager number to page a specific individual.
(Ref. Emergency Telephone Directory)

NOTE 3: You must enter the asterisks and two digit code to have the message sent to the pagers (i.e., "**" would display "PBNP UE, No Action Needed" or "**1" would display "Call Immediately").

a. Determine the pager message required:

- Use the following preprogrammed codes to provide event declarations.

**	= PBNP UE, No Action Needed
**	= PBNP ALERT. Report, Normal Route
**	= PBNP ALERT. Report, From South
**	= PBNP ALERT. Report, From North
**	= PBNP SE. Report, Normal Route
**	= PBNP SE. Report, From South
**	= PBNP SE. Report, From North
**	= PBNP GE. Report, Normal Route
**	= PBNP GE. Report, From South
**	= PBNP GE. Report, From North

- Use the following preprogrammed codes to provide other information, with a call back number, if appropriate:

**	= Drill UE. No Action Needed
**	= Drill. AL/SE/GE. Report
**	= Call Immediately
**	= Urgent Call
**	= Call when Available
**	= Please Call the Office
**	= Phone Home

5.1.3 Alpha-Numeric Paging Accessed Via IBM Mainframe (TSO)

NOTE: You must have TSO access to page via the IBM Mainframe system. If you do not have TSO access, notify DSS to re-assign to an individual with TSO access.

- a. Access the mainframe MULTSESS menu from a computer.
- b. After selecting the TSO application and receiving the READY text, type in "PAGE" and the enter key.

NOTE 1: Do not use symbols.

NOTE 2: Enter pager number to do a PBNP All-Call page of the ERO.

NOTE 3: To page an individual, hit the enter key and select the name from the list of pager users displayed using a last name search.

- c. A paging screen will appear asking you for an alpha-numeric message and the pager number you want to reach. Type the message per the event classification and any activation needs of the Emergency Response Facilities.
- d. Tab to the pager number blank and enter the pager or group number.
- e. Press ENTER to have your message sent.
- f. After a slight delay, a message comes up showing that your message was sent and who was paged.
- g. This completes the page. You can continue with another page or press PF3 as needed to return to the READY prompt. Type CESF and the enter key to log off TSO at this point.

NOTE: IF the ERO pager(s) in the Control Room do not activate and display the message within 3-4 minutes, THEN go to Step 5.1.4 to send the page.

- h. Monitor the ERO pager(s) in the control room for verification of activation.
- i. If the pager activation was successful, skip Step 5.1.4 and return this procedure section to Emergency Preparedness or include in the TSC Manager turnover package.

Performed By:

_____ / _____
Performer (Print and Sign) Date / Time

5.1.4 Manual Call Tree (reference Emergency Telephone Directory)

NOTE 1: Use this process if all automated methods of notifying the ERO fail.

NOTE 2: IF unable to contact any of the following personnel, THEN assign that section to onsite individual.

a. Contact two people from the Emergency Preparedness staff (ref. Step 5.1.4.(a)-(b)) and the On-Call Management (ref Step 5.1.4.(c)-(g)), instructing them to:

- Notify qualified ERO personnel for each position listed (ref ETD 01), determine FFD, fill the "*" minimum positions first, and staff each position to the (#) level indicated.
 - (a) FFD #1 - "Are you able to respond?"
 - (b) FFD #2 - If yes, "Have you consumed alcohol in the last five hours?"
 - (c) FFD #3 - If no, instruct person to report immediately to emergency response facility and fill the position of _____.
- Contact you with periodic status updates.
- Report to their emergency response facility upon completion of the notifications.

(a) EP Staff #1 _____ (Name)

- (1) *TSC Manager (1)
- (2) *TSC/EOF Communicator (1)
- (3) *EOF/CR Communicator (1)
- (4) *Engineering Coordinator (1)
- (5) *Operations Coordinator (1)
- (6) *OSC Coordinator (1)
- (7) *ENS Communicator (1)
- (8) *Rad/Chem Coordinator (1)
- (9) Security Coordinator (1)
- (10) Plant Status Monitor-TSC (1)
- (11) Administrative Support Leader-TSC (1)
- (12) Rad/Chem Monitor (1)
- (13) Reactor/Core Physics Engineer (1)
- (14) PRA Engineer (1)
- (15) Mechanical Systems Engineer (1)
- (16) Electrical/I&C Engineer (1)
- (17) WE Executive Spokesperson (1)

NOTIFICATIONS - ERO, STATE & COUNTIES, AND NRC

(b) EP Staff #2 _____ (Name)

- (1) *Emergency Director (1)
- (2) *EOF Manager (1)
- (3) *TSC/CR Communicator (1)
- (4) *Dose/PAR Coordinator (1)
- (5) *State/Counties Communicator (1)
- (6) *JPIC Communicator (1)
- (7) *Resource Coordinator (1)
- (8) Plant Status Monitor-EOF (1)
- (9) Dose/PAR Monitor (1)
- (10) HPN/SRC Communicator (1)
- (11) State Liaison (1)
- (12) Offsite Assembly Area Coordinator (1)
- (13) Corporate Communicator (1)
- (14) Administrative Support Leader-EOF (1)
- (15) Kewaunee County Liaison (1)
- (16) Manitowoc County Liaison (1)
- (17) EOF Communicator at JPIC (1)
- (18) JPIC Technical Advisor (1)
- (19) JPIC Technical Spokesperson (1)

(c) Operations _____ (Name)

- (1) *DSS (Reentry Team Coordinator) from "off" crews (1)
- (2) *Operating Supervisor (Operations Leader) from "off" crews (2)
- (3) CO Reentry from "off" crews (4)
- (4) AO Reentry from "off" crews (4)

(d) Radiation Protection _____ (Name)

- (1) *Offsite Radiation Protection Coordinator (1)
- (2) *Radiation Protection Leader (1)
- (3) *Field Team Leader (1)
- (4) *Offsite RP Reentry (6)
- (5) Onsite RP Reentry (4)

(e) Maintenance Supervisor _____ (Name)

- (1) Mechanical Leader (1)
- (2) Electrical Leader (1)
- (3) Mechanical Reentry (4)
- (4) Electrical Reentry (4)

NOTIFICATIONS - ERO, STATE & COUNTIES, AND NRC

(f) I&C Supervisor _____ (Name)

- (1) I&C Leader (1)
- (2) I&C Reentry (4)

(g) Chemistry Supervisor _____ (Name)

- (1) Chemistry Leader (1)
- (2) Chemistry Reentry (4)

b. Return this procedure section to Emergency Preparedness or include in the TSC Manager turnover package.

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

5.2 Notifications to State and Counties

NOTE 1: The notification of state and county emergency government agencies shall be notified within 15 minutes of event classification, event termination, or change in protective action recommendations.

NOTE 2: The State Radiological Coordinator may place a separate call to obtain additional information for purposes of determining State and County Emergency Operation Center(s) activations.

NOTE 3: Priority levels are assigned to Two-Digit Dial-Select communications as follows:

	Siren Activation
	Event Notification/PAR Upgrade
	Status Update
	General Information

NOTE 4: IF the event is classified as a General Emergency, THEN recommend minimum protective actions.

5.2.1 The Emergency Director shall complete or delegate the completion of Attachment B, Nuclear Accident Reporting Form.

5.2.2 The Emergency Director shall approve the contents of Attachment B, Nuclear Accident Reporting Form, prior to the release of the information.

5.2.3 Provide this procedure section and the completed form to the person designated to make the communications, conducting a verbal review of the information as required.

NOTE: IF the Two-Digit Dial-Select is out-of-service, THEN use commercial telephones (ref. Emergency Telephone Directory) to make the notification.

