REVISED 6-21-83

EMERGENCY PLAN IMPLEMENTING PROCEDURES
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WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEDURE	NO. EP-AD-11 REV. C TITLE: Emergency Radiation Controls DATE: JUN 2 1 1983 PAGE 1 of 8
REVIEWED BY M. J. Marchi	APPROVED BY

1.0 PURPOSE

The purpose of this procedure is to maintain exposure to emergency workers As Low As Reasonably Achievable (ALARA).

2.0 APPLICABILITY

This procedure will be implemented during an Alert, Site Emergency or General Emergency.

3.0 REFERENCES

3.1 Emergency Plan, Kewaunee Nuclear Power Plant

3.2 NUREG-0654 FEMA-REP-1, REV. 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparednes in Support of Nuclear Power Plant (Nov. 1980).

3.3 EPA-520/1-75-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (June 1980)

3.4 Code of Federal Regulations 10 CFR Part 20.

3.5 Radiation Protection Manual and Health Physics Procedure Manual Kewaunee Nuclear Power Plant.

3.6 EP-RET-2D - Emergency Radiation Entry, Controls and Implementation.

4.0 RESPONSIBILITIES

4.1 All personnel involved with the Emergency are responsible for adhering to the requirements of this procedure.

4.2 The Radiological Protection Director (RPD) and Emergency Director (ED) are responsible for reviewing and approving all requests for exposures in excess of 10 CFR 20 limits.

4.3 The RPD has the overall responsibility for inplant personnel monitoring.

4.4 The In-plant Radiation Emergency Team (RET) is responsible for performing those activities necessary to implement the requirements of this procedure.

5.0 REQUIREMENTS

5.1 All Emergency Personnel

5.1.1 The requirements of the Health Physics Procedure Manual and the Radiation Protection Manual shall be applicable during all radiological emergencies, except as authorized by the RPD or ED.

5.1.2 Prior to entering a Radiation Hazard Area or highly contaminated area during an Emergency, an Emergency Radiation Work Permit (ERWP, Form AD-11.1) must be completed.

5.1.3 For emergency actions requiring immediate access to radiation hazard areas, the ERWP may be bypassed. Approval of the RPD or ED is required and the ERWP must be completed as soon after the entry as possible.

5.1.4 For any entry where an exposure greater than 10 CFR 20 limits is likely, an Authorization For Increased Exposure (Form AD-11.3) must be completed.

NOTE: For the purposes of emergency repair/operation, personnel will not be allowed to receive a dose exceeding 25 REM to the whole body.

5.2 Emergency Entry Team

5.2.1 An Emergency Entry Team shall be formed for entries into highly radioactive or contaminated areas for the purpose of search and rescue on life saving missions.

5.2.2 The RPD shall designate an Entry Team Coordinator.

5.2.3 Communications will be maintained via two-way radios between the Entry Team Coordinator and the In-Plant RET.

5.2.4 Only self-contained pressure demand respiratory equipment shall be used for worker protection during emergency entries.

5.2.5 Each team shall be briefed prior to entry. The briefings shall cover: purpose of the mission; exposure limits; work methods for reduced exposures; conditions expected to be encountered; abort instructions; stay times; personal dosimeter monitoring; respiratory protection equipment and anti-C clothing requirements.

5.3 Radiological Protection Director

5.3.1 Any exposure to radiation in excess of 10 CFR Part 20 limits shall be authorized by the RPD with the concurrence of the ED (Form AD-11.3). In the absence of the RPD, the ED may authorize an overexposure directly after concurring with the on-shift HP or an In-plant RET member.

5.3.2 The RPD will inform personnel of the availability of thyroid blocking agents (Potassium Iodide) for use in accordance with EP-AD-18.

5.3.3 ERWP's must be reviewed and approved by the RPD.

5.4 In-plant Radiation Emergency Team

5.4.1 All inplant radiological conditions will be reported to the Radiological Protection Director.

5.4.2 The RET will make radiological assessments of all inplant areas requiring access and occupation during an emergency.

5.4.3 The projected amount of time inplant emergency workers will be allowed to stay in a radiation and/or contaminated area shall be determined in accordance with Stay Time (Form AD-11.2) and shall include a review of:

a. Projected route exposures
b. Measured dose rates and airborne concentrations
c. Personnel exposure history
d. Projected duration of task
e. Information on current plant conditions and the plant area under consideration

5.4.4 Continous radiation monitoring coverage will be provided in occupied areas when the potential for increased radiation levels exist and the area is occupied.

5.4.5 Radiation surveys need not be performed in areas of extremely high radiation levels. Rather, surveys should be performed only if entry into these areas is required for other emergency actions.

5.4.6 Air sample surveys and radiological assessment surveys shall be completed depending on the nature and seriousness of the emergency.

5.4.7 For all entries into a Radiation Hazard area, exposures to airborne concentrations of radioactivity shall be limited by the following:

a. Whenever practicable, total exposure of any individual during an emergency should be limited to 40 MPC-hours. MPC hours are calculated by multiplying the concentration in terms of the number of MPC's by the total time of exposure (in hours).

b. If emergency operations demand, total exposure of any individual shall be limited to 1,200 MPC-hours. This is roughly equivalent to the 3 Rem/quarter limit for external radiation exposure.

c. Limits for exposure to Xe-133 and other noble gases are based on beta plus gamma dose limits to the skin and whole body.

d. An integrated exposure of 10,000 MPC-hours for nuclides with short effective half-lives is roughly equivalent to an external, whole-body exposure of 25 Rem and should be received only with the approval of the Radiological Protection Director or Emergency Director. Similar exposure to nuclides with long effective half-lives are to be avoided and should be restricted to 1,200 MPC-hours as in b above.

e. Since the effects of external and internal exposure are additive, personnel should avoid exposures over 1,200 MPC-hours, even in the event of life-saving or rescue action, unless external radiation fields are minimal and unless effective half-lives are short.

f. Personnel who have been exposed to more than 10,000 MPC-hours shall be removed from further emergency duty, whole body counted, and referred to a physician for attention.

5.4.8 For all special entries the RET shall review with the team members the task to be performed including the following where applicable.

a. Potential stress conditions and problems
b. Work methods
c. Number of personnel required
d. Allowable exposure limits
e. Tools, equipment, and parts
f. Lighting
g. Communications requirements

5.4.9 A Radiation Emergency Team Member shall accompany any personnel entering any radiation or contaminated area where radiological conditions are unknown.

5.4.10 Any individual who has exceeded 10 CFR 20 limits shall be temporarily removed from radiation exposure work. His exposure record shall be reviewed by the RPD and ED prior to further radiation work.

WISCONSIN PUBLIC SERVICE CORPORATION
KEWAUNEE NUCLEAR POWER PLANT

Form 145-49-1

EP-AD-11
JUN 21 1983

Form AD-11.1

EMERGENCY
RADIATION WORK PERMIT

Number: E- _____ Associated Work Number _____ Date Prepared: _____

☐ REGULAR _____ ☐ EXTENDED _____ EFFECTIVE: _____ through _____

TO BE COMPLETED BY WORK SUPERVISOR: (Attach Work Request if available)

Job Location and Description: _____

ASSIGNED WORKERS	EXP. LIMIT	TOTAL REC'D	ASSIGNED WORKERS	EXP. LIMIT	TOTAL REC'D

TO BE COMPLETED BY HEALTH PHYSICS:

General Area Radiation: _____ Instrument Used: _____

Contamination Levels: _____ **HP Coverage Req. YES/NO _____

Airborne Activity: _____ Surveyed By: _____

INDIVIDUAL REQUIREMENTS: (Circle Required Items)

Dosimetry:	TLD Badge	Dosimeter	Wrist Badge	Finger Badge
Protective Clothing:	Labcoat	Skullcap/Hood	Liners	Rubber Gloves
	Coveralls Plastic Boots	Plastic Suit	Plastic Hood	Rubber Overshoes

Other: _____

SPECIAL INSTRUCTIONS: _____

APPROVAL

Work Supervisor: _____

RADIOLOGICAL PROTECTION DIRECTOR _____

EMERGENCY DIRECTOR _____

TERMINATION

By: _____

Date/Time: _____

Reason: _____

ADDITIONAL: OverExposure Authorization

Predicted Exposure _____

_____

Rad Protection Director _____

Emergency Director _____

An Airborne Exposure Analysis must be completed for each assigned worker following exit from an Airborne Contaminated area (Form AD-11.2)

WHITE COPY – – – – Monitor Room

PINK COPY – – – – Job Location

Time: _____
Date: _____
Location: _____

Airborne Exposure Analysis

Emergency Radiation Work Permit (Page 2 of 2)

ISOTOPE	$t_{1/2}$	OBSERVED CONCEN.	OCCUPATIONAL MPC	RATIO CONC./MPC	REG. NO.	BODY BURDEN 30 MINUTE EXPOSURE
Ar-41	1.827 h		2 E-6		1	
Kr-85	10.720 y		1 E-5		2	
Kr-85m	4.480 h		6 E-6		3	
Kr-87	76.300 m		1 E-6		4	
Kr-88	2.840 h		1 E-6		5	
Xe-133	5.245 d		1 E-5		6	
Xe-133m	2.190 d		1 E-5		7	
Xe-135	9.110 h		4 E-6		8	
Xe-135m	15.360 m		1 E-6		9	
Xe-138	14.130 m		1 E-6		10	
PARTICULATES: Less than 8 day $t_{1/2}$						
Na-24	15.000 h		1 E-6		11	
Mn-56	2.578 h		5 E-7		12	
Rb-88	17.800 m		1 E-6		13	
Sr-92	2.710 h		4 E-7		14	
Mo-99	66.020 h		2 E-7		15	
Te-132	78.200 h		2 E-7		16	
Cs-138	32.200 m		1 E-6		17	
La-140	40.220 h		2 E-7		18	
PARTICULATES: Greater than 8 day $t_{1/2}$						
Cr-51	27.704 d		2 E-6		19	
Mn-54	312.700 d		4 E-8		20	
Co-58	70.800 d		5 E-8		21	
Fe-59	44.630 d		5 E-8		22	
Co-60	5.271 y		9 E-9		23	
Zn-65	244.400 d		6 E-8		24	
Nb-95	35.060 d		1 E-7		25	
Zr-95	64.020 d		3 E-8		26	
Cs-134	2.062 y		4 E-8		27	
Cs-136	13.160 d		4 E-7		28	
Cs-137	30.170 y		6 E-8		29	
Ba-140	12.789 d		1 E-7		30	
Ce-144	284.300 d		1 E-8		31	
HALOGENS						
F-18	109.740 m		5 E-6		32	
Br-84	31.800 m		1 E-6		33	
I-131	8.040 d		9 E-9		34	
I-132	2.300 h		2 E-7		35	
I-133	20.800 h		3 E-8		36	
I-134	52.600 m		5 E-7		37	
I-135	6.610 h		1 E-7		38	
TRITIUM	12.280 y		2 E-3		39	
Sr-90	28.600 y		1 E-9		40	

STAY TIME CALCULATION: (based on a 40hr week) TOTAL: _____

WORKER NAME: _____
TIME IN TIME OUT

40 hrs / TOTAL = _____ (hrs/week) STAY TIME x 60 = _____ (min./week) STAY TIME

MPC-HOUR CALCULATION: $\frac{\text{TOTAL}}{\text{RESPIRATOR PROTECTION FACTOR}} \times \frac{\text{EXPOSURE TIME IN MINUTES}}{\text{HR (60 MIN)}} = \left(\frac{\quad}{\quad}\right)\left(\frac{\quad}{\quad}\right)\frac{\text{HR}}{\text{(60 MIN)}}$ = MPC-HOURS RECEIVED

FORM AD-11.3

WISCONSIN PUBLIC SERVICE CORPORATION

KEWAUNEE NUCLEAR POWER PLANT

AUTHORIZATION FOR EMERGENCY RADIATION EXPOSURE

DATE: _____

Name: _____ Social Security No.: _____

Employer: _____ Date of Birth: _____

Reason for Emergency Exposure: _____

_____

Requested by: _____ Title: _____

_____

Present Exposure Limit is ..... _____ REM

Increased Exposure Limit Will Be ..... _____ REM

Total Lifetime Exposure at Start of this Quarter was ..... _____ REM

Accumulated Exposure for this Quarter is ..... _____ REM

Total Lifetime Exposure to date is ..... _____ REM

5(N-18) Limit is ..... _____ REM

Unused Lifetime Exposure Remaining is ..... _____ REM

Form NRC-4 up-to-date? ..... Yes _____ No _____

NOTE: Environmental Protection Agency guidance states that emergency worker exposures should be limited to 25 REM for emergency repair/operation. This limit may be exceeded for life saving operations.

"I agree that I have not previously received a once in a lifetime dose of 25 REM and that my radiation exposure limit can be increased."

Signed: _____

Approved by Radiological Protection Director: _____

Emergency Director: _____

WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEDURE	NO. EP-ENV-3A REV. H TITLE: Environmental Protection Director Actions and Directives DATE: JUN 2 1 1983 PAGE 1 of 17
REVIEWED BY [signature]	APPROVED BY [signature]

1.0 APPLICABILITY

Upon the classification of an incident as a Site or General Emergency, or during an Alert if conditions warrant, the Environmental Protection Director (EPD) will execute this procedure.