5.2.4 Record the callback number for the facility you are calling from on Attachment B, Nuclear Accident Reporting Form.

- Control Room -
- Emergency Operations Facility -
- Technical Support Center -

5.2.5 Using the Two-Digit Dial-Select telephone:

- Pick up the handset and ask if the line is clear. (Similar to Gai-tronics)
- **IF** the line is busy,
THEN inform them of your Priority 2 notification.
- They will clear the line, unless a Priority 1 discussion is in progress.
- When the line is clear, continue with the notification.

NOTE 1: IF unable to contact a specific agency after five (5) rings, THEN press the # key to stop the ringing and continue with the notification to the agencies online. Then use commercial telephone lines to contact those agencies which were not reached.

NOTE 2: Two locations will ring for the State: WEM in Madison and State Patrol (off-hours). Press the # key to stop the ringing if one location does not answer.

5.2.6 Dial " " to contact the following agencies simultaneously:

- Manitowoc County Sheriff Dispatcher
- Kewaunee County Sheriff Dispatcher
- State of Wisconsin Emergency Management (WEM)

5.2.7 Record the time and the name of the person who answers FOR EACH AGENCY on Attachment B, Nuclear Accident Reporting Form, you are transmitting.

5.2.8 Request each agency to remain on the line while you communicate the event information.

5.2.9 Request each agency to remain on the line while you ask one agency (preferably the State) to repeat the information as a confirmation of accuracy.

5.2.10 Request each agency to transmit the event information to appropriate personnel within their agency, instructing those individuals to place a return call to you to verify the notification.

5.2.11 **IF** commercial telephone lines must be used to complete the notifications, **THEN** call each of the following agencies as appropriate, repeating Steps 5.2.7 through Step 5.2.10.

- Manitowoc County Sheriff Dispatcher,
- Kewaunee County Sheriff Dispatcher,
- State of Wisconsin Emergency Management (WEM), (

NOTE: **IF** unable to remain at the callback number, **THEN** ensure an alternate person has assumed your responsibilities at that location.

5.2.12 Fax Attachment B, Nuclear Accident Reporting Form, to the following agencies using the pre-programmed keys or referencing the Emergency Telephone Directory.

- State of Wisconsin Emergency Management (WEM)
- Manitowoc County Emergency Management
- Kewaunee County Emergency Government
- Emergency Response Facilities (If Activating)

5.2.13 Remain at the callback number until the callback verifications have been received from the three agencies, recording the time and name of each caller on Attachment B, Nuclear Accident Reporting Form.

5.2.14 Return Attachment B, Nuclear Accident Reporting Form, to the Emergency Director.

NOTIFICATIONS - ERO, STATE & COUNTIES, AND NRC

5.3 Notifications to WE Media Line and KNPP

5.3.1 Obtain an approved copy of Attachment B, Nuclear Accident Reporting Form.

5.3.2 Contact the Wisconsin Electric Communications and Community Relations Department at _____ and relay the event information on Attachment B, Nuclear Accident Reporting Form.

(Outside normal working hours, you may be asked to provide a callback number and an On-Call Nuclear Information Representative will return your call.)

Contact Name: _____ Time: _____

Classification Transmitted: _____

5.3.3 Contact the Kewaunee Nuclear Power Plant Control Room at _____ and relay the event information on Attachment B, Nuclear Accident Reporting Form.

Contact Name: _____ Time: _____

Classification Transmitted: _____

5.3.4 Return this procedure section and Attachment B, Nuclear Accident Reporting Form, to the Emergency Director.

Performed By:

_____ /
Performer (Print and Sign)

Date / Time

5.4 Notifications to the NRC

NOTE: The notification to the NRC shall be completed immediately following the notifications to the state and counties and not exceeding 60-minutes from event classification, event termination, or change in protective action recommendations.

5.4.1 Emergency Director shall provide this procedure and the completed Attachment B, Nuclear Accident Reporting Form, from Step 5.2.1 to the person designated to make the notification, conducting a verbal review of the information, as required.

NOTE 1: Do not dial ' ' prefix on the NRC ENS phone.

NOTE 2: If the FTS-2000 ENS phone is out-of-service, use commercial telephones (ref. Emergency Telephone Directory) to make the notification.

NOTE 3: The NRC may request a continuous open line of communication be maintained without regard to event classification. This request shall be honored if at all possible.

5.4.2 Contact the NRC Operations Center via the FTS-2000 ENS phone by dialing the number listed on the NRC sticker on the phone cradle. If number is busy, try the next number listed.

5.4.3 Record the time and name of the NRC Duty Officer on Attachment B, Nuclear Accident Reporting Form, you are transmitting.

5.4.4 Communicate the event information clearly and concisely.

5.4.5 Fax the Nuclear Accident Reporting Form to the NRC using the pre-programmed fax key or referencing the Emergency Telephone Directory.

5.4.6 Make an entry into the appropriate NRC phone log.

- Control Room
- Technical Support Center

5.4.7 **IF** not previously notified,
THEN contact the NRC resident inspector.

Contact Name: _____ Time: _____

Classification Transmitted: _____

5.4.8 Return Attachment B, Nuclear Accident Reporting Form, to the Emergency Director.

5.5 Status Updates to State and Counties

NOTE: Status updates should be made to State and County Emergency agencies approximately hourly, upon a major change in plant/radiological status, or at their request.

5.5.1 Use Attachment C, Plant Status Update, and/or Attachment D, Radiological Status Update, as a guideline for verbally communicating status updates.

NOTE: IF unable to contact a specific agency, THEN continue with the notification to other agencies, attempt to contact those agencies which have not been contacted.

NOTE: IF the Two-Digit Dial-Select is out-of-service, THEN use commercial telephones (preferably via conference call referring to the Emergency Telephone Directory) to make the status update.

5.5.2 Using the Two-Digit Dial-Select telephone:

- Pick up the handset and ask if the line is clear. (Similar to Gai-tronics)
- IF the line is busy, THEN inform them of your Priority 3 notification.
- They will clear the line, unless a Priority 1 or 2 discussion is in progress.
- When the line is clear, continue with the notification.

NOTE: IF unable to contact a specific agency after five (5) rings, THEN press the # key to stop the ringing. Contact those agencies by commercial telephone after completing the status update.

5.5.3 Dial " , , and " consecutively to contact the following agencies simultaneously:

- - Manitowoc County EOC
- - Kewaunee County EOC
- - State of Wisconsin Emergency Management (WEM) EOC

5.5.4 Request each agency remain on the line while you communicate the status update event information and answer questions.

- 5.5.5 **IF** commercial telephone lines must be used to complete the notifications, **THEN** call the following agencies (ref. Emergency Telephone Directory):
- Manitowoc County EOC
 - Kewaunee County EOC
 - State of Wisconsin Emergency Management (WEM) EOC
- 5.5.6 **IF** a request has been made by the State or County for a hard copy Attachment C, Plant Status Update, or Attachment D, Radiological Status Update, **THEN** complete the appropriate section(s), obtain the Emergency Director approval, and fax using the pre-programmed fax keys or referencing the Emergency Telephone Directory.
- State of Wisconsin Emergency Management (WEM)
 - Manitowoc County Emergency Management
 - Kewaunee County Emergency Government
 - Emergency Response Facilities (If Activating)
- 5.5.7 Repeat Steps 5.5.2 through 5.5.6 each time a status update is required.
- 5.5.8 **IF** a completed Attachment C, Plant Status Update, or Attachment D, Radiological Status Update, was faxed to the State or County, **THEN** return the appropriate completed attachment(s) to the Emergency Director.

5.6 Status Updates to the NRC

NOTE 1: The NRC should receive status updates approximately hourly, upon a major change in plant/radiological status, or at their request.

NOTE 2: Do not dial "1" prefix on the NRC FTS-2000 ENS phone.