2.0 PRECAUTIONS

2.1 Projected dose rates, concentrations and meteorological conditions must be known prior to dispatching the Environmental Monitoring Teams (EM Teams).

2.2 Ensure proper protective actions are taken for the Environmental Monitoring Team members prior to dispatch.

2.3 Utilize the Field Map with Plexiglass Cover in recording field results.

3.0 REFERENCES

3.1 EP-AD-11, Emergency Radiation Controls

3.2 EP-RET-2, Inplant Radiation Emergency Team

4.0 DIRECTIONS

Environmental Protection Director

4.1 If notified by pager, confirm contact with a telephone call to the control room at

4.2 If informed of EOF activation by the ERM:

a. Notify members of the Environmental Monitoring Team per Form ENV-3A.1.

NOTE: If unable to contact a sufficient number of personnel from the group by using home or office telephone numbers, activate the pager system per attached Table ENV-3A.2 or call System Operating at and provide your name and title and the names and titles of the individuals you wish to page. Also provide a brief (20 seconds) message to be broadcast over the pagers. System Operating personnel will attempt to contact these individuals via the paging system.

b. Proceed to the EOF.

4.3 Perform dose projection calculation via EP-ENV-3C, Primary Dose Projection Calculation - IBM Personal Computer and EP-ENV-3D, Primary Determination of Meteorological Data.

NOTE: If the IBM Personal Computer is not available for use, refer to to EP-RET-5 and EP-RET-6.

NOTE: If the WPS IBM Computer is not available for use, refer to EP-ENV-3E, Manual Determination of X/Q-KNPP Meteorological Data; EP-ENV-3F, Manual Determination of XQ/-Green Bay Meteorological Data; and EP-ENV-3G, Manual Dose Projection Calculations as are appropriate.

4.4 Determine Protective Actions needed via EP-ENV-3G, Protective Action Recommendation Determinations.

NOTE: See Decision Flow Chart, Figure 3A.1.

4.5 Maintain a log of all significant events reported and directed.

5.0 PERSONNEL DISPATCH

5.1 Evaluate the radiological consequences in consultation with the Radiological Protection Director (RPD) from the above data and advise Environmental Monitoring Teams accordingly of the appropriate protective actions.

5.2 Dispatch Environmental Monitoring Teams, via the Environmental Monitoring Team Coordinator, to the projected plume path as follows:

NOTE: As Form ENV-3A.2 is initiated for Tracking EM Team Sampling, record Dose Projections (ENV-3C or 3G) for the sample points on the form.

5.2.1 Dispatch EM teams to predetermined sample points, TABLE ENV-3A, near the projected plume edges. Spacing the teams to define the plume shape and characteristics.

NOTE: If lake breeze effect exists as determined in Form ENV-3D.2, 3E.3 or 3F.3 refer to step 6.0 for guidance in directing environmental monitoring teams.

5.2.2 Observe caution when sending EM teams into a plume, especially to point near the centerline.

5.2.3 After the plant has discontinued releases, continue tracking the plume to the perimeter of the EPZ.

5.2.4 Record sampling results and locations on Form ENV-3A.2, using Base Map sector designate and predetermined sample location number.

EXAMPLE: Log: Sector "A" at "point 122"

5.3 Record the following data for each environmental sample location on Form ENV-3A, when received from EMT Coordinator.

5.3.1 Date and Time results received.

5.3.2 Direct radiation readings.

5.3.3 Particulate activity.

5.3.4 I-131 concentration.

5.3.5 Noble gas concentration.

5.4 Mark the most recent results on the plexiglass covered field maps.

5.5 Transmit the most current data recorded on the field maps to the Technical Support Center Director.

5.6 Redirect the Environmental Monitoring Teams to take subsequent samples as necessary.

5.7 Transmit the measured data, and any plume track changes, to the Radiological Protection Director promptly.

NOTE: Meteorological conditions should be checked periodically.

5.8 Direct the Environmental Monitoring Team Coordinator to take appropriate precautions for the collection of samples and the storage of all environmental samples obtained at the Site Access Facility.

5.9 Continue to update plume path sample results on the Field Map as results are reported.

5.10 Transmit results and recommendations to the Emergency Response Manager.

5.11 Keep the SAF and EM team informed on plant conditions.

6.0 EFFECT OF LAKE BREEZE ON PROJECTED EXPOSURES

6.1 Actual dose rates west of the Lake Breeze "front" (where the lake breeze meets the prevailing wind) will be lower than projected.

6.2 Exposure from the plume may occur in areas not encompassed by the X/Q or Xu/Q overlays since the plume is directed back toward the lake in the direction of the prevailing wind.

6.3 Monitoring Considerations

Figure ENV-3A.2 shows a method for determining the location of the Lake Breeze front. Following the guidelines below and Figure ENV-3A.2 will aid in determining the radiological effects of the lake breeze on the plume track.

6.3.1 One team should be sent to the predicted lake breeze front position via the plume edge downwind of the prevailing wind. The team should then begin searching for the lake breeze front to verify the predicted lake breeze position. Once discovered the team should be sent downwind of the projected plume with respect to the prevailing wind. The objective is to look for radiation or plume recirculation in the lake breeze.

6.3.2 The other team should sample the plume between the lake shore and the lake breeze front.

FIGURE ENV-3A.1
DECISION FLOW CHART

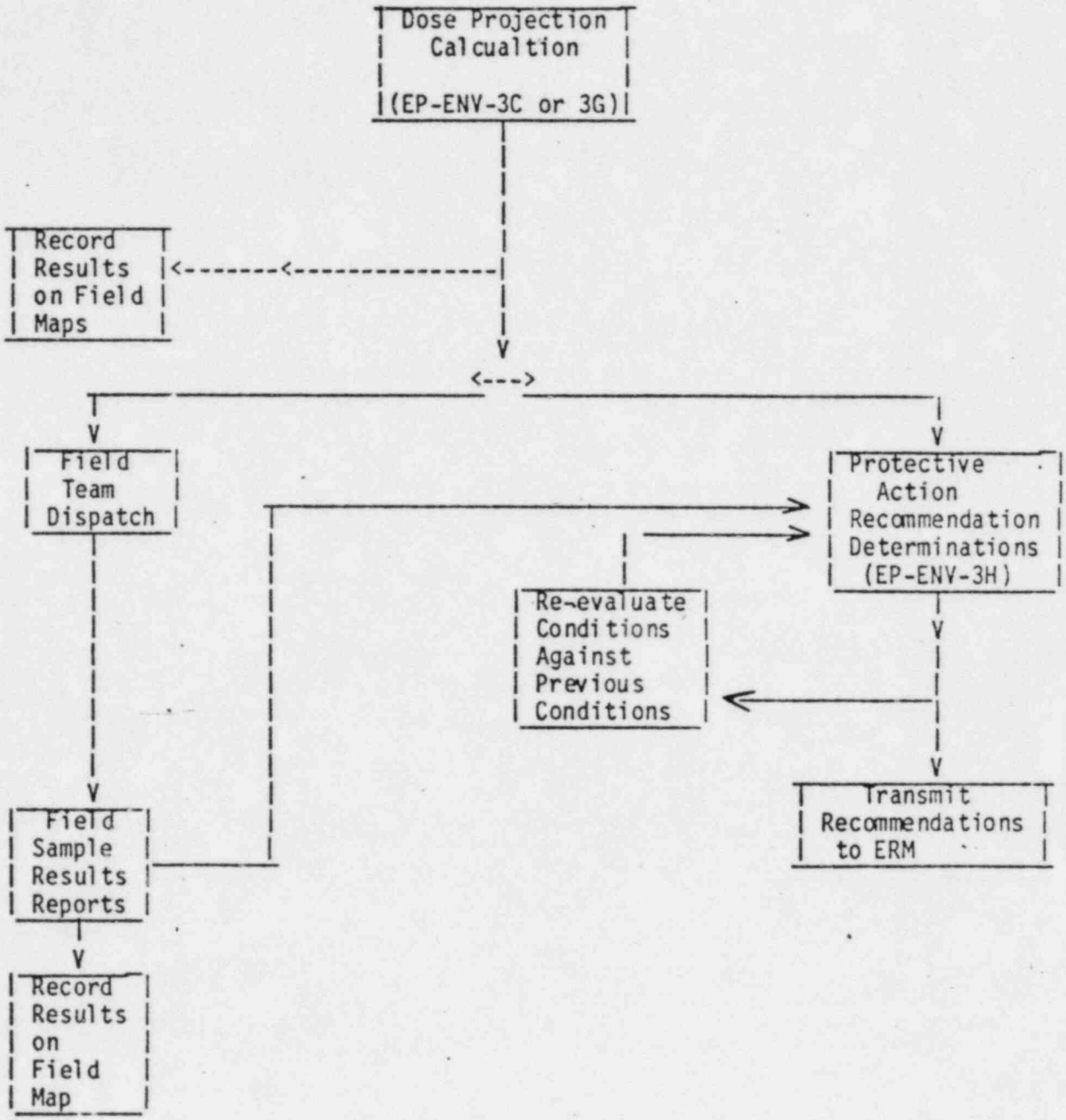
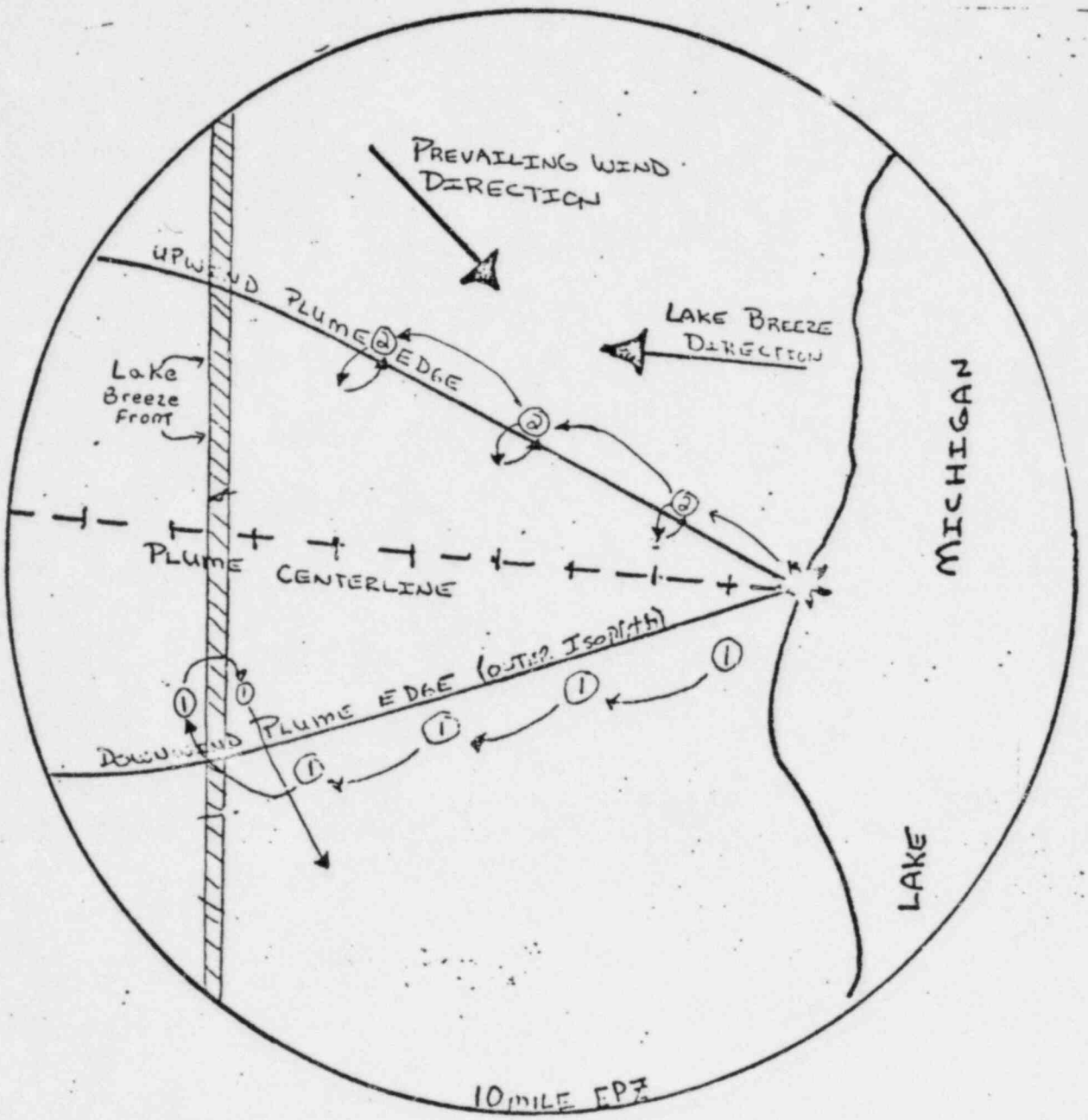


FIGURE ENV-3A.2

LAKE BREEZE EFFECTS DIAGRAM



1. Team Dispatched to Sample lake breeze front and retrun flow.
2. Team Dispatched to Sample plume between plant and lake breeze front.

NOTE: This Drawing is for Illustration Only.
The Actual sampling points are designated by the Environmental Protection Director.

FORM ENV-3A.1

TIME	INITIALS	NAME	OFFICE #	HOME #	PAGER

FORM ENV-3A.2

RADIOLOGICAL ENVIRONMENTAL MONITORING AND SAMPLING WORKSHEET

Location: Point Number/ Road Name	DATE	TIME	Direct Radiation		Particulate Activity (uCi/cc)	Iodine (131) (uCi/cc)	Noble Gas Sample Delivered (Yes/No)	Dose Projection		Field Sample Dose Calculations	
			OP. WIN. (mR/hr)	CL. WIN. (mR/hr)				Whole Body (REM)	Thyroid (REM)	Whole Body (REM)	Thyroid (REM)

TABLE ENV-3A.1

TLD MONITORING AND SAMPLING LOCATIONS
(1 of 7)

1. Lake Shore Rd (M) 1/4 mile north of Zander Rd
2. Lake Shore Rd (M) 1/4 mile south of Two Creeks Rd
3. Hwy 42 1/4 mile North of Two Creeks Rd Intersection
4. Two Creeks Rd 3/4 mile west of Hwy 42, 1/4 mile N. on Blaha Road
5. County BBB and County BB Intersection
6. County BBB 1/2 mile south of BB
7. 3/4 mile west and 1/2 mile south of County Hwys. BB and BBB inersection (trailer park)
8. County BB 1/4 mile east of Saxonburg Rd
9. County BB 1/2 mile east of State Hwy 163
10. County B 1/4 mile north of Zander Rd
11. Saxonburg Rd 1/2 mile north of Zander Rd
12. Two Creeks Rd 1/2 mile west of Saxonburg Rd
13. Two Creeks Rd 1/4 mile east of State Hwy 163
14. Two Creeks Rd 1/2 mile east of Saxonburg Rd
15. Tannery Rd 3/4 mile north of Tappawingo Rd
16. Access Rd off of Tappawingo Rd 1/4 mile eas of Tannery Rd
17. Tappawingo Rd 3/4 mile west of Tannery Rd
18. Tappawingo Rd 1/4 mile west of Saxonburg Rd
19. Tappawingo Rd 1/4 mile west of State Hwy 163
20. Tappawingo rd and Jambo Creek Rd Intersection
21. Jambo Creek Rd 1/4 mile north of Holmes Rd
22. County Hwy BB 1/2 mile west of State Hwy 163
23. Lakeshore Rd (M) 1/4 mile north of Nuclear Rd (M)
24. Nuclear Rd (M) 1/2 mile eas of State Hwy 42

(K) - Kewaunee County
(M) - Manitowoc County

TABLE ENV-3A.1 (cont'd)
(2 of 7)

25. Lakeshore Rd (M) and Nuclear Rd (M) Intersection
26. Irish Rd 1/4 mile east of Meyer Rd
27. State Hwy 177 1/4 mile west of County Hwy. O
28. Elmwood Rd and Ravine Rd Intersection
29. Tannery Rd 1/4 mile north of Elmwood Rd
30. 1/4 mile east of County Hwy V and State Hwy 42 Intersection
31. State Hwy 42 1/2 mile north of Irish Rd
32. Benzinger Rd 1/4 mile west of Tannery Road
33. County Hwy V and Saxonburg Rd Intersection
34. Corners Rd and Division Dr. Intersection
35. State Hwy 42 1/4 mile north of Rawley Rd
36. South entrance road to Point Beach State Park, 1/4 mile east of County Hwy. O
37. Nuclear (M) 3/4 mile west of Tannery Rd
38. 1/4 mile south and 1/4 mile west of Saxonburg Rd and Nuclear Rd (M) Intersection
39. Tappawingo Rd 0.1 mile east of State Hwy 42
40. State Hwy 163 and State Hwy 147 Intersection
41. Prince Rd 1/4 mile north of Rockledge Rd
42. Jambo Creek Rd 1/4 mile north of Rockledge Rd
43. County Hwy Q and Intersection with Factory Rd
44. County Hwy Q 1/4 mile north of Zander Rd
45. County Hwy BB 0.4 mile east of Harpt Lake Rd
46. Nuclear Rd (K) 0.4 mile west of State Hwy 42
47. Nuclear Rd (K) 1/2 mile west of Hwy 42
48. County Hwy BB and state Hwy 42 Intersection
49. German Lane 1/4 mile west of State Hwy. 42

(K) - Kewaunee County
(M) - Manitowoc County

TABLE ENV-3A.1 (cont'd)
(3 of 7)

50. State Hwy 42 1/4 mile south of Nuclear Rd (K)
51. State Hwy 42 and Nuclear Rd (K) Intersection
52. State Hwy 42 and Nuclear Rd (K) Intersection
53. State Hwy 42 and Intersection of Nuclear Rd (K)
54. State Hwy 42 0.4 mile north of Nuclear Rd (K)
55. State Hwy 42 1/4 mile south of Sandy Bay Rd
56. State Hwy 42 and Intersection of Sandy Bay Rd
57. Sandy Bay Rd and Intersection of Cemetary Rd
58. Cemetary Rd 1/4 mile north of Sandy Bay Rd.
59. Lake shore Rd (K) and Interection of Cemetary Rd
60. Lake Shore Rd (K) 1/2 mile east of State Hwy 42
61. Lake Shore Rd (K) and State Hwy 42 Intersection
62. Lake Shore Rd (K) 1/2 mile west of State Hwy 42
63. Sandy Bay Rd 1/2 mile west of State Hwy 42
64. Sandy Bay Rd and Intersection of Woodside Rd
65. Woodside Rd 1/2 mile north of Nuclear Rd (K)
66. Woodside Rd and Intersection of Nuclear Rd (K)
67. Woodside Rd 1/4 mile south of Nuclear Rd (K)
68. Woodside Rd 3/4 mile north of County Hwy BB
69. Town Hall Rd 1/4 mile north of County Hwy BB
70. Town Hall Rd 1/4 mile north of Nuclear Rd (K)
71. Town Hall Rd 3/8 mile south of Sandy Bay Rd
72. Town Hall Rd 1/2 mile south of County Hwy G
73. County Hwy G 1/2 mile east of town Hall Rd

(K) - Kewaunee County
(M) - Manitowoc County

TABLE ENV-3A.1 (cont'd)
(4 of 7)

74. Woodside Rd and County Road G Intersection
75. Old Settlers Rd and Cemetary Rd Intersection
76. Old Settlers Rd and Hwy 42 Intersections
77. Old Settlers Rd 1/4 mile east of Woodside Rd
78. Woodside Rd. 1/2 mile south of Old Settlers Road
79. Old Settlers Rd. and Town Hall Road Intersection
80. Norman Road 1/4 mile north of County Hwy. G
81. County Hwy B 1/4 mile west of Norman Rd
82. Saint Peters Rd 1/4 mile north of Old Settlers Rd
83. Wochos Rd and intersection of Old settlers Rd
84. North Intersection of Range Line Rd and County Hwy G
85. County Hwy B 1/4 mile north of County Hwy G
86. Norman Rd 1/4 mile north of Sandy Bay Rd
87. Sandy Bay Rd and Intersection of Saint Peters Rd
88. County Hwy B 1/2 mile south of Sandy Bay Rd
89. Nuclear Rd (K) 1/2 mile east of Range Line Rd
90. Nuclear Rd (K) and Norman Rd Intersection
91. Norman Rd 1/4 mile north of County Hwy BB
92. County Hwy B 1/4 mile north of County hwy BB
93. Range Line Rd 1/4 mile north of County hwy BB
94. Collegiate Rd 1/2 mile west of Range Line Rd
95. State Hwy 163 1/4 mile west of Sleepy Hollow Rd
96. Bolt Rd and County Hwy Q intersection
97. Bolt Rd 1/4 mile west of Collegiate Rd
98. Knutson Rd and State Hwy 96 Intersection
99. Manitowoc Rd and Langes Corners Rd Intersection

(K) - Kewaunee County (M) - Manitowoc County

TABLE ENV-3A.1 (cont'd)
(5 of 7)

100. State Hwy 163 1/4 mile south of Old Settlers Rd
101. County Hwy J 1/4 mile west of State Hwy 163
102. Sleepy Hollow Rd and Kassner Rd Intersection.
103. Church Rd 1/2 mile north of County Hwy J
104. Saint Peters Rd and Town Line Rd Intersections
105. County hwy B 1/4 mile South of County Hwy J
106. County Hwy J 1/4 mile west of Town Hall Rd
107. Town Hall Rd and Town Line Rd Intersections
108. Town Line Rd 1/2 mile west of Woodside Rd
109. Town Line Rd and State Hwy 42 Intersection
110. Town Line Rd 0.3 mile east of Mile Rd
111. Lake Rd 1/2 mile east of State Hwy 42
112. County hwy J 1/2 mile west of State Hwy 42
113. County hwy J 1/2 mile east of Town Hall Rd
114. Krok Rd 1/4 mile west of Sleepy Hollow Rd
115. Krok Rd 1/4 mile west of Church Rd
116. Krok Rd 1/4 mile east of Saint Peters Rd
117. 1/4 mile south of Angle Rd and Krok Rd Intersections
118. State Hwy 42 1/4 mile south of Hospital Rd
119. State Hwy 42 3/4 mile south of County hwy F
120. County Hwy C 1/2 mle west of Kewaunee City
121. County Hwy C 1/2 mile north of County Hwy F
122. Birchwood Rd and County Hwy F Intersection
123. Lilac Lane 1/4 mile north of County F

(K) - Kewaunee County
(M) - Manitowoc County

TABLE ENV-3A.1 (cont'd)
(6 of 7)

124. State Hwy 29 and County hwy B Intersection
125. Church Rd 1/4 mile north of State Hwy 29
126. Town Hall Rd 1/2 mile south of State Hwy 29
127. Angle Rd 1/4 mile south of State Hwy 29
128. Hospital Rd 3/4 mile north of State Hwy 42
129. East end of Krok Rd, along the Lakeshore
130. Old Settlers Rd 1/2 mile east of Twon Hall Rd
131. 1204 Milwaukee St., Kewaunee
132. County Hwy. O, 1 1/2 miles south of County Hwy. VV
133. Lake Shore Rd 1/2 mile north of Kewaunee City
134. Lakeshore Rd (K) 1/2 mile north of First Road (Barnett Sub.)
135. County Hwy F 1 1/4 miles west of State Hwy 42
136. Maple Lane 1/2 mile west of County Hwy C
137. Church Rd and Town Line Rd Intersection (northeast of Ellisville)
138. Sleepy Hollow Rd 1/4 mile north of Hwy 29
139. Reckelberg Rd 1/4 mile south of Krok Rd
140. Schweiner Rd 1/2 mile south of County hwy J
141. Schultz Rd and State Hwy 96
142. Lyons Rd 1/4 mile southof Zander Rd
143. County hwy Q 1/4 mile north of State Hwy 147
144. Fisherville Rd and Cherney Rd Intersection
145. Steiners Corners Rd. 1/2 mile west of State Hwy. 147

(K) - Kewaunee County

(M) - Manitowoc County

TABLE ENV-3A.1 (cont'd)
(7 of 7)

146. Meadow Dr. 1/4 mile north of E. Hillcrest Rd.

147. County Hwy. O 1/2 mile south of County Hwy. VV

148. Coast Guard Station, Two Rivers

149. WPS Operations Building, Two Rivers

150. City Hall Roof, Manitowoc

Table ENV-3A.2
PAGING SYSTEM OPERATION

A.1 Tone and Voice Radio Pagers are assigned to personnel as shown with call numbers on the Emergency Call List. (See EP-AD-17).

A.2 Whenever it is necessary to contact a person on the Emergency Call List and he is not on site, the home telephone number should be called first. If he cannot be reached at home, contact should then be attempted by using the person's individual call number. A group of individuals may be contacted by using the group call number. Tone and voice contact by pagers is effective within a 15 mile radius of the transmitting station. Only tone contacts can be made outside the 15 mile radius.

A.3 How to Place a Page

3.1 Determine the two digit pager code for the party or group you wish to contact from the pager assignment list.

PLANT EXTENSION PHONES

3.2 Dial the terminal access code on any plant extension.

Kewaunee site transmitter -

Green Bay transmitter -

a. When the terminal answers and responds with a beep, go to step 3.3.

b. If you near a "busy" signal, hang up and try again.

3.3 Dial the two digit pager code for the party or group you wish to contact from the pager assignment list.

NOTE: This number must be preceded by a "1" when using the Green Bay transmitter.

3.4 Listen for the acknowledge (beeping) tone, indicating page being transmitted.

3.5 When the beeping tone stops, speak your message to the called party. You have about 20 seconds to talk. A "click" signals that your allotted time has expired.

TABLE ENV-3A.2 (cont'd)

GREEN BAY EXTENSION PHONES

3.6 Dial:

a. For Kewaunee site transmitter -

b. For Green Bay transmitter -

3.7 When the terminal answers and responds with a beep, go to step 3.8.

a. If you hear a "busy" signal, hang up and try again.