NOTE 3: IF the FTS-2000 ENS phone is out-of-service, THEN use commercial telephones (ref. Emergency Telephone Directory) to make the notification.

NOTE 4: The NRC may request that a continuous open line of communication be maintained without regard to event classification.

5.6.1 Use Attachment E, Status Report on Plant Systems and Controls for Affected Unit, as a guideline for verbally communicating status updates.

5.6.2 Contact the NRC Operations Center via the FTS-2000 ENS phone by dialing the number listed on the NRC sticker on the phone cradle. If number is busy, try the next number listed.

5.6.3 **IF** a request is made by the NRC to fax a completed Attachment E, Status Report on Plant Systems and Controls for Affected Unit, **THEN** complete the form, obtain the Emergency Director approval, and fax to the NRC.

5.6.4 **IF** a completed status update form was faxed to the NRC, **THEN** return the completed Attachment E, Status Report on Plant Systems and Controls for Affected Unit, to the Emergency Director.

6.0 REFERENCES

- 6.1 WE-NRC (Plant 12.3), May 19, 1983, Staffing Levels for Emergency Situations, Point Beach Nuclear Plant
- 6.2 NRC-WE, December 20, 1985, Inspection Report Nos. 50-266/83-01 and 50-301/83-01
- 6.3 Emergency Plan, EP 5.0, Organizational Control of Emergencies

7.0 BASES

- B-1 10 CFR 50.47(b), Emergency Plans
- B-2 10 CFR 50.72, Immediate Notification Requirements for Operating Nuclear Power Reactors
- B-3 NUREG-1022, Event Reporting Guidelines, 10 CFR 50.72 and 50.73, Rev 1, January 1998

ATTACHMENT A
AUTOMATED NOTIFICATION SYSTEM SCENARIO SELECTION MATRIX

Emergency Class	Facility Activation	Plant Approach
- Unusual Event	- NO Facility Activation	- Use NORMAL routes
- Alert	- Activate PBNP ERFs	- Approach PBNP from the SOUTH
- Site Emergency	- Activate all ERFs	- Approach PBNP from the NORTH
- General Emergency		
- Disregard previous page.		

- Determine the 3-digit scenario to be activated from matrix above choosing one number from each column. Record here: _____

Example Scenario: "Site Emergency/Activate All ERFs/Use normal routes" would be Scenario .

ATTACHMENT B
NUCLEAR ACCIDENT REPORTING FORM

NOTE: Direct state and counties to record the information on the State of Wisconsin Nuclear Accident Reporting System (NARS form).

1. Status (A) Actual (C) Drill (B) Exercise (D) Termination	2. Station (T) Point Beach	3. On-site Incident Classification (A) Unusual Event (D) General Emergency (B) Alert (E) Recovery (C) Site Emergency (F) Not Applicable																												
4. Incident Classification/Termination Time: _____ / _____ Date: _____ / _____ EAL # _____	5. Release to Environment (A) None (B) Potential (C) Occurring (D) Terminated	6. Type of Release (A) Not Applicable (B) Radioactive Gas (C) Radioactive Liquid																												
7. Wind Direction Degrees From: _____ Downwind Sector: _____	8. Wind Speed (B) Miles/hr: _____																													
9. Protective Actions Recommended (A) None (B) Evacuate 0-2 mile radius (C) Evacuate 0-5 miles radius (D) Evacuate 2-5 miles for Sectors _____ (E) Evacuate 5-10 miles for Sectors _____ (F) Other _____																														
10. Additional Information From EAL Table - Affected Unit: _____ _____ _____ Emergency Director Approval: _____ Date / Time _____ / _____																														
11. Immediately upon Emergency Director approval, relay information to Emergency Managements (EM) listed. Request the answering parties to have the appropriate EM personnel call 920/____ - _____ for notification verification. State/County message transmitted by _____ in the Point Beach Nuclear Plant _____. (Name) (CR/TSC/EOF/AEOF)																														
12. STATE/COUNTY ANSWERED <table border="1"><thead><tr><th>Agency</th><th>Time</th><th>Name</th><th>Position</th><th>Time</th><th>Name</th><th>Contact Phone #</th></tr></thead><tbody><tr><td>Manitowoc Co</td><td>_____</td><td>_____</td><td>EM Director</td><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>Kewaunee Co</td><td>_____</td><td>_____</td><td>EM Director</td><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>Wisconsin</td><td>_____</td><td>_____</td><td>Duty Officer</td><td>_____</td><td>_____</td><td>_____</td></tr></tbody></table>			Agency	Time	Name	Position	Time	Name	Contact Phone #	Manitowoc Co	_____	_____	EM Director	_____	_____	_____	Kewaunee Co	_____	_____	EM Director	_____	_____	_____	Wisconsin	_____	_____	Duty Officer	_____	_____	_____
Agency	Time	Name	Position	Time	Name	Contact Phone #																								
Manitowoc Co	_____	_____	EM Director	_____	_____	_____																								
Kewaunee Co	_____	_____	EM Director	_____	_____	_____																								
Wisconsin	_____	_____	Duty Officer	_____	_____	_____																								
13. NRC ANSWERED - Callback Verification Not Required Duty Officer Name _____ Time _____ Continuous phone link requested: ___ No ___ Yes NRC message transmitted by _____ in the Point Beach Nuclear Plant _____. (Name) (CR/TSC/EOF/AEOF)																														

ATTACHMENT C
PLANT STATUS UPDATE

Check One: Actual Drill Exercise

1. Point Beach Nuclear Plant

2. Date/Time: _____/_____/_____

3. Description of Event: _____

4. Emergency Action Level(s): _____

5 Major Equipment Affected: (LIST)

- | | |
|----------|----------|
| a. _____ | b. _____ |
| c. _____ | d. _____ |
| e. _____ | f. _____ |

6. Reactor Status: (Check one)

- a. _____ Critical
b. _____ Shutdown

7. Radiological boundaries Lost(L) or Threatened(T):
(Indicate all that apply)

- a. _____ Fuel Cladding
b. _____ Reactor Coolant System
c. _____ Containment

8. Plant Personnel Status (Enter # or N/A for each type incident):

- | | |
|--|---|
| a. # _____ Deaths | b. # _____ Overexposure to Personnel |
| c. # _____ Injured Personnel Treated On-Site | d. # _____ Injured Personnel Treated Off-Site |
| e. # _____ Contaminated Personnel On-Site | f. # _____ Contaminated Personnel Off-Site |
| g. Other (explain): _____ | |

9. Areas Affected by A Radiological Release

- a. Plume Path (Downwind Sectors): _____ : _____ : _____ : _____ Distance _____ (mi)
b. Deposition (Describe Location): _____

10. News Statement from the JPIC or Established Media Center

- a. The Next News Statement is Scheduled for: Date: _____ Time: _____

11. State or Local Assistance Requested by the Plant

Emergency Director Approval: _____ Date / Time _____/_____/_____

Manitowoc Co. _____ (Time) Kewaunee Co. _____ (Time) Wisconsin WEM _____ (Time)

Communicated By: _____

ATTACHMENT D
RADIOLOGICAL STATUS UPDATE
Page 1 of 3

Check One: Actual Drill Exercise

1. Point Beach Nuclear Plant

2. Date/Time: ____/____/____

3. Plant Status:

a. General: ____ Improving ____ Stable ____ Degrading
b. Electrical Power: ____ Satisfactory ____ Problems

If problems, describe: _____

4. Offsite Radiological Conditions:

a. Release Prognosis:

____ No Release is expected
____ Release is expected at the start time listed in 4b.
____ Release is in progress

b. Event Times (Complete all applicable times):

____ Reactor Trip
____ Start of release to containment
____ Start of release to environment
____ *Release Stop
*(Actual / Estimated / Default) Line out inappropriate word(s)

c. Type of Release:

____ Liquid ____ Controlled ____ Monitored
____ Airborne ____ Uncontrolled ____ Unmonitored

Release Path: _____

d. Plume Path (Downwind Sectors): ____: ____: ____: ____ Distance ____ (mi)

e. Downwind Doses at the Plume Centerline:

Based on: __ Projections __ Field Measurement

1 Mi (SBCC)	____ rem TEDE	____ rem CDE Thyroid
2 Mi.	____ rem TEDE	____ rem CDE Thyroid
5 Mi.	____ rem TEDE	____ rem CDE Thyroid
10 Mi.	____ rem TEDE	____ rem CDE Thyroid

ATTACHMENT D
RADIOLOGICAL STATUS UPDATE
Page 2 of 3

f. Surface Deposition: Based on: _____ Projection _____ Field Measurement
dpm/100 cm² - Ci/m² _____ Location: _____
dpm/100 cm² - Ci/m² _____ Location: _____
dpm/100 cm² - Ci/m² _____ Location: _____
(Line out inappropriate unit)

g. Recommended protective actions were made at (Time: _____) on the Wisconsin Nuclear Accident Reporting System form.