3.8 Dial the two digit pager code for the party or group you wish to contact from the pager assignment list.

NOTE: This number must be preceded by a "1" when using the Green Bay transmitter.

3.9 Listen for the acknowledge (beeping) tone, indicating page being transmitted.

3.10 When the beeping tone stops, speak your message to the called party. You have about 20 seconds to talk. A "click" signals that your allotted time has expired.

WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEDURE	NO. EP-ENV-3B REV. E TITLE: EM Team Actions DATE: JUN 2 1 1983 PAGE 1 of 8
REVIEWED BY M L Marchi D H Hess	APPROVED BY C L Terpstra

1.0 APPLICABILITY

In the event of a Site or General Emergency, Environmental Monitoring Team (EMT) Members will be activated. The Emergency Response Manager (ERM) or Emergency Director may activate the team during an Alert if conditions warrant.

2.0 PRECAUTIONS

2.1 Check to see if all equipment is operational prior to use in the field.

2.2 Ensure all protective clothing/devices are inspected for damage prior to use.

3.0 REFERENCES

3.1 EP-ENV-2, SAF Activation

3.2 EP-ENV-7, Site Access Facility Communications

4.0 INSTRUCTIONS

4.1 EMT Coordinator Actions

4.1.1 Upon pager activation or notification of EOF activation, report to the Site Access Facility (SAF) and assume the responsibility of coordinating the environmental monitoring teams.

4.1.2 Establish a communications link with the Emergency Operations Facility (EOF) or the Radiation Protection Office/Radiological Analysis Facility (RPO/RAF) per EP-ENV-7, Site Access Facility Communications.

4.1.3 Establish EM Teams as personnel arrive at SAF and give them each a letter (i.e. A,B,) designation for radio communication purposes. Inform the Environmental Protection Director (EPD) of the designations of the EM Teams.

4.1.4 Direct EM Teams to assemble the needed equipment for the appropriate type of field monitoring assigned the team.

4.1.5 Ensure each Environmental Monitoring Team has the following equipment:

a. Respirator for each team member

b. Anti-contamination clothing

c. Dosimetry (high and low range pocket dosimeters and TLD's)

d. Hand held radiation detection equipment

4.1.6 Ensure that each team has the equipment specified for the EMT kit (Table ENV-3B).

4.1.7 Report to the EPD when a team is available and ready for assignment.

4.1.8 Upon order from the EPD, direct the designated teams to the appropriate sample locations and inform them of the type and quantity of samples to be obtained.

4.1.9 Maintain Radio Contact with the EM Teams at all times

NOTE: Contact should be made every 15 minutes.

4.1.10 Track the EM Teams locations on the Field Map and record sample times and locations using Form ENV-3B.2.

4.1.11 Periodically request radiological condition updates from EPD and pass this information to the field teams.

4.1.12 Have the EM Teams report their pocket dosimeter readings during communication contacts.

4.1.13 Record EM Team Member's pocket dosimeter readings on Form ENV-3B.1.

4.1.14 Verify operability of counting equipment has been completed per EP-ENV-5A, B and C (Counting Equipment Operating Procedures) and if not, perform applicable checks.

a. Commence counting samples on the appropriate analytical instrument as soon as field samples return.

b. Log results on the applicable Counting System Worksheet, and sample activities in the appropriate columns of the Radiological Environmental Monitoring and Sampling Worksheet, Form ENV-3B.2.

4.1.15 Report sample analysis results to the EPD.

NOTE: Repeat all communications transmitted, to assure accurate transmission of data.

4.1.16 As EM Teams return, direct the team members to resupply their equipment and await further direction.

NOTE: Ensure they have performed appropriate personnel frisking for contamination.

4.1.17 At all times keep the EPD informed of EM Teams availability.

4.2 EM Team Actions

4.2.1 Report to the SAF and assume the responsibilities for conducting environmental monitoring.

4.2.2 Obtain personnel TLD and High and Low Range Pocket Dosimeters.

4.2.3 Assemble proper equipment and check for satisfactory operation in accordance with EP-ENV-4A, B, and C; Sample Acquisition Procedures.

4.2.4 When equipment is assembled and operation checks have been completed, report to the EMT Coordinator for direction and assignment.

4.2.5 Perform the following upon assignment from the EMT Coordinator:

a. Load equipment into the designated vehicle.

b. Check communications with EMT Coordinator by contacting the SAF:

1. Approximately every 15 minutes,

2. Any time that an increase of 4 times general area radiation reading is found,

3. Any time there is any confusion as to the dispatch order or whenever clarifying information is needed.

c. Proceed to the designated area, obtaining general area radiation readings during transit and record readings in Log Book as well as reading location.

d. Report to SAF by radio upon arrival at the designated monitoring site.

e. Acquire the samples and readings as directed by the EMT Coordinator, in accordance with EP-ENV-4A, B, and C, Sample Acquisition Procedures.

NOTE: Beta/Gamma measurements for the purpose of Plume Tracking should be made over an approximately 30 second time span at approximately 3 to 4 feet above the ground. In the same location measurements at approximately 6 inches above the ground should be taken. If the 6 inch reading is lower in magnitude than the 4 foot measurement, the assumption should be that the predominant radiation source is the airborne Plume, and this should be noted and reported to the SAF (EMT Coordinator).

f. Maintain accurate records of samples taken and the time acquired.

g. When all samples have been collected, contact SAF by radio, and report completion. If no further samples are ordered at the present location, request direction from the EM Team Coordinator.

4.2.6 Upon return to the SAF, perform the following steps:

a. Take collected samples to SAF monitoring station before transporting to counting room.

b. Decontamination instructions, if necessary, should be obtained from site RET Member.

NOTE: Care must be taken to prevent contaminating the entire SAF Area when teams return to SAF from the field.

4.2.7 Replenish supplies.

4.2.8 Report to the EM Team coordinator when ready for redeployment.

FORM ENV-3B.1

EM TEAM DOSIMETER READING TRACKING LOG

DATE: _____

NAME	TEAM CODE	DOSIMETER SERIAL NO.	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING

FORM ENV-3B.2

EM TEAM DOSIMETER READING TRACKING LOG

DATE: _____

NAME	TEAM CODE	DOSIMETER SERIAL NO.	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING	TIME READING

TABLE ENV-3B

SAF E M TEAM KIT

		INITIALS
*	1 PRM 7 uR meter	____
*	1 PIC 6A ion chamber	____
*	1 E530 with HP-190 probe & survey tube	____
*	1 RAP-1 Lo Volume Sampler	____
*	1 RAP-1 Sample Jumper	____
*	1 Staplex Hi Vol Sampler	____
*	1 Hi Band Two-way Radio	____
*	1 Emergency Generator	____
	1 Flashlight with Batteries	____
*	2 Full-face Masks with Particulate Cartridges	____
	1 Stopwatch (Pocket Watch)	____
	1 Calculator	____
	4 Marinelli Beakers in Plastic Bags	____
	12 Silver Zeolite Cartridges	____
	12 4" Particulate Filters	____
	12 2" Particulate Filters	____
	4 1 liter wide mouth poly bottles filled with water	____
	1 Pkg Swipes	____
	1 Pkg Sample Labels	____
	4 Garden Trowels	____
	3 Grass clippers	____
	1 6' Measuring Tape	____
	4 Funnels	____
	4 Ladles	____

TABLE ENV-3B (cont'd)

SAF E M TEAM KIT

	INITIALS
2 dz Small Ziplok Bags 10" x 12"	
2 dz poly bags 12" x 18", Clear	
3 Tweezers	
1 Reflective Vests	
4 Poly Bags, 33" x 40", yellow	
1 Set EMT Area Maps (large sector map)	
2 Clipboards	
1 Set Pens & Pencils	
12 pr Gloves & Liners	
6 pr Canvas Booties	
1 roll Tuck Tape	
1 book of ENV Procedures and Spare Forms (EP-ENV-1, 2, 3B, 4A, 4B, 4C, 5E & 7)	

* NOT LOCATED IN SEALED TRUNK

1.0 APPLICABILITY

This procedure will be utilized by the Environmental Protection Director during any incident that involves a significant release of radioactive materials to the environment, for the purpose of projecting a radiological dose inpact.

2.0 PRECAUTIONS

2.1 Ensure all data on the forms of the procedure is accurately recorded.

2.2 Check all calculations for accuracy.

2.3 Ensure that all cable connections on the computer are secure.

2.4 If the IBM personal computer is not available for use, proceed to EP-RET-5, Plume Projection, and EP-RET-6, Dose Projection, for performing dose projection calculations.

2.5 If both IBM personal computer and IBM mainfram computer are not available for use, proceed to ENV-3E, 3F, and 3G for performing dose projection calculations.

2.6 Meteorological data must be re-evaluated every 30 minutes or whenever significant changes occur, to determine if dose projection should be recalculated.

3.0 REFERENCE

3.1 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 10CFR50, Appendix I, Revision 1, October 1977.

3.2 U.S. EPA, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, EPA-520/1-75-001, September 1975. Appendix D Technical Bases for Methods the Estimate the Projected Thyroid Dose and Projected Whole Body Gamma Dose from Exposure to Airborne Radioiodines and Radioactive Noble Gases.

4.0 INSTRUCTIONS

4.1 Starting the IBM Personal Computer

4.1.1 Acquire the 5 1/2 inch diskette labeled "Dose Projection" from the office supplies storage file in the EOF bullpen.

4.1.2 Insert the diskette into the IBM personal computer's disk drive A. When facing the computer, the diskette label should be on the right in the corner nearest you. Close the door on disk drive A.

4.1.3 Turn the computer on. Turn the printer on. It should take approximately 40 seconds before the computer responds.

4.1.4 The Dose Projection Program is now executing. A menu will soon appear on the screen. Instructions will appear at the bottom of the screen.

4.2 Dose Projection from Plant Release Data

4.2.1 Acquire the plant release data on Form ENV 3C.1, Plant Release Data, from the RAF or the TSC and complete the appropriate section of the Form.

4.2.2 Acquire meteorological data on Forms ENV-3D.1 or ENV-3F.1, (Section I & II), Meteorological Data Worksheet and ENV-3C.1, IBM Personal Computer.

4.2.3 Enter data collected in IBM personal computer.

4.2.4 Proceed to procedure EP-ENV-3H, Protective Action Recommendation, to determine the appropriate protective action recommendation.

4.3 Dose Calculation from Field Sample Data

4.3.1 Acquire the field sample data on Form ENV-3C.2, Field Sample Data, from the EM team coordinator.

4.3.2 Acquire the meteorological data on Forms ENV-3D.1 or ENV-3F.1, (Section I & II) Meteorological Data Worksheet, that is closest in time to the time on form ENV-3C.2, Field Sample Data.

4.3.3 Enter data collected on Forms ENV-3D.1 or ENV-3F.1, (Section I & II), Meteorological Data Worksheet and ENV-3C.2, Field Sample Data into the IBM personal computer.

4.3.4 Proceed to procedure EP-ENV-3H, Protective Action Recommendation, to determine the appropriate protective action recommendation.

FORM ENV-3C.1
PLANT RELEASE DATA

DATE _____ TIME _____

Reactor Trip: Date _____ Time _____

Expect Release: Duration: _____ Hours

I. STACK ANALYTICAL RESULTS

Operating Fans: (circle one) Aux. A / Aux. B / Aux. A and B
SVA / SVB / SVA and SVB

ISOTOPE	CONCENTRATION (uCi/cc)
Kr-85	_____
KR-85m	_____
KR-87	_____
KR-88	_____
Xe-133	_____
Xe-133m	_____
Xe-135	_____
Xe-135m	_____
I-131	_____

II. SPING RESULTS

Operating Fans: (circle one) Aux. A / Aux. B / Aux. A and B
SVA / SVB / SVA and SVB

Latest 10 minute Icdine Average _____ uCi/cc
Latest 10 minute Gas Average _____ uCi/cc

III. STEAM RELEASE

Main Steam Line Monitor: _____ R/hr

SI Flow Rate: _____ gpm.

FORM ENV-3C.2

FIELD SAMPLE DATA

DATE _____ TIME _____

Sample Time: _____ Sample Location: _____

Nearest Isopleth: _____

I. GAS ANALYSIS

ISOTOPE	CONCENTRATION (uCi/cc)
Kr-85	_____
KR-85m	_____
KR-87	_____
KR-88	_____
Xe-133	_____
Xe-133m	_____
Xe-135	_____
Xe-135m	_____

II. DIRECT FIELD READINGS

Whole Body Dose Rate: _____ REM/hr

Iodine Concentration: _____ uCi/cc

WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEDURE	NO. EP-ENV-3D TITLE: Primary Determination of Meteorological Data DATE: JUN 21 1983 | PAGE 1 of 3
REVIEWED BY M L Marchi D H Myers	APPROVED BY C A Norma

1.0 APPLICABILITY

This procedure is used to gather the Kewaunee Nuclear Power Plant Meteorological Data.

2.0 PRECAUTIONS

2.1 As a minimum, the following meteorological parameters from the Kewaunee Nuclear Power Plant Meteorological tower are required to use this procedure.

a. One wind speed indication (60 meter elevation or 10 meter elevation).
b. One wind direction indication (60 meter elevation or 10 meter elevation).
c. Vertical Temperature Difference indication (Delta T between 60 meters and 10 meters)or Sigma Theta.

If this minimum data is not available, acquire and use data from EP-ENV-3E, Manual Determination of meteorological data (Green Bay Meteorological Data).

2.2 Meteorological data must be re-evaluated every 30 minutes or whenever significant changes occur.

3.0 REFERENCES

3.1 NRC Regulatory Guide 1.145, Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants, August 1979.

3.2 NRC Regulatory Guide 1.23, Rev 1 (Proposed), Meteorological Programs In Support of Nuclear Power Plants, September 1980.

4.0 INSTRUCTION

4.1 Gathering the Meteorological Data

4.1.1 Record the meteorological parameters available in section I on Form ENV-3D.1, Meteorological Data Worksheet.

4.1.2 Record the additional release information in Section II on Form ENV-3D.1, Meteorological Data Worksheet.

4.2 Lake Breeze Determination

Determine if lake breeze exists using Form ENV-3D.2, Lake Breeze Effect Worksheet. If lake breeze condition exists, enter the data on Form ENV-3D.2 into the Dose Prediction Program.

FORM ENV-3D.1

METEOROLOGICAL DATA WORKSHEET

DATE _____ TIME _____

I. METEOROLOGICAL PARAMETERS

Data Source (circle one): Primary Tower / Backup Tower

	Parameter Description	Parameter Name	Parameter Indications
a.	Wind Direction at 60 meter level	WD 60	_____ Degrees
b.	Wind Direction at 10 meter level	WD 11	_____ Degrees
c.	Wind Speed at 60 meter level	WS 60	_____ MPH
d.	Wind Speed at 10 meter level	WS 10	_____ MPH
e.	Vertical Temperature Differences	Delta T	_____ °F
f.	Standard deviation of horizontal wind direction	Sigma Theta	_____ Degrees

II. RELEASE INFORMATION

Circle one answer per question:

a. Is a primary to secondary leak in progress? YES / NO

b. Is the release from the Steam Generator Safety Valves, Steam Generator Power Operated Relief Valve or Turbine Driven Auxiliary Feed Pump Steam Exhaust? YES / NO

FORM ENV-3D.2

LAKE BREEZE EFFECT WORKSHEET

DATE _____ TIME _____

I. Is local wind direction (WD 10 from Form ENV-3D.1 or WD 60 if WD 10 is not available) between 20° and 170° clockwise?

NO - No lake breeze effect (ignore the rest of form)

YES - Proceed to step II.

II. Call Green Bay National Weather Station for the following data: (Phone

a. Green Bay wind direction: _____ degrees

b. Average opaque sky cover from sunrise to present _____ tenths

c. 850 millibar wind speed from Green Bay morning sounding _____ knots.

III. Is Green Bay wind direction between 210° and 330° clockwise?

NO - No lake breeze effect (ignore rest of form)

YES - There is a lake breeze effect (go to step IV)

IV. Determine the onset time of the lake breeze from a review of the strip chart wind direction data record in TSC. A sudden wind shift from the SW-NW sector to an easterly component will mark the onset time.

Lake Breeze Onset Time: _____

WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEDURE	NO. EP-ENV-3E REV. E TITLE: Manual Determination of X/Q (KNPP Meteorological Data) DATE: JUN 21 1983 PAGE 1 of 6
REVIEWED BY M L Marchi [signature]	APPROVED BY [signature]

1.0 APPLICABILITY

This procedure is used to estimate the atmospheric dispersion factor (X/Q) using Kewaunee Nuclear Power Plant Meteorological Data.

2.0 PRECAUTIONS

2.1 As a minimum, the following meteorological parameters from the Kewaunee Nuclear Power Plant Meteorological tower are required to use this procedure.

a. Average wind speed indication (60 meter elevation or 10 meter elevation).
b. Average wind direction indication (60 meter elevation or 10 meter elevation).
c. Vertical Temperature Difference indication (Delta T between 60 meters and 10 meters).

If this minimum data is not available, use EP-ENV-3F, Manual Determination of X/Q (Green Bay Meteorological Data), to determine atmospheric dispersion.

2.2 Meteorological data must be re-evaluated every 30 minutes or whenever significant changes occur, to determine if X/Q must be recalculated.

2.3 When determining X/Q or Xu/Q for a point of interest that falls between two isopleths on an overlay, select the value of X/Q or Xu/Q that corresponds to the isopleth lying closest to the plume centerline.

If a point of interest lays between an isopleth and plume centerline, select the value of X/Q or Xu/Q that corresponds to the nearest mile marker on the centerline.

2.4 the WIND DIRECTION CIRCLE on the Base Map may appear to the user to be shifted 180 degrees. This is not an error. the WIND DIRECTION CIRCLE reflects the direct use of wind direction information.

3.0 REFERENCES

3.1 NRC Regulatory Guide 1.145, Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants, August 1979.

3.2 NRC Regulatory Guide 1.23, Rev 1 (Proposed), Meteorological Programs In Support of Nuclear Power Plants, September 1980.

4.0 INSTRUCTIONS

4.1 Record Meteorological Parameters Section I on Form ENV-3E.1, Meteorological Data Worksheet.

4.2 Determine the stability class using the Vertical Temperature Difference (item I-E on Form ENV-3E.1) and the table in Section II of Form ENV-3E.1).

4.3 Determine release elevation from Section III of Form ENV-3E.1.

4.4 For Elevated Releases complete steps 4.4.1 through 4.4.8. If the release is ground level, proceed to step 4.5.

4.4.1 Place the elevated overlay for the stability class determined in step 4.2 on the Base Map.

4.4.2 Align the centerline of the overlay with the actual wind direction value from WD60 (item I-A on Form ENV-3E.1) on the Base Map Wind Direction Circle.

NOTE: If WD60 value is not available, use WD10 value.

4.4.3 Record points of interest in the path of the plume in column 1 on Form ENV-3E.2 and record the corresponding sector in column 2.

4.4.4 Determine the distance from the release point to each point of interest and record in column 3 of Form ENV-3E.2 (Base Map Scale: 2 inches = 1 mile).

4.4.5 Record wind speed WS60 in column 4 of Form ENV-3E.2 (Wind Speed is the same for all points of interest).

NOTE: If WS60 is not available, use WS10 value.

4.4.6 Calculate impact time (IT) using the formula on Form ENV-3E.2 and record in column 5.

4.4.7 Determine X/Q for each point of interest from the overlay and record in column 7 of Form ENV-3E.2.

4.4.8 Proceed to step 4.6 (step 4.5 is not required for elevated releases).

4.5 For Ground Level Releases, complete steps 4.5.1 through 4.5.8.

4.5.1 Place the ground level overlay for the stability class determined in step 4.2 on the Base Map.

4.5.2 Align the centerline of the overlay with the actual wind direction value from WD10 (item I-B on Form ENV-3E.1) on the Base Map Wind Direction Circle.

NOTE: If WD10 is not available, use WD60 value.

4.5.3 Record points of interest in the path of the plume in column 1 of Form ENV-3E.2 and record the corresponding sector in column 2.

4.5.4 Determine the distance from the release point to each point of interest and record in column 3 of Form ENV-3E.2 (Base Map Scale: 2 inches = 1 mile).

4.5.5 Record wind speed WS10 in column 4 of Form ENV-3E.2 (Wind Speed is the same for all points of interest).

NOTE: If WS10 is not available, use WS60 value.

4.5.6 Calculate impact time (IT) using the formula on Form ENV-3E.2 and record in column 5.

4.5.7 Determine Xu/Q for each point of interest from the overlay and record in column 6 of Form ENV-3E.2.

4.5.8 Calculate X/Q for each point of interest using the formula on Form ENV-3E.2 and record in column 7.

4.6 Determine if lake breeze exists using Form ENV-3E.2. If lake breeze conditions exist, implement special field monitoring in accordance with EP-ENV-3A, section 6.0.

FORM ENV-3E.1
METEOROLOGICAL DATA WORKSHEET

DATE _____ TIME _____

I. Meteorological Parameters

Paramenter Description	Parameter Name	Parameter Indication
A. Wind Direction at 60 meter level	WD60	_____ Degrees
B. Wind Direction at 10 meter level	WD10	_____ Degrees
C. Wind speed at 60 meter level	WS60	___mph x 0.447 = ____m/sec
D. Wind speed at 10 meter level	WS10	___mph x 0.447 = ____m/sec
E. Vertical Temperature Difference	VTD	_____ °F
F. Standard Deviation of Horizontal Wind Direction	SIGMA THETA	_____ Degrees

II. Stability Class

Use below table to determine stability class.

Stability Classification	Pasquill Categories	Sigma Theta (degrees)	VTD (°F)
Extremely unstable	A	$\sigma_\theta \geq 22.5$	VTD $\leq$ - 1.71
Moderately unstable	B	$22.5 > \sigma_\theta \geq 17.5$	-1.71< VTD $\leq$ - 1.53
Slightly unstable	C	$17.5 > \sigma_\theta \geq 12.5$	-1.53< VTD $\leq$ - 1.35
Neutral	D	$12.5 > \sigma_\theta \geq 7.5$	-1.35< VTD $\leq$ - 0.45
Slightly stable	E	$7.5 > \sigma_\theta \geq 3.8$	-0.45< VTD $\leq$ 1.35
Moderately stable	F	$3.8 > \sigma_\theta \geq 2.1$	1.35< VTD $\leq$ 3.60
Extremely stable	G	$2.1 > \sigma\theta$	3.60< VTD

NOTE: If VTD and Sigma Theta do not agree use VTD classification.

III. Release Elevation

An Elevated release must meet all of the below criteria, otherwise the release is considered Ground Level.

a. Primary to Secondary Leak is in progress.
b. Release is from Steam Generator Safety Valves, Steam Generator Power Operated Relief Valve or Auxiliary Feed Pump Turbine Exhaust.
c. Wind speed is less than 1m/sec.
d. Stability class is A, B, C or D.

_____ Elevated _____ Ground Level

FORM ENV-3E.2

RELEASE WORKSHEET DATE _____ TIME _____

1	2	3	4	5	6	7
Point of Interest	Sector	(D) Distance (miles)	(WS) Wind Speed (meters/sec)	(TT)* Impact Time (minutes)	Xu/Q** (meters^{-2}	X/Q*** (sec/meters^3)

* IT = D/WS x 27

** N/A for Elevated Release

*** When calculating for Ground Level Release: $X/Q = \frac{(Xu/Q)}{WS}$

FORM ENV-3E.3

LAKE BREEZE EFFECT WORKSHEET

DATE _____ TIME _____

I. Is local wind direction (WD10 from Form 3E.1 or WD60 if WD10 is not available) between 20° and 170° clockwise?

No - No lake breeze effect

Yes - Proceed to Step II

II. Call Green Bay National Weather Station and get wind direction in degrees.

(Phone Number _____

Wind Direction _____

III. Is Green Bay wind direction between 210° and 330° clockwise?

No - No lake breeze effect

Yes - Lake breeze effect

WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEDURE	NO. EP-ENV-3F REV. D TITLE: Manual Determination of X/Q (Green Bay Meteorological Data) DATE: JUN 2 1 1983 PAGE 1 of 7
REVIEWED BY M L Marchi T R Meyer	APPROVED BY C. J. Hoffman

1.0 APPLICABILITY

This procedure is used to estimate the atmospheric dispersion factor (X/Q) using Green Bay National Weather Service Meteorological Data when Kewaunee Nuclear Power Plant Meteorological Data is not available.

2.0 PRECAUTIONS

2.1 This procedure is to be used only when the following minimum meteorological parameters are not available from the Kewaunee Nuclear Power Plant Meteorological tower.

a. One wind speed indication (60 meter elevation or 10 meter elevation).
b. One wind direction indication (60 meter elevation or 10 meter elevation).
c. Vertical Temperature Difference indication or Sigma Theta.

2.2 Meteorological data must be re-evaluated every 30 minutes or whenever significant changes occur, to determine if X/Q must be recalculated.

2.3 When determining Xu/Q for a point of interest that falls between two isopleths on an overlay, select the value of Xu/Q that corresponds to the isopleth lying closest to the plume centerline.

If a point of interest lays between an isopleth and plume centerline, select the value of Xu/Q that corresponds to the nearest mile marker on the centerline.

2.4 The WIND DIRECTION CIRCLE on the Base Map may appear to the user to be shifted 180 degrees. This is not an error. The WIND DIRECTION CIRCLE reflects the direct use of wind direction information.

3.0 REFERENCES

3.1 NRC Regulatory Guide 1.145, Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants, August 1979.

3.2 NRC Regulatory Guide 1.23, Rev 1 (Proposed), Meteorological Programs In Support of Nuclear Power Plants, September 1980.

4.0 INSTRUCTIONS

4.1 Call the National Weather Service Station at Green Bay (for meteorological parameters I.A, B, C and D on Form ENV-3D.1.

4.2 Call Point Beach Nuclear Plant for meteorological parameters II.A & B on Form ENV-3F.1.

4.3 Determine the stability class from step III of Form ENV-3F.1.

4.4 Place the ground level overlay for the stability class determined in step 4.3 on the Base Map.

4.5 Align the centerline of the overlay with the wind direction value on the base map wind direction circle.

NOTE: Use local wind direction if available. Use Green Bay wind direction (parameter I.A on Form ENV-3F.1), if not available at the plant.