5. Meteorological Conditions:

a. Wind Speed: _____ MPH
b. Wind Direction: _____ Degrees
c. Stability Class (circle one): A B C D E F G
d. Mixing Layer Height: _____ Ft.
e. Precipitation (check one):
_____ Light Rain _____ Moderate Rain _____ Heavy Rain _____ None
_____ Light Snow _____ Moderate Snow _____ Heavy Snow

6. Reactor Status: _____ At Power (_____ Megawatts Thermal)
_____ Tripped (Power Level at trip _____ Megawatts Thermal)
_____ Hot Shutdown (Current RCS Temperature _____ deg. F.)
_____ Cold Shutdown (RCS is less than 200°F.)

7. Core Status: _____ No Damage Expected
_____ Core Damage sequence in progress (Est. Time: _____)
_____ Gap Release (Est. Time: _____)
_____ In-Vessel Severe Core Damage (Est. Time: _____)
_____ Vessel Melt Through (Est. Time: _____)

Core Exit Temperature: _____ Increasing _____ Stable _____ Decreasing

8. Containment Status:

a. Containment Spray: _____ ON
_____ OFF
b. Containment Leak Rate
_____ None
_____ Calculated (_____ cc/sec)
_____ Design Rate (0.1% per day)
_____ 100% per Day
_____ 100% per Hour
c. Pressure: _____ Increasing
_____ Stable
_____ Decreasing
d. Temperature: _____ Increasing
_____ Stable
_____ Decreasing

ATTACHMENT D
RADIOLOGICAL STATUS UPDATE

Page 3 of 3

9. Steam Generator Status:

- a. Leak Rate (Check One):
 None
 Full Pressure (# of tubes _____)
 Low Pressure (# of charging pumps _____)
 Calculated (Gallons per minute _____)
- b. Reactor Coolant Concentrations:
 N/A (No Leak)
 Normal
 100x normal non-nobles
 Calculated Concentration (Attached Analysis)
- c. Partitioning:
 N/A (No leak)
 Leak is above steam generator water level (default)
 Leak is below steam generator water level
- d. Release Path
 None
 Safety Valve (or PORV)
 Air Ejector

10. Containment Bypass Status:

- a. Containment Bypass Leak Rate
 None
 Calculated (_____ cc/sec)
 0.1% per Day
 100% per Day
 100% per Hour
- b. Release Path:
 None
 Filtered
 Unfiltered

11. Gross Release Rate Data:

- a. Not Applicable (No Leak)
- b. Not Available
- c. Total _____ Ci/sec Kr, Xe _____% Iodines _____% Cs _____% Te, Sb _____%
 Ba, Sr _____% Ru, Mo _____% La, Y, Ce, Np _____%

12. Specific Isotopic Release Data (Ci/sec):

- a. Not Applicable (No leak)
- b. Not available
- | | | | |
|--------------------------|---------------------------|---------------------------|---------------------------|
| c. H-3 _____ | Sr-91 _____ | Te-131 _m _____ | Xe-133 _m _____ |
| Mn-54 _____ | Y-91 _____ | Te-132 _____ | Xe-135 _____ |
| Co-58 _____ | Mo-99 _____ | I-131 _____ | Xe-138 _____ |
| Kr-85 _____ | Te-99 _m _____ | I-132 _____ | Cs-134 _____ |
| Kr-85 _m _____ | Ru-103 _____ | I-133 _____ | Cs-136 _____ |
| Kr-87 _____ | Ru-106 _____ | I-134 _____ | Cs-137 _____ |
| Kr-88 _____ | Sb-127 _____ | I-135 _____ | Ba-140 _____ |
| Sr-89 _____ | Sb-129 _____ | Xe-131 _m _____ | La-140 _____ |
| Sr-90 _____ | Te-129 _m _____ | Xe-133 _____ | Ce-144 _____ |

Emergency Director Approval: _____ Date / Time _____ / _____

Manitowoc Co. _____ (Time) Kewaunee Co. _____ (Time) Wisconsin WEM _____ (Time)

Communicated By: _____

ATTACHMENT E
STATUS REPORT ON PLANT SYSTEMS AND CONTROLS FOR AFFECTED UNIT
Page 1 of 2

Check One: Actual Drill Exercise

1. Basic Accident Information (Unit _____)

- a. Status Report Date/Time: _____ / _____; Report # _____
(Date) (Time-24 Hours)
- b. Emergency Classification: _____
- c. (If applicable) Time of Reactor Shutdown: _____ hrs.
- d. (If applicable) Time of Radiological Release to Containment: _____ hrs.
- e. (If applicable) Time of Radiological Release from Plant: _____ hrs.

2. Status of Reactivity Control

Subcritical Yes _____ No _____

3. Status of Core Cooling

- a. Highest Th _____ °F Coldest Tc _____ °F
- b. Incore Thermocouples: Average Temperature _____ °F
- c. Pressurizer Heaters Available Yes _____ No _____
- d. Subcooling Margin: _____ °F

4. Status of Reactor Coolant System Integrity

- a. Pressurizer or Reactor System Pressure _____ psig
- b. Pressurizer Level _____ %
- c. Primary System Relief Valves Closed Yes _____ No _____
- d. Letdown Flow _____ gpm
- e. Charging Pump Flow _____ gpm

5. Status of Secondary Systems

- a. Steam Generator Pressure "A" _____ psig "B" _____ psig
- b. Steam Generator Level "A" _____ % "B" _____ %
- c. Feedwater Flow, Auxiliary "A" _____ gpm "B" _____ gpm
Main "A" _____ klbm/h "B" _____ klbm/h

6. Containment

- a. Pressure WR _____ psig NR _____ psig
- b. Containment Spray Flow _____ gpm
- c. NaOH Addition Yes _____ No _____ Time _____ Level _____ %
- d. Containment Recirculation Coolers Running (Circle) 1 2 3 4
- e. Sump B Level _____ inches
- f. H₂ Concentration _____ %
- g. Containment Isolation Valves (Note any not closed) _____

ATTACHMENT E
 STATUS REPORT ON PLANT SYSTEMS AND CONTROLS FOR AFFECTED UNIT
 Page 2 of 2

7. Safeguards Systems

- | | | | |
|----|---|----------------------|-----------------|
| | | <u>Train A</u> | <u>Train B</u> |
| a. | Safety Injection | | |
| | High Head | _____ gpm | _____ gpm |
| | Low Head | _____ gpm | _____ gpm |
| b. | Accumulators | | |
| | Level | _____ % | _____ % |
| | Pressure | _____ psig | _____ psig |
| | Isolation Valve Open | Yes/No | Yes/No |
| c. | Refueling Water Storage Tank Level | _____ % | |
| d. | Component Cooling Water | | |
| | Temperature | inlet _____ °F | outlet _____ °F |
| | Flow | _____ gpm | |
| e. | Service Water No. of pumps running | _____ Temp. _____ °F | |
| f. | ESF pump (SI, RHR, AFW, CS) recirculation status, enter in remarks. | | |