4.6 Record points of interest in the path of the plume in column 1 of Form ENV-3F.2 and record the corresponding sector in column 2.

4.7 Determine the distance from the release point to each point of interest and record in column 3 of Form ENV-3F.2 (Base Map Scale: 2 inches = 1 mile).

4.8 Record local wind speed (parameter II.B on Form ENV-3F.1) in m/sec in column 4 of Form ENV-3F.2 (wind speed is the same for all points of interest).

NOTE: If local wind speed is not available, use Green Bay wind speed (parameter I.B on Form ENV-3F.1).

4.9 Calculate impact time (IT) using the formula on Form ENV-3F.2 and record in column 5.

4.10 Determine Xu/Q for each point of interest from the overlay and record in column 6 of Form ENV-3F.2.

4.11 Calculate X/Q using the formula on Form ENV-3F.2 and record in column 7.

4.12 Determine if lake breeze exists using Form ENV-3F.3. If lake breeze conditions exist, implement special field monitoring in accordance with EP-ENV-3A, section 6.0.

FORM ENV-3F.1
METEOROLOGICAL DATA WORKSHEET

DATE_____ TIME_____

I. Meteorological Parameters (Green Bay)

	Parameter Description	Parameter Name	Parameter Indication
A.	Wind Direction	WD(GB)	_____ Degrees
B.	Wind Speed	WS(GB) ____ Knots x 0.515 =	_____ meters/sec
C.	Opaque Cloud Cover	CLCVR	_____ (tenths)
D.	Cloud Ceiling	CLCEG	_____ (feet)
E.	Observation Time of above		_____ (time)

II. Meteorological Parameters (Point Beach)

A.	Wind Direction	WD(PB)	_____ Degrees
B.	Wind Speed	WS(PB) ____ mph x 0.447 =	_____ meters/sec

III. Stability Class

A. Determine the Insolation Class Number (INCLNO) from the below table. _____ INCLNO

	HOUR OF DAY From/To (Military Time)*												
DATE	0001 0600	0601 0700	0701 0800	0801 0900	0901 1000	1001 1100	1101 1200	1201 1300	1301 1400	1401 1500	1501 1600	1601 1700	1701 2400
1/5-1/22	1	1	1	1	2	2	2	2	2	1	1	1	1
1/23-2/6	1	1	1	1	2	2	2	2	2	1	1	1	1
2/7-2/21	1	1	1	2	2	2	2	2	2	2	1	1	1
2/22-3/8	1	1	1	2	2	2	3	2	2	2	1	1	1
3/9-3/23	1	1	2	2	2	3	3	3	2	2	2	1	1
3/24-4/7	1	1	2	2	3	3	3	3	3	2	2	1	1
4/8-4/22	1	1	2	3	3	3	3	3	3	3	2	1	1
4/23-5/7	1	2	2	3	3	3	3	3	3	3	2	2	1
5/8-5/22	1	2	2	3	3	3	4	3	3	3	2	2	1
5/23-6/6	1	2	2	3	3	4	4	4	3	3	2	2	1
6/7-6/21	1	2	2	3	3	4	4	4	3	3	2	2	1
6/22-7/6	1	2	2	3	3	4	4	4	3	3	2	2	1
7/7-7/21	1	2	2	3	3	4	4	4	3	3	2	2	1
7/22-8/5	1	2	2	3	3	3	4	3	3	3	2	2	1
8/6-8/20	1	2	2	3	3	3	3	3	3	3	2	2	1
8/21-9/4	1	1	2	3	3	3	3	3	3	3	2	1	1
9/5-9/19	1	1	2	2	3	3	3	3	3	2	2	1	1
9/20-10/4	1	1	2	2	2	3	3	3	2	2	2	1	1
10/5-10/19	1	1	1	2	2	2	3	2	2	2	1	1	1
10/20-11/3	1	1	1	2	2	2	3	2	2	2	1	1	1
11/4-11/18	1	1	1	2	2	2	2	2	2	2	1	1	1
11/19-12/3	1	1	1	1	2	2	2	2	2	1	1	1	1
12/4-12/18	1	1	1	1	2	2	2	2	2	1	1	1	1
12/19-1/4	1	1	1	1	2	2	2	2	2	1	1	1	1

* If daylight savings time is in effect, subtract 1 hour from local time.

FORM ENV-3F.1 (cont'd)
METEOROLOGICAL DATA WORKSHEET DATE _____ TIME _____

B. Determine Net Radiation Index (NRADI) from opaque cloud cover (CLCVR step I.C above), cloud ceiling (CLCEG - step I.D above), isolation class number (INCLNO - step III.A above), and the below table:

NRADI

NRADI During Daytime (function of CLCVR and CLCEG) and Nighttime Conditions

	Daytime			Nighttime***
	CLCEG			
CLVR	< 7,000 ft	7,000-15,000 ft	≥16,000 ft	
0/10	NRADI = ICLNO			NRADI = -2
1/10				
2/10				
3/10				
4/10				
5/10				
6/10	NRADI*= ICLNO -2	NRADI* = ICLNO -1		NRADI** = -1
7/10				
8/10				
9/10				
10/10	NRADI = 0			

* If NRADI is less than 1, set NRADI equal to 1.

** If CLCVR is 10/10 and CLCEG is less than 7000 ft, NRADI equals 0.

*** Nighttime is defined as that period of time from 1 hour before sunset to one hour after sunrise (see TABLE ENV-3F).

C. Determine the Stability Class from wind speed in meters per second (WS(PB) step II.B above) and Net Radiation Index (NRADI - step III.B above) from the below table:

NOTE: If WS(PB) is not available, use WS(GB) from step I.B above.

STABILITY CLASS

Stability Class as a Function of NRADI and Wind Speed

WS	NRADI						
m/sec	4	3	2	1	0	-1	-2
0-0.77	A	A	B	C	D	F	G
0.78-1.80	A	B	B	C	D	F	G
1.81-2.83	A	B	C	D	D	E	F
2.84-3.35	B	B	C	D	D	E	F
3.36-3.86	B	B	C	D	D	D	E
3.87-4.89	B	C	C	D	D	D	E
4.90-5.41	C	C	D	D	D	D	E
5.42-5.92	C	C	D	D	D	D	D
> 5.92	C	D	D	D	D	D	D

FORM ENV-3F.2

RELEASE WORKSHEET

DATE _____ TIME _____

1	2	3	4	5	6	7
Point of Interest	Sector	(D) Distance (miles)	(WS) Wind Speed (meters/sec)	(IT)* Impact Time (minutes)	Xu/Q ($meters^{-2}$)	X/Q** ($sec/meters^2$)

* IT = D/WS x 27

** $X/Q = \frac{(Xu/Q)}{(WS)}$

FORM ENV-3F.3

LAKE BREEZE EFFECT WORKSHEET

DATE _____ TIME _____

I. Is local wind direction (WDPB - step II.B on Form ENV-3F.1) between 20° and 170° clockwise?

No - No Lake Breeze

Yes - Proceed to step II

II. Is Green Bay wind direction (WDGB - step I.B on Form ENV-3F.1) between 210° and 330° clockwise?

No - No Lake Breeze Effect

Yes - Lake Breeze Effect

SUNRISE AND SUNSET AT MILWAUKEE, WISCONSIN

CENTRAL STANDARD TIME

NO. 1322

DAY	JAN.		FEB.		MAR.		APR.		MAY		JUNE		JULY		AUG.		SEPT		OCT.		NOV		DEC.	
	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.
1	7 23	4 28	7 07	5 04	6 28	5 41	5 34	6 17	4 46	6 52	4 15	7 24	4 16	7 34	4 42	7 13	5 16	6 27	5 48	5 33	6 26	4 44	7 03	4 18
2	7 23	4 29	7 06	5 05	6 26	5 42	5 33	6 19	4 45	6 53	4 15	7 24	4 17	7 34	4 43	7 12	5 17	6 25	5 50	5 32	6 27	4 43	7 04	4 18
3	7 23	4 29	7 05	5 07	6 25	5 43	5 31	6 20	4 43	6 54	4 15	7 25	4 17	7 34	4 44	7 11	5 18	6 23	5 51	5 30	6 28	4 42	7 05	4 18
4	7 23	4 30	7 04	5 08	6 23	5 44	5 29	6 21	4 42	6 55	4 14	7 26	4 18	7 34	4 45	7 09	5 19	6 22	5 52	5 28	6 29	4 40	7 06	4 18
5	7 23	4 31	7 03	5 09	6 22	5 46	5 27	6 22	4 41	6 57	4 14	7 27	4 18	7 33	4 46	7 08	5 20	6 20	5 53	5 26	6 31	4 39	7 07	4 17
6	7 23	4 32	7 01	5 11	6 20	5 47	5 26	6 23	4 39	6 58	4 13	7 27	4 19	7 33	4 47	7 07	5 21	6 18	5 54	5 25	6 32	4 38	7 08	4 17
7	7 23	4 33	7 00	5 12	6 18	5 48	5 24	6 24	4 38	6 59	4 13	7 28	4 20	7 33	4 48	7 05	5 22	6 16	5 55	5 23	6 33	4 37	7 09	4 17
8	7 23	4 34	6 59	5 13	6 16	5 49	5 22	6 26	4 37	7 00	4 13	7 29	4 20	7 32	4 49	7 04	5 23	6 15	5 56	5 21	6 35	4 36	7 10	4 17
9	7 22	4 35	6 58	5 15	6 15	5 50	5 20	6 27	4 36	7 01	4 13	7 29	4 21	7 32	4 51	7 03	5 24	6 13	5 58	5 20	6 36	4 35	7 11	4 17
10	7 22	4 37	6 56	5 16	6 13	5 52	5 19	6 28	4 34	7 02	4 12	7 30	4 22	7 31	4 52	7 01	5 25	6 11	5 59	5 18	6 37	4 33	7 12	4 17
11	7 22	4 38	6 55	5 17	6 11	5 53	5 17	6 29	4 33	7 03	4 12	7 30	4 23	7 31	4 53	7 00	5 26	6 09	6 00	5 16	6 38	4 32	7 12	4 17
12	7 21	4 39	6 54	5 19	6 10	5 54	5 15	6 30	4 32	7 04	4 12	7 31	4 23	7 30	4 54	6 59	5 28	6 08	6 01	5 15	6 40	4 31	7 13	4 17
13	7 21	4 40	6 52	5 20	6 08	5 55	5 14	6 31	4 31	7 05	4 12	7 31	4 24	7 30	4 55	6 57	5 29	6 06	6 02	5 13	6 41	4 30	7 14	4 17
14	7 21	4 41	6 51	5 21	6 06	5 56	5 12	6 33	4 30	7 06	4 12	7 32	4 25	7 29	4 56	6 56	5 30	6 04	6 03	5 11	6 42	4 29	7 15	4 18
15	7 20	4 42	6 50	5 23	6 04	5 58	5 10	6 34	4 29	7 08	4 12	7 32	4 26	7 29	4 57	6 54	5 31	6 02	6 05	5 10	6 44	4 26	7 16	4 18
16	7 20	4 43	6 48	5 24	6 03	5 59	5 09	6 35	4 28	7 09	4 12	7 33	4 27	7 28	4 58	6 53	5 32	6 00	6 06	5 08	6 45	4 28	7 16	4 18
17	7 19	4 45	6 47	5 25	6 01	6 00	5 07	6 36	4 27	7 10	4 12	7 33	4 27	7 27	4 59	6 51	5 33	5 59	6 07	5 06	6 46	4 27	7 17	4 18
18	7 19	4 46	6 45	5 27	5 59	6 01	5 06	6 37	4 26	7 11	4 12	7 33	4 28	7 27	5 00	6 50	5 34	5 57	6 08	5 05	6 47	4 26	7 18	4 19
19	7 18	4 47	6 44	5 28	5 57	6 02	5 04	6 38	4 25	7 12	4 12	7 33	4 29	7 26	5 01	6 48	5 35	5 55	6 09	5 03	6 49	4 25	7 18	4 19
20	7 17	4 48	6 42	5 29	5 56	6 04	5 02	6 39	4 24	7 13	4 12	7 34	4 30	7 25	5 03	6 47	5 36	5 53	6 11	5 02	6 50	4 24	7 19	4 19
21	7 17	4 50	6 41	5 30	5 54	6 05	5 01	6 41	4 23	7 14	4 12	7 34	4 31	7 24	5 04	6 45	5 37	5 51	6 12	5 00	6 51	4 24	7 19	4 20
22	7 16	4 51	6 39	5 32	5 52	6 06	4 59	6 42	4 22	7 15	4 13	7 34	4 32	7 23	5 05	6 43	5 38	5 50	6 13	4 59	6 52	4 23	7 20	4 20
23	7 15	4 52	6 38	5 33	5 50	6 07	4 58	6 43	4 21	7 16	4 13	7 34	4 33	7 22	5 06	6 42	5 40	5 48	6 14	4 57	6 53	4 22	7 20	4 21
24	7 14	4 54	6 36	5 34	5 48	6 08	4 56	6 44	4 21	7 17	4 13	7 34	4 34	7 21	5 07	6 40	5 41	5 46	6 16	4 55	6 55	4 22	7 21	4 22
25	7 14	4 55	6 35	5 36	5 47	6 09	4 55	6 45	4 20	7 18	4 14	7 35	4 35	7 21	5 08	6 39	5 42	5 44	6 17	4 54	6 56	4 21	7 21	4 22
26	7 13	4 56	6 33	5 37	5 45	6 11	4 53	6 46	4 19	7 18	4 14	7 35	4 36	7 20	5 09	6 37	5 43	5 42	6 18	4 53	6 57	4 20	7 22	4 23
27	7 12	4 58	6 31	5 38	5 43	6 12	4 52	6 47	4 18	7 19	4 14	7 35	4 37	7 18	5 10	6 35	5 44	5 41	6 19	4 51	6 58	4 20	7 22	4 24
28	7 11	4 59	6 30	5 39	5 41	6 13	4 50	6 49	4 16	7 20	4 15	7 35	4 38	7 17	5 11	6 34	5 45	5 39	6 21	4 50	6 59	4 19	7 22	4 24
29	7 10	5 00	6 29	5 40	5 40	6 14	4 49	6 50	4 17	7 21	4 15	7 35	4 39	7 16	5 12	6 32	5 46	5 37	6 22	4 48	7 00	4 19	7 22	4 25
30	7 09	5 01			5 38	6 15	4 47	6 51	4 17	7 22	4 16	7 34	4 40	7 15	5 13	6 30	5 47	5 35	6 23	4 47	7 02	4 19	7 23	4 26
31	7 08	5 03			5 36	6 16			4 16	7 23			4 41	7 14	5 15	6 29			6 24	4 46			7 23	4 27

Add one hour for Daylight Saving Time if and when in use.

WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEDURE	NO. EP-ENV-3G REV. D TITLE: Manual Dose Projection Calculation DATE: JUN 2 1 1983 PAGE 1 of 8
REVIEWED BY [signature]	APPROVED BY [signature]

1.0 APPLICABILITY

This procedure will be utilized by the Environmental Protection Director during any incident that involves a significant release of radioactive materials to the environment, for the purpose of projecting a radiological dose impact.

2.0 PRECAUTIONS

2.1 Ensure all data on the forms of this procedure is accurately recorded.

2.2 Check all calculations for accuracy.

3.0 REFERENCES

3.1 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 10CFR50, Appendix I, Revision 1, October 1977.

3.2 U.S. EPA, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, EPA-520/1-75-001, September 1975. Appendix D Technical Bases for Methods the Estimate the Projected Thyroid Dose and Projected Whole Body Gamma Dose from Exposure to Airborne Radioiodines and Radioactive Noble Gases.

4.0 INSTRUCTIONS

4.1 Whole Body Dose Projection Estimate

If the source term is identified by sample results which quantifies specific nuclide content, then a conservative whole body dose estimate may be calculated using form ENV-3G.1, Estimated Whole Body Dose Calculation Worksheet.

4.1.1 Acquire the data needed for Section I of Form ENV-3G.1 from the RAF or TSC.

NOTE: Data Needed: Release rate of Noble gas in (Ci/sec), actual or estimated release duration, and X/Q from EP-ENV-3E or 3F.

4.1.2 Calculate the Whole Body Dose Projection Estimate using Section II of Form ENV-3G.1 and the following equation:

$$D(REM) = X/Q(Sec/m^3) \times Q(Ci/Sec) \times T(hrs) \times DF\left(\frac{REM - m^3}{Ci - hrs}\right)$$

where:

D = projected whole body dose estimate (REM)

X/Q = Atmospheric dispersion coefficient determined on Form ENV-3E.2 or ENV-3F.2 (Sec/m^3)

Q = Nuclide equivalent release rate (Ci/Sec) from EP-RET-5 (Flow rate (cc/sec) x conc. (uCi/cc) x 10E-06)

DF = Whole body dose conversion factor $\left(\frac{REM - m^3}{Ci - hrs}\right)$

NOTE: The whole body dose conversion factor is calculated from NRC Regulatory Guide 1.109, Rev 1, dated October 1977.

4.1.3 Field Sample Analysis Method (Marinelli Beaker of a Field Drawn RAP Sample).

Complete Sections I & II of Form ENV-3G.2 and the following equation:

$$D(REM) = FC \times DF \times T$$

where:

D = Is Dose in REM

DF = Whole body dose conversion factor $\left(\frac{REM - M^3}{Ci - hrs}\right)$

T = Release duration in hours

FC = Field Concentration of specific nuclide in uC/cc as per Gamma Scan result

NOTE: A separate Calculation Form is required for each point of interest.

4.2 Thyroid Dose Projection Estimate

If an Iodine Source Term is identified, calculate the projected or estimated dose for each point of interest by using a separate Form ENV-3G.2 and one of the following methods.

4.2.1 Inplant Sample Method

Complete Section I of Form ENV-3G.2 for each point of interest if the release rate of Iodine-131 (Ci/sec) is available for a thyroid dose projection estimate.

4.2.2 Field Sample Analysis Method

Complete Section II of Form ENV-3G.3 for each point of interest if the actual measured Iodine-131 airborne concentration (uC/cc) is available for a thyroid dose projection estimate. This method is also to be used as a backup for the Inplant Sample Method.

NOTE: This method assumes only Iodine-131 exposure, so it will only be an approximation of the total Iodine dose.

4.3 Record all results of Dose Projections by the method used on Form ENV-3A and the field map. Also, report this data to the Radiological Protection Director, Emergency Response Manager, and Technical Support Center Communicator.

4.4 Proceed to procedure EP-ENV-3H, Protective Action Recommendation Determination, to determine the appropriate Protective Action Recommendations.

FORM ENV-3G.1

ESTIMATED WHOLE BODY DOSE CALCULATION WORKSHEET
FOR
SPECIFIC NOBLE GAS RELEASE

LOCATION: Sector/Point # _____ DATE _____ TIME ____ ____

I. Enter data available below:

A. (Record in Column 1 of section II below) Noble Gas Nuclides release rates
(Data is available from the RPD or TSCD)

B. X/Q as determined and recorded on Form ENV-3E.2 or 3F.2 _____ (Sec/m^3)

C. (Data available from RPD or TSCD) Release Duration _____ (hrs)

II. Calculate dose for each nuclide and sum all doses to get total exposure dose by using the formula below:

Nuclide	Release Rate (Ci/Sec)	x	X/Q(Sec/m^3)	x	Release Duration(hrs)	x	Dose Factor $\frac{(REM\text{-}m^3)}{(Ci\text{-}hr)}$	=	Dose (REM)
Kr-85		x		x		x	1.84	=	
Kr-85m		x		x		x	1.34×10^2	=	
Kr-87		x		x		x	6.76×10^2	=	
Kr-88		x		x		x	1.68×10^3	=	
Xe-133		x		x		x	3.36×10^1	=	
Xe-133m		x		x		x	2.87×10^1	=	
Xe-135		x		x		x	2.06×10^2	=	
Xe-135m		x		x		x	3.56×10^2	=	

Signature of Completing Authority and Title _____ (Signature)

_____ (Title)

TOTAL WHOLE BODY EXPOSURE DOSE = _____

FORM ENV-3G.2

FIELD SAMPLE ANALYSIS METHOD OF WHOLE BODY DOSE CALCULATION

LOCATION: Sector/Point # _____ DATE _____ TIME _____

Section I (Enter data available below)

A. Record the Field Conctnrrations of Gamma Scan Identified Noble Gases in Section II, Column I. (Data is available from RPO/RAF or TSCD)

B. Release Duration (actual or estimated) _____

Section II - Calculate doses for each nuclide and sum all doses to get total exposure dose by using the formula below.

Nuclide	Field Concentration (uC/cc)		Dose Factor $\frac{(REM\text{-}m^3)}{(Ci\text{-}hr)}$		Release Duration (hrs)		Dose (REM)
Kr-85		x	1.84	x		=	
Kr-85m		x	1.34×10^2	x		=	
Kr-87		x	6.76×10^2	x		=	
Kr-88		x	1.68×10^3	x		=	
Xe-133		x	3.36×10^1	x		=	
Xe-133m		x	2.87×10^1	x		=	
Xe-135		x	2.06×10^2	x		=	
Xe-135m		x	3.56×10^2	x		=	

Signature of Completing Authority and Title _____ (Signature)

_____ (Title)

TOTAL WHOLE BODY DOSE = _____

FORM ENV-3G.3
ESTIMATED THYROID DOSE PROJECTION CALCULATION

LOCATION: Sector/Point # _____ DATE _____ TIME _____

I. INPLANT SAMPLE METHOD

A. Iodine-131 Release Rates _____ (Ci/sec)

B. X/Q at the point of interest from Form ENV-3E.2 or 3F.2 _____ (Sec/m^3)

C. Release Duration (Data available from RPD or TSCD) _____ (hrs)

D. Calculated Iodine-131 Concentration at the point of interest.

Release Rate(Ci/Sec) x X/Q(Sec/m^3) = uC/cc of I-131

_____ X _____ = _____ uC/cc of I-131

E. Determine Estimated Total Thyroid Dose from Figure ENV-3G. Use the Calculated Iodine-131 Concentration on the X-axis and go vertically up the graph to intersect the appropriate Release Duration line, then read off the Y-axis the Estimated Total Thyroid Dose.

Calculated I-131 Concentration vs. Release Duration => Total Thyroid Dose

_____ uC/cc vs. _____ hrs => _____ REM

F. Multiply Thyroid Dose (in REM) by 2 and make recommendation based on corrected thyroid dose.

Thyroid Dose (from step "E") x 2 = Corrected Thyroid Dose in REM.

_____ REM x 2 = _____ REM

NOTE: EPA Guidelines state that protective action recommendations based on thyroid dose should use the dose calculated for children in the affected population.

FORM ENV-3G.3
ESTIMATED THYROID DOSE PROJECTION CALCULATION

II. FIELD SAMPLE ANALYSIS METHOD

A. Field Sample Analysis I-131 Concentration at the point of interest _____ uC/cc

B. Release Duration (Data available from the RPD or TSCD) _____ (hrs)

C. Determine Estimated Total Thyroid Dose from Figure ENV-3G. Use the field sample analysis I-131 concentration on the X-axis and go vertically up the graph to intersect the appropriate Release Duration line, then read off the Y-axis the Estimated Total Thyroid Dose.

Field Sample Analysis

Iodine-131 Concentration vs. Release Duration => Total Thyroid Dose

_____ uC/cc vs. _____ hrs => _____ REM

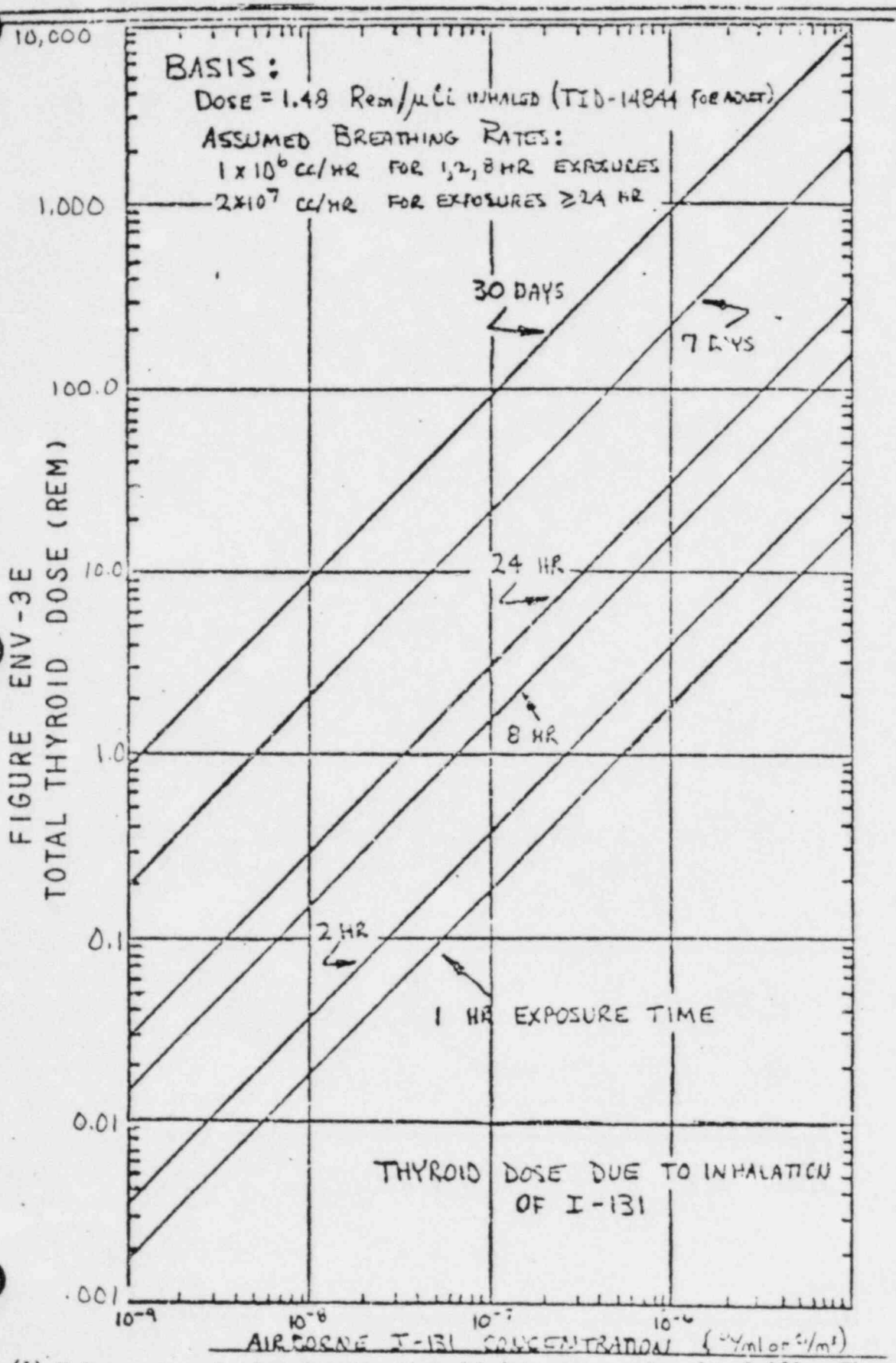
D. Multiply Thyroid Dose (in REM) by 2 and make recommendation based on corrected thyroid dose.