8. State of Meteorology

- | | | |
|----|--|---------------------|
| | Primary Tower | Inland Tower |
| | 10M | 45M |
| a. | Wind Direction (avg.) | _____ ° |
| b. | Wind Speed | _____ mph |
| c. | $\sigma\theta$ | _____ ° |
| d. | $\Delta T/\Delta H$ | _____ °F |
| e. | Atmospheric Stability Class | _____ |
| f. | Lake Breeze Conditions Exist? (circle) | Yes / No |

9. Status of Power Supplies

- | | | | | | | | |
|----|----------------|--------|-------|--------|-------|-------------|-------|
| | | Unit 1 | Y / N | Unit 2 | Y / N | Gas Turbine | Y / N |
| a. | Offsite Power | | | | | | |
| b. | Diesel Running | G01 | Y / N | G02 | Y / N | G03 | Y/N |
| | Diesel Loaded | G01 | Y / N | G02 | Y / N | G03 | Y/N |
| | | | | | | G04 | Y/N |
| | | | | | | G04 | Y/N |

10. Other Equipment Remarks:

Emergency Director Approval: _____ Date / Time _____ / _____
 Communicated to NRC By: _____ Date / Time _____ / _____

EPIP 6.1

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND EVACUATION OF PERSONNEL



*Wisconsin
Electric
Power Company*

DOCUMENT TYPE: Technical

CLASSIFICATION: NNSR

REVISION: 17

EFFECTIVE DATE: February 18, 2000

APPROVAL AUTHORITY: Department Manager

PROCEDURE OWNER (title): Group Head

OWNER GROUP: Emergency Preparedness

Verified Current Copy: _____
Signature Date Time

List pages used for Partial Performance

Controlling Work Document Numbers

NAMES AND
TELEPHONE NUMBERS
DELETED

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ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
EVACUATION OF PERSONNEL

1.0 PURPOSE

This procedure describes protective actions to be taken for personnel within the protected area and exclusion areas. These actions include assembly, accountability, release, and evacuation. These actions may be performed on a limited plant or a full-site basis.

- 1.1 Assembly will consist of an orderly gathering of people into designated assembly areas onsite or offsite. An assembly will be conducted at a Site Emergency or higher classification, or under any circumstance deemed necessary by the Duty Shift Superintendent (DSS), or TSC Manager.
- 1.2 Accountability is the gathering of the names of people assembled and maintaining control of their movement.
- 1.3 Release of personnel is the orderly dismissal of personnel not immediately needed for response when no radiological conditions prohibit an unmonitored release from the site.
- 1.4 Evacuation is the process implemented where radiological or other hazards require additional actions, such as radiological monitoring and relocation of assembly areas, in conjunction with the release of personnel.

An early release of visitors, contractors, and non-essential plant and company personnel from the site eliminates the need, in most cases, for burdensome radiological screening of persons and vehicles associated with an evacuation.

2.0 PREREQUISITES

2.1 Responsibilities

- 2.1.1 This procedure is the responsibility of the Duty Shift Superintendent (DSS) until assumed by the TSC Manager.
- 2.1.2 The DSS may assign this procedure to an operating supervisor, typically from the unaffected unit.
- 2.1.3 Upon activation of the emergency response facilities, this procedure is the responsibility of the TSC Manager, who may designate responsibilities to other qualified personnel.
- 2.1.4 The Rad/Chem Coordinator and Offsite Radiation Protection Coordinator are responsible for the radiological monitoring of personnel and vehicles if required prior to leaving site property.

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
EVACUATION OF PERSONNEL

2.2 Equipment

- 2.2.1 Fisherman's Alarm
- 2.2.2 Gai-Tronics
- 2.2.3 Point Beach Automated Notification System
- 2.2.4 Point Beach PBX Telephone System
- 2.2.5 Public Address system in the Nuclear Engineering Support Building

2.3 Onsite Assembly Areas (Within Owner-Controlled Area)

LOCATION	PERSONNEL ASSEMBLED
NSB Cafeteria*	Plant Personnel - Workstations in PA (Ops Office & North)
Admin Bldg - El 26'*	Plant Personnel - Workstations in PA (South of Ops Office)
Warehouse #4	Plant Personnel - Workstations outside PA (North end) Other company personnel, Contractors, Visitors
Nuclear Eng. Bldg Cafeteria	Plant Personnel - Workstations outside PA (South end) Other company personnel, Contractors, Visitors
Training Bldg North Foyer	Plant Personnel - Workstations outside PA (South end) Other company personnel, Contractors, Visitors
RP Station*	Chemistry inside RCA & all RP
Control Room*	Onshift Operations Personnel
Technical Support Center*	Assigned ERO Personnel
Emergency Operations Facility	Assigned ERO Personnel
Operations Support Center*	Chemistry outside RCA, Assigned ERO Personnel, Operations Relief/Training Crews
CAS*	Security Personnel
Other temporary assembly areas may be assigned to accommodate unusual situations (i.e., construction)	Personnel affected by these temporary assembly areas will be directly notified in the announcements for assembly

*Assembly areas with card readers

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
EVACUATION OF PERSONNEL

2.4 Offsite Assembly Areas (Outside Owner-Controlled Area)

PROBABLE ONSITE ASSEMBLY AREAS NEEDING RELOCATION	ALTERNATE LOCATIONS
Admin Building El. 26' NSB Cafeteria NES Building Cafeteria Training Building North Foyer Warehouse #4	Two Creeks Town Hall Two Rivers National Guard Armory
Emergency Operations Facility (EOF) Offsite Radiation Protection Facility (OSRPF)	Alternate EOF TSC (partial EOF positions) KNPP Site Boundary Facility (OSRPF Only)
Technical Support Center (TSC) Operations Support Center (OSC)	Admin Bldg El. 26' Control Room or Computer Room Above NSB Cafeteria Site Boundary Control Center

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Radiological conditions may make it necessary to use alternate routes and/or assembly areas.
- 3.2 **IF** personnel cannot access their designated assembly areas, **THEN** personnel should report to the nearest assembly area.
- 3.3 Unless otherwise directed by the announcement, personnel exiting the controlled area should:
 - 3.3.1 Remove protective clothing.
 - 3.3.2 Frisk at the RCA checkpoint.
 - 3.3.3 Retain dosimetry.
 - 3.3.4 Report to assigned assembly area.
- 3.4 Accountability of personnel in the protected area shall be accomplished within 30 minutes of the evacuation alarm for a full-site assembly.
- 3.5 Protracted emergencies must consider 24-hour staffing, neither retaining or releasing too many persons from any particular group.
- 3.6 Emergency response facilities shall reference the appropriate EIPs for activation and evacuation of each specific facility.

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
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4.0 INITIAL CONDITIONS

- 4.1 A limited plant evacuation shall be considered under any of the following conditions:
- 4.1.1 Area radiation monitor high-level alarm in excess of 100 mR/hr.
 - 4.1.2 Airborne radioactive concentrations in excess of the derived air concentrations (DACs) specified in Appendix B to 10 CFR 20.
 - 4.1.3 Valid containment alarm is necessary.
 - 4.1.4 Excessive radioactive surface contamination levels due to a major spill of radioactive materials.
 - 4.1.5 Other emergency conditions that may endanger human life or health (i.e., fire, flooding, toxic gases, etc.).
- 4.2 A full-site assembly and accountability shall be conducted under any of the following conditions:
- 4.2.1 A Site Emergency or higher classification has been declared.
 - 4.2.2 Radiation levels in general areas of the protected area exceed 100 mR/hr.
 - 4.2.3 Airborne activity in general areas of the protected area exceed derived air concentration and exposures are expected to exceed 40 DAC hours (equivalent to approximately 100 mR).
 - 4.2.4 Other emergency conditions in general areas of the protected area that may endanger human life or health (i.e., fire, flooding, toxic gases, etc.).
 - 4.2.5 The DSS or TSC Manager has determined that assembly and accountability of all personnel is desired.
- 4.3 A full-site assembly and accountability shall be completed prior to the release or evacuation of non-essential personnel from the site.

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
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- 4.4 An evacuation of non-essential personnel to offsite assembly areas shall be considered under any of the following conditions:
- 4.4.1 Gross activity outside the protected is greater than $5.3 \times 10^{-7} \mu\text{Ci/cc}$. (This would result in a two-hour dose to the thyroid of 2 rem assuming the predominate isotope is I-131.)
 - 4.4.2 Projected doses in assembly areas are approaching or exceed the following:
 - a. Whole body gamma 1.5 rem
 - b. Thyroid 5 rem
 - c. Beta skin dose 3 rem
 - 4.4.3 Radiation levels in the exclusion areas outside the protected area are in excess of 10 mrem/hr whole body.
 - 4.4.4 Other emergency conditions that may endanger human life or health (i.e., fire, flooding, toxic gases, etc.).

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
EVACUATION OF PERSONNEL

5.0 PROCEDURE

5.1 Limited Plant Evacuation

NOTE: IF a security event, THEN contact Security to discuss the consequences of conducting a limited plant evacuation and the appropriate actions to implement.

- 5.1.1 Remove and complete Attachment A, Announcement of Protective Action.
- 5.1.2 Sound the plant evacuation alarm (and fire alarm, if appropriate).
- 5.1.3 Read the completed Attachment A, Announcement of Protective Action, over the Gai-tronics.
- 5.1.4 Repeat Step 5.1.2 and 5.1.3.
- 5.1.5 Contact the Radiation Protection Supervisor/Technologists to implement the appropriate Radiation Protection practices.

NOTE: Unrestricted reentry to a(n) evacuated area(s) can be restored when it has been determined by the DSS and Radiation Protection Supervision that there is no longer a hazard to personnel.

- 5.1.6 Evaluate the conditions and initiate actions to:
 - a. isolate affected area(s).
 - b. allow reentry to evacuated area(s).
- 5.1.7 **IF** the hazard continues to increase in severity, **THEN** consider the implementation of Step 5.2, Full-Site Assembly and Accountability.
- 5.1.8 Return this procedure section and completed Attachment A, Announcement of Protective Action, to Emergency Preparedness or to the TSC Manager.

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

5.2 Full-Site Assembly and Accountability

5.2.1 Notification of Personnel

NOTE 1: IF a security event, THEN contact Security to discuss the consequences of conducting an assembly and the appropriate actions to implement.

NOTE 2: When the TSC is activated, the responsibility for assembly, accountability, release, and evacuation of personnel is transferred from the DSS to the TSC Manager.

- a. Remove and complete Attachment A, Announcement of Protective Action, for personnel inside and outside the protected area.
- b. Contact CAS and direct Security to implement sections of their security plan, including:
 - Activate accountability readers and notify the Duty Shift Superintendent when accountability is achieved **OR** if personnel remain unaccounted for.
 - Notify personnel outside the protected area via broadcast message and security sweep and advise them of protective actions to implement per Attachment A.
- c. Sound the fisherman's alarm.
- d. Sound the plant evacuation alarm (and fire alarm, if appropriate) to initiate assembly and accountability.
- e. Read the completed Attachment A, Announcement of Protective Action, over the Gai-tronics.
- f. Repeat Steps 5.2.1.d and 5.2.1. e.
- g. **IF** Security is unable to notify personnel outside the protected area, **THEN** initiate and complete Attachment B.
- h. Contact the Supervisor-Point Beach Energy Center and direct them to complete Attachment C, Evacuation of the Point Beach Energy Center, of this procedure.

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
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5.2.2 Accountability

NOTE 1: IF accountability of the protected area personnel is not complete within 30 minutes of an evacuation alarm, THEN make preparations to implement EPIP 10.1, Emergency Reentry.

NOTE 2: Teams dispatched from the Control Room shall be tracked by the DSS or a designee until relieved by the OSC.

- a. Monitor accountability with Security and implement Attachment D, Accountability Announcement, if personnel remain unaccounted for AND/OR when accountability within the protected area has been achieved.

NOTE: In the absence of a designated Assembly Area Leader, anyone reporting may fulfill these duties.

- b. Assembly Area Leaders at each assembly area shall:

- Ensure personnel arriving are entering safely and quickly, remaining quiet during the assembly.
- Request assistance in the assembly area from other personnel as needed.
- Direct personnel arriving to sign-in on Attachment E, Assembly Area Accountability Sign-In, (excluding the CR, TSC, OSC, EOF, OSRPF, and RP Station unless the accountability readers are inoperable).
- Direct all personnel to complete Attachment F, Event Involvement Summary, (excluding the CR, TSC, OSC, EOF, OSRPF, and RP Station).

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
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- Update Attachment E, Assembly Area Accountability Sign-In, as personnel arrive at, or depart from, the assembly area. Personnel shall only leave the assembly area if
 - (a) a valid request is received from an emergency response facility to assist in the event.
 - (b) specific directions are received from the TSC Manager, or designee, to conduct a release of personnel from site.
 - Maintain accountability if personnel are relocated to a different assembly area.
 - Provide information from completed Attachment E, Assembly Area Accountability Sign-In, to CAS, as requested.
 - Contact Security Coordinator in the TSC at ext. _____, only if critical concerns arise.
- c. Return this procedure section and any completed Attachments to Emergency Preparedness or to the TSC Manager.

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

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
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5.3 Release of Non-Essential Personnel from Site

NOTE: Step 5.2 shall be completed prior to this section.

- 5.3.1 **IF** the Rad/Chem Coordinator and Offsite Radiation Protection Coordinator determine radiological monitoring of personnel and vehicles is required prior to leaving the site property,
THEN exit this section and go to Step 5.4.
- 5.3.2 Determine immediate staffing needs and near-term shift schedule for:
- a. Technical Support Center (by TSC Manager)
 - b. Operations Support Center (by Reentry Team Coordinator)
 - c. Control Room (by Duty Shift Superintendent)
 - d. Emergency Operations Facility (by EOF Manager)
 - e. Offsite Radiation Protection Facility (by Offsite RP Coordinator)
- 5.3.3 Evaluate releasing personnel in groups to minimize congestion.
- 5.3.4 Prior to the release of personnel from site, the TSC Manager should coordinate their release with the:
- a. Offsite Assembly Area Coordinator for organizing the release with Offsite Radiation Protection Coordinator and SBCC Security.
 - b. Security to collect SRDs and TLDs prior to release from assembly areas and/or site boundaries.
 - c. EOF Manager to alert Manitowoc and Kewaunee County Emergency Managements for traffic control.
- 5.3.5 Complete Attachment G, Personnel "Release-From-Site" Briefing Checklist, providing the process to follow upon dismissal, as time permits.
- 5.3.6 Complete Attachment H, Emergency Event Information Sheet, evaluating implications that may occur from that data being distributed, as time permits.
- 5.3.7 Complete Attachment I, Evacuation Routes, if personnel should avoid certain areas upon release, as required.

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
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- 5.3.8 Distribute copies of the completed Attachment G, H, and I to each Assembly Area Leader for communication and/or distribution to assembled personnel.
- 5.3.9 Personnel being released from the site should:
 - a. Exit via their usual gatehouse (unless otherwise instructed).
 - b. Leave their badge, TLD, and SRD (if they already have them) at the gatehouses or at SBCC (unless otherwise instructed).
 - c. Proceed to their homes (or to their reception area if home has been evacuated) and remain available.
- 5.3.10 Return this procedure section and completed Attachments G, H, and I to Emergency Preparedness or to the TSC Manager. Exit this procedure.

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

5.4 Evacuation of Non-Essential Personnel to Offsite Assembly Areas

NOTE: IF the Two Creeks Town Hall and/or Two Rivers National Guard Armory are to be used for personnel assembly, THEN verify Security has contacted those agencies to make the facility available for an assembly area prior to the evacuation of personnel.

5.4.1 Determine immediate staffing needs and near-term shift schedule for:

- a. Technical Support Center (by TSC Manager)
- b. Operations Support Center (by Reentry Team Coordinator)
- c. Control Room (by Duty Shift Superintendent)
- d. Emergency Operations Facility (by EOF Manager)
- e. Offsite Radiation Protection Facility (by Offsite RP Coordinator)

5.4.2 Evaluate evacuating personnel in groups and car pools to minimize congestion.

5.4.3 Prior to the evacuation of personnel from site, the TSC Manager should coordinate their release with the:

- a. Rad/Chem Coordinator and/or Offsite Radiation Protection Coordinator to establish radiological monitoring of personnel and vehicles, per Step 5.4.9, prior to leaving the site property.
 - Establish a monitoring and/or decontamination station for personnel and vehicles at one or more of the following locations:
 - (a) Site Boundary Control Center
 - (b) Two Creeks Town Hall
 - (c) Two Rivers National Guard Armory
 - (d) Along the evacuation route, if appropriate

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
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- IF extensive contamination of vehicles is encountered,
THEN impound non-essential vehicles within posted area for later decontamination. Coordinate decontamination efforts of essential vehicles with:
 - (a) Kewaunee Nuclear Power Plant,
 - (b) Wisconsin Public Service Corporation in Two Rivers,
 - (c) Manitowoc County Emergency Management at Roncalli High School.
- b. EOF Manager to alert Manitowoc and Kewaunee County Emergency Managements for traffic control.
- c. Offsite Assembly Area Coordinator for organizing the release with Offsite Radiation Protection Coordinator and SBCC Security.
- d. Instruct Security to establish a check point at each offsite assembly area.
- 5.4.4 Complete Attachment G, Personnel "Release-From-Site" Briefing Checklist, providing the process to follow upon dismissal, as time permits.
- 5.4.5 Complete Attachment H, Emergency Event Information Sheet, evaluating implications that may occur from that data being distributed, as time permits.
- 5.4.6 Complete Attachment I, Evacuation Routes, to determine specific routes that should be taken to offsite assembly areas, forwarding to the Assembly Area Leaders.
- 5.4.7 Distribute copies of the completed Attachment G, H, and I to each Assembly Area Leader for communication and/or distribution to assembled personnel.
- 5.4.8 Personnel being evacuated from the site should:
 - a. Exit via their usual gatehouse (unless otherwise instructed).
 - b. Follow instructions of Security and/or RP in regard to badges, TLDs and dosimetry.
 - c. Proceed to the designated offsite assembly area(s).
 - d. Upon release from the assembly area, return to their homes (or a reception area if their home has been evacuated) and remain available.

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
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5.4.9 Guidelines For Vehicle Surveys

- a. A representative smear survey and frisk are required prior to release of vehicles if an airborne release of radioactive materials has occurred or is suspected.
- b. Smears should be taken of vehicle surfaces and tires, including tread.
 - A direct $\beta\gamma$ frisk may be taken of a representative portion of the vehicle surface only if the ambient count rate is < 200 cpm.
 - $\beta\gamma$ smears and frisk results of vehicles with beta/gamma contamination > 100 cpm/100cm² above background should be decontaminated prior to release.
- c. Return this procedure section and completed Attachment G, H, and I to Emergency Preparedness or to the TSC Manager.

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

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
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5.5 Reentering the Site

5.5.1 IF public protective measures have been implemented, THEN verify access to the plant site has been pre-arranged between the Security Coordinator, Manitowoc and Kewaunee County Sheriff's Department, and the Manitowoc and Kewaunee County Emergency Operations Centers (EOCs).

5.5.2 Notify Security to allow Emergency Response Organization and NRC personnel with picture IDs onsite. Personnel without IDs shall be assessed on a case-by-case basis with the Offsite Assembly Area Coordinator.

6.0 REFERENCES

- 6.1 EP 5.0, Organizational Control of Emergencies
- 6.2 EP 6.0, Emergency Measures
- 6.3 PBSRP 1.6.1, Plant Emergency Evacuation Response

7.0 BASES

- B-1 NUREG 0654, Criteria for Preparation and Evaluation of Radiological Response Plans and Preparedness in Support of Nuclear Power Plants
- B-2 10 CFR 50.47(b), Emergency Plans
- B-3 10 CFR 50.47, Appendix E. IV, Content of Emergency Plans

ATTACHMENT A
ANNOUNCEMENT OF PROTECTIVE ACTION

"ATTENTION ALL PERSONNEL. ATTENTION ALL PERSONNEL. CONDITIONS AT THE PLANT WARRANT A:

- LIMITED PLANT EVACUATION OF THE FOLLOWING AREAS:

ALL PERSONNEL IN THESE AREA(S) REPORT TO THE:

- (In RCA) RP STATION
 (Outside RCA) NORTH SERVICE BUILDING CAFETERIA
 (Other) _____

AND AWAIT FURTHER INSTRUCTIONS."

- FULL SITE ASSEMBLY AND ACCOUNTABILITY

ALL ERO PERSONNEL REPORT TO YOUR ASSIGNED EMERGENCY RESPONSE FACILITY AND PERFORM ACCOUNTABILITY.

ALL REMAINING PERSONNEL REPORT TO:

- YOUR ASSIGNED ASSEMBLY AREA
- NORTH SERVICE BUILDING CAFETERIA
 - ADMIN BUILDING EL 26' OFFICE AREA
 - ENGINEERING BUILDING CAFETERIA
 - TRAINING BUILDING NORTH FOYER
 - WAREHOUSE #4
 - (OTHER) _____
- TWO CREEKS TOWN HALL
 - TWO RIVERS NATIONAL GUARD ARMORY

AND PERFORM ACCOUNTABILITY.

EXIT THROUGH

- YOUR NORMAL GATEHOUSE
- THE NORTH GATEHOUSE
 - THE SOUTH GATEHOUSE

(IF filled in, THEN announce:) AVOID THE FOLLOWING AREA(S) WHEN ASSEMBLING:

THE PLANT CONDITIONS REQUIRING THIS ACTION ARE (classification/condition)

REPEAT ALARM AND ANNOUNCEMENT

Return the completed form to Emergency Preparedness or TSC Manager.

ATTACHMENT B
NOTIFICATION OF PERSONNEL OUTSIDE THE PROTECTED AREA

1.0 PBNP AUTOMATED NOTIFICATION SYSTEM

**NOTE: IF PBNP Automated Notification System is unavailable,
THEN go to Step 2.0.**

- 1.1 From any on-site telephone, dial ext. _____ to access the PBNP Automated Notification System and follow the voice prompt instructions.
- 1.2 When prompted, enter the scenario activation password "_____" using the keypad on the telephone.
- 1.3 When prompted, enter the 3-digit SCENARIO number "_____"
- 1.4 When prompted to record a message, communicate the protective actions to take per Attachment A, Announcement of Protective Action.
- 1.5 When the Point Beach Automated Notification System says, "The scenario is building," press the "#" key, listen to "good-bye," and then hang up.

Completed By _____ Date/Time _____

NOTE: Skip Step 2.0 if Step 1.0 was successful.

2.0 PBX BROADCAST SYSTEM

2.1 Notification of Personnel Outside Protected Area on South Side of Plant

From a touch-tone phone, dial

- 2.1.1 _____ to access voice system
- 2.1.2 _____ # when prompted for mailbox
- 2.1.3 _____ # when prompted for password
- 2.1.4 _____ to compose message
- 2.1.5 _____ # and _____ ## when prompted
- 2.1.6 _____ when prompted

ASSEMBLY AND ACCOUNTABILITY, RELEASE AND
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ATTACHMENT B
NOTIFICATION OF PERSONNEL OUTSIDE THE PROTECTED AREA

- 2.1.7 Read the protective actions to take per Attachment A, Announcement of Protective Action, and press # when done recording.
- 2.1.8 to send message
- 2.1.9 to exit PBX Broadcast System.
- 2.2 Notification of Personnel Outside Protected Area on North Side of Plant
From a touch-tone phone, dial
 - 2.2.1 to access voice system
 - 2.2.2 # when prompted for mailbox
 - 2.2.3 # when prompted for password
 - 2.2.4 to compose message
 - 2.2.5 ## when prompted
 - 2.2.6 when prompted
 - 2.2.7 Read the protective actions to take per Attachment A, Announcement of Protective Action, and press # when done recording.
 - 2.2.8 to send message
 - 2.2.9 to exit PBX Broadcast System.

Completed By _____ Date/Time _____

Return the completed form to Emergency Preparedness or TSC Manager

ATTACHMENT C
EVACUATION OF THE POINT BEACH ENERGY CENTER

NOTE: This attachment is to be completed by the Supervisor - Point Beach Energy Center or a designee upon direction from the Duty Shift Superintendent.

- 1.0 Instruct all Energy Center staff to gather the general public from the Energy Center and surrounding nature trails, providing them with the following directions:
 - 1.1 ALERT or SITE EMERGENCY - Direct all people to leave the PBNP property immediately.
 - 1.2 GENERAL EMERGENCY - Direct all people to:
 - 1.2.1 Drive to the SBCC,
 - 1.2.2 Remain in their vehicles, and
 - 1.2.3 Follow directions of Security or Radiation Protection personnel.
- 2.0 Record the number of people affected and confirm their departure: ____/____
- 3.0 Secure the building.
- 4.0 Inform Security that the Energy Center has been evacuated and ask them to assume responsibility for the area.
- 5.0 Report to the NES Building Cafeteria and await further instructions.

Completed By: _____

Date/Time _____/_____

Return the completed form to Emergency Preparedness or TSC Manager.

ATTACHMENT D
ACCOUNTABILITY ANNOUNCEMENT

This announcement is to be made by the Duty Shift Superintendent or a designee, upon completion of the accountability process.

- IF** all persons are accounted for,
THEN make the following announcement over the Gai-tronics system:

**"ATTENTION ALL PERSONNEL. ATTENTION ALL PERSONNEL.
INITIAL ACCOUNTABILITY HAS BEEN COMPLETED AND ALL PERSONS
ARE ACCOUNTED FOR. MAINTAIN ACCOUNTABILITY THROUGHOUT
THE EMERGENCY."**

Repeat the announcement.

- IF** some persons remain unaccounted for,
THEN make the following announcement over the plant Gai-tronics system:

**"ATTENTION ALL PERSONNEL. ATTENTION ALL PERSONNEL.
INITIAL ACCOUNTABILITY HAS BEEN COMPLETED AND THE
FOLLOWING PERSONS REMAIN UNACCOUNTED FOR:**

**IF YOU HAVE ANY INFORMATION REGARDING THE WHEREABOUTS
OF THESE INDIVIDUALS, PROVIDE THAT INFORMATION TO:**

- C.A.S.
- Other _____."

Repeat the announcement.

Return the completed form to Emergency Preparedness or TSC Manager.

ATTACHMENT F
EVENT INVOLVEMENT SUMMARY

Name: _____ Event Date: _____
Home Telephone: _____ Report Date: _____
Address: _____ Report Time: _____

INSTRUCTIONS: To assist in reconstructing the event, describe any knowledge of, or involvement with, the emergency event and/or event response.

(Use the back of this page if necessary.)

Complete the following portion only if your home is within the 10-mile EPZ.

In response to this event, you **MAY** soon be released from the plant site. In the event your home has been or will be evacuated where would you stay?

_____ With family or friends outside of EPZ.

_____ Family Name: _____ Telephone: _____

_____ At the public shelters.

_____ Unknown. If necessary, I'll call the plant when I've made arrangements.

Return the completed form to the Assembly Area Leader prior to release.

ATTACHMENT G
PERSONNEL "RELEASE-FROM-SITE" BRIEFING CHECKLIST

1.0 TSC MANAGER OR DESIGNEE

- 1.1 Procedures for departure (i.e., TLD, SRD, Protective clothing, radiation monitoring, etc.)

- 1.2 Logistics for departure (i.e., Where to go, Transportation, Accountability, etc.)

- 1.3 Process to return to site (i.e., Reachability, Transportation, Security Issues, etc.)

- 1.4 Offsite Protective Actions Implemented or Pending by State and Counties:

Completed By Date/Time Approved By Date/Time

2.0 ASSEMBLY AREA LEADERS

- 2.1 Ensure all personnel have signed in on Attachment E, Assembly Area Accountability Sign-In, and turned in Attachment F, Event Involvement Summary.
- 2.2 Review the approved Attachment H, Emergency Event Information Sheet, with personnel and provide them with a copy, if available. Stress the portion relative to media information.
- 2.3 If offsite protective actions have been implemented or are impending by the State and Counties, discuss
 - 2.3.1 Reception Center in Manitowoc County is Roncalli High School.
 - 2.3.2 Reception Center in Kewaunee County is Algoma High School.
 - 2.3.3 Red Cross workers at county reception centers will help workers locate their families if they were evacuated.

Communicated By Assembly Area /
Date/Time

Return the completed form to Emergency Preparedness or TSC Manager.

ATTACHMENT H
EMERGENCY EVENT INFORMATION SHEET

1.0 BASIC ACCIDENT INFORMATION

- 1.1 Affected Unit: Unit 1 Unit 2 Common
1.2 Reactor Shutdown: Yes No
1.3 Event Description:

1.4 Major Equipment Problems:

- 1.5 Radiological release to the environment? Yes No

2.0 EMERGENCY EVENT INFORMATION

- 2.1 Event classification:
 Unusual Event Alert Site Emergency General Emergency
2.2 Offsite Protective Actions Implemented by Local Authorities:
 None
 Evacuate *or* Shelter
 0-2 mile radius 0-5 mile radius
 2-5 miles downwind 5-10 miles downwind
2.3 Injured Personnel: Yes No Family Contacted: Yes No
 Status:

3.0 NUMBERS TO CALL FOR ADDITIONAL INFORMATION

NOTE: Please do not ask for a specific individual. This will tie up the system due to the potential volume of calls. State your name and message and where you can be reached, if necessary.

- 3.1 Employees: _____, Resource Coordinator Other _____
(i.e., Return to work during event and protective actions, offsite lodging if home evacuated)
3.2 Contractors: _____, Resource Coordinator Other _____
(i.e., Return to work during event and associated protective actions)
3.3 Media Information _____ (i.e., If contacted by media representatives for information about the emergency event, DO NOT CONSENT to interviews; instead, direct them to obtain official information by calling this number.)

_____	_____	_____	_____
Completed By	Date/Time	Approved By	Date/Time
_____			/
Communicated By	Assembly Area	Date/Time	

Return the completed form to Emergency Preparedness or TSC Manager.