Thyroid Dose (from step "E") x 2 = Corrected Thyroid Dose in REM.

_____ REM x 2 = _____ REM

NOTE: EPA Guidelines state that protective action recommendations based on thyroid dose should use the dose calculated for children in the affected population.

COMPLETED BY _____ _____
(Title)



(1) Values are calculated using the old dose conversion for I-131. The new constant in the reference is 1.5×10^6. However, the old conversion, 1.8×10^6, is used for conservatism.

(2) To approximate the child (6 months to one year worst case) thyroid dose from the adult dose multiply it by a factor of 2

WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEDURE	NO. EP-ENV-3H REV. B TITLE: Protective Action Recommendations DATE: JUN 21 1983 PAGE 1 of 6
REVIEWED BY	APPROVED BY

1.0 APPLICABILITY

This procedure applies to all emergency situations when environmental monitoring and dose assessment is necessary, and Environmental Monitoring Teams have been dispatched.

2.0 PRECAUTIONS

2.1 Accurate recording of data acquired from the Radiological Protection Director (RPD) or Environmental Monitoring Team (EMT) Coordinator is essential.

2.2 All conclusions drawn from environmental data must be accurately documented.

3.0 REFERENCES

None

4.0 INSTRUCTIONS

4.1 Short Term Protective Action Determinations

4.1.1 Obtain the printer output or completed data sheets and worksheets for the dose projection and field sample evaluations.

4.1.2 Compare these results for all points of interest to TABLES ENV-3H.1 as follows:

TABLE ENV-3H.1: Take the projected Dose(s) and enter the chart at the appropriate level by projected Doses listed in the left hand column. Read across from the Doses and obtain the corresponding Recommended Actions and comments.

NOTE: EPA guidelines state that protective action recommendations should be based on the projected child thyroid dose.

4.1.3 Record the impact times on the Field Maps at the points of interest.

4.1.4 Evaluate the impact time, plant conditions (past, present and future), weather conditions, and evacuation time estimates, and determine the most beneficial and appropriate Protective Actions the public can take to reduce their exposure.

4.1.5 Verify previous recommendations, if any are still valid, for any new data that is now available.

4.1.6 Report Protective Action Recommendations to the Emergency Response Manager.

4.1.7 Repeat steps 4.1.2 through 4.1.6 as necessary as new information is received from the Environmental Monitoring Teams.

4.2 Long Term Protective Action Determinations

4.2.1 Obtain data from the results of ground deposition samples reported by the Environmental Consultant.

4.2.2 Compare these results to Table ENV-3H.2 to determine the appropriate Protective Action Recommendations as follows.

Table ENV-3H.2:

Section I, Part A: Compare the projected dose above ground, Ground Contamination level measurements, or exposure rates 1 meter above ground and at or above these base limits proceed to Part B for the Recommended Protective Actions.

Section II, Part A: Evaluate the results of the Environmental Consultant. The results of a specific nuclide concentration (I-131, Cs-137, Sr-90, and/or Sr-89) and the medium in which it was obtained are listed for comparison against the reported results. For example, if a milk analysis was reported by the Environmental Consultant at 0.012 uc/ml of I-131, proceed to the I-131 column under the heading Nuclide. Then read to the right for the Action Levels and concentrtion in Milk & Water Preventive or Emergency Levels, and compare the levels to the reported result. If the Reported result is less than the preventive level, no protective action is necessary. If the results are higher than the preventive or Emergency level, then proceed to the next page and recommend the listed protective action recommendations, as in the example, the recommendations under preventive level.

4.2.3 Record Protective Action Recommendations in EPD Log Book.

4.2.4 Report Protective Action Recommendations to the Emergency Response Manager.

4.2.5 Repeat steps 4.2.1 through 4.2.4 as necessary as new information is received from the Environmental Consultant.

TABLE ENV-3H.1

RECOMMENDED PROTECTIVE ACTIONS TO REDUCE WHOLE BODY AND THYROID DOSE FROM EXPOSURE TO A GASEOUS PLUME

Projected Dose (Rem) to Individual in General Public	Recommended Actions(a)	Comments
Whole body < 1 or Thyroid < 5	No planned Protective Actions.(b) State may issue an advisory to seek shelter and await further instructions. Monitor environmental radiation levels.	Previously recommended Protective Actions may be reconsidered or terminated.
Whole body 1 to < 5 or Thyroid 5 to < 25	Seek shelter as a minimum. Consider evacuation. Evacuate unless constraints make it impractical. Monitor environmental radiation levels. Control access to the affected area.	If constraints exist, special consideration should be given for evacuation of children and pregnant women.
Whole body 5 and above or Thyroid 25 and above	Conduct mandatory evacuation. Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access to the affected areas.	Seeking shelter would be an alternative if evacuation were not immediately possible.

(a) These actions are recommended for planning purposes. Protective Action decisions at the time of the incident must take existing conditions into consideration.

(b) At the time of the incident, officials may implement low-impact Protective Actions in keeping with the principle of maintaining radiation exposure as low as reasonably achievable.

Reference: Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, EPA-520/1-75-001, September 1975, U.S. Environmental Protection Agency.

TABLE ENV-3H.2

GUIDELINES FOR PROTECTION AGAINST INGESTION OF CONTAMINATION

I. GROUND CONTAMINATION

A. Action Levels

1. Projected whole-body dose above the ground $\geq$ 1 REM.

2. Ground Contamination levels $\geq 4.4 \times 10^7$ DPM/100cm^2 at t = 1 hr post-accident

3. Exposure rate $\geq$12 mR/hr at 1 meter above ground at t = 1 hr post-accident

B. Recommended Protective Actions

1. Evacuation of affected areas.

2. Restriction of entry to contaminated offsite areas until radiation level has decreased to State approved levels.

II. FOOD AND WATER CONTAMINATION

A. Action Levels

Preventive Level: 0.5 REM WB or bone, 1.5 REM thyroid

Emergency Level: 5 REM WB or bone, 15 REM thyroid

	Concentration in Milk or Water		Total Intake via all Food and Water Pathways		Pasture Grass (Fresh Weight)	
Nuclide*	Preventive Level (uCi/l)	Emergency Level (uCi/l)	Preventive Level (uCi)	Emergency Level (uCi)	Preventive Level (uCi/kg)	Emergency Level (uCi/kg)
I-131 (thyroid)	0.012	0.12	0.09	0.9	0.27	2.7
Cs-137 (whole body)	0.34	3.4	7	70	3.5	35
Sr-90 (bone)	0.007	0.08	0.2	2.0	0.7	7
Sr-89 (bone)	0.13	1.3	2.6	26	13	130

* If other nuclides are present, Reg. Guide 1.109 will be used to calculate the dose to the critical organ(s). Infants are the critical segment of the population.

TABLE ENV-3H.2 (cont'd)

GUIDELINES FOR PROTECTION AGAINST INGESTION OF CONTAMINATION

RECOMMENDED PROTECTIVE ACTIONS

Preventive Level	Emergency
1. Removal of lactating dairy cows from contaminated pasture and substitution of uncontaminated stored feed.	Isolate feed and water from its introduction into commerce after considering:
2. Substitute source of uncontaminated water.	a. availability of other possible actions;
3. Withhold contaminated milk from market to allow radioactive decay.	b. importance of particular food in nutrition;
4. Divert fluid milk to production of dry whole milk, butter, etc.	c. time and effort to take action;
	d. availability of other foods.

References

U.S. Food and Drug Administration, 21 CFR Part 1090, Federal Register, Vol. 43, No. 242, Dec. 15, 1978.

WISCONSIN PUBLIC SERVICE CORPORATION	NO. EP-RET-3D	REV. A
Kewaunee Nuclear Power Plant	TITLE: Containment Air Sampling Analysis Using CASP	
EMERGENCY PLAN IMPLEMENTING PROCEDURE	DATE: JUN 2 1 1983	PAGE 1 of 6
REVIEWED BY W S Winnowski M L Marchi	APPROVED BY [illegible]	

1.0 PURPOSE

Containment samples will be drawn and analyzed following an Alert, Site, or General Emergency, or when directed by the Radiation Protection Director (RPD).

2.0 APPLICABILITY

2.1 This procedure is to detail the requirements, considerations, and operations of the Containment Air Sample Panel (C.A.S.P.) during a post LOCA condition, to obtain a grab sample of containment air for gross gas analysis, Iodine analysis, and oxygen analysis.

3.0 PRECAUTIONS

3.1 Process an Emergency Radiation Work Permit (see EP-AD-11)

3.2 Contact Health Physics Dept. for:

a. Proper personnel dosimetry
b. Proper radiation detection instrumentation
c. Personnel for continuous HP coverage during sampling
d. Remote area monitor readings in area of HRSR.

3.3 Utilize onsite communications with the Radiological Protection Director as necessary, during sampling.

3.4 Any sample drawn from the post accident containment atmosphere should be assumed to contain specific activity of the following magnitude:

GAS	5.0 Millicuries/cc
IODINE	0.2 Millicuries/cc

4.0 EQUIPMENT

All necessary equipment shall be on hand prior to beginning to sample the containment atmosphere. This equipment includes:

4.1 Operable C.A.S.P. System with ISC Cart in #1 Sample Station

4.2 A 5.0 microliter gas syringe (2)

4.3 a 1.0 cc gas syringe

4.4 An iodine cartridge holder (1)

4.5 Silver Zeolite Cartridges (1)

4.6 Several small rubber stoppers (3-4)

4.7 Portable shields for use when transporting syringes for counting.

4.8 A 4.0 liter Marinelli Beaker (in Count Room)

5.0 PROCEDURE

5.1 Containment Air Sample Panel Operation

5.1.1 Proceed to HRSR per HP/RPD recommendations.

5.1.2 Check ventilation on and in "normal" position and high vacuum lights indicate "normal" for the LSP and CAP, and CASP. Check valve lineup per Attachment 1.

5.1.3 Check radiation levels in HRSR and in maintenance area behind panels if access is required.

5.1.4 Insure that N_2 supply regulator is set at 150 PSI and bottle contains at least 500 psig N_2.

5.1.5 Verify that CASP and CASP Control Panels are energized and operational. Ensure that the heat tracing is on.

5.1.6 Check the ISC sample cart in the #1 position and lock in place. Check cart is properly locked in by trying to pull away.

NOTE: Only Sample Station 1 should be used for Iodine Analysis.

5.1.7 Call Control Room and verify Dome Fans 1A and 1B are operational.

5.1.8 Have Control Room Operator open 1 set of the following valves:

Loop A	Loop B
LOCA-2A	LOCA-2B
LOCA-10A	LOCA-10B
SA 700-3A	SA 700-3B

5.1.9 Insure that when selecting sample loop A or B that either hydrogen monitor is not operating or loop selected is opposite that being used by H_2 monitor. Open AS110A or AS110B.

5.1.10 CASP two minute pre-sample back flush

SV-10 OPEN
SV-6 OPEN
SV-5 OPEN

Insure flow monitor on CASP is indicating flow

5.1.11 Three minute sample purge:

AV-1/SV 1.2 Open
SV-5 Closed
AV-2 Open

Open manual inlet, (V-4) and outlet (V-6) valves and close manual bypass valve (V-5) on I.S.C. Insure CASP Flow Monitor is indicating flow.

5.2 Sample Collection

5.2.1 SV-6 Closed. . Flow Monitor on CASP should go out. Wait 1 minute for pressure equalization.

5.2.2 Withdraw a one cc sample and two 5 microliter samples of the containment atmosphere from the I.S.C. and place them in a portable shield for transport to the count room. Insert the needle of each syringe into a small rubber stopper to prevent leakage.

5.2.3 Using a predetermined route to minimize personnel exposure, transport the shielded samples to the count room for analysis, after completing Step 5.3

5.3 System Shutdown and Cleanout

5.3.1 Shut AS110A or AS110B.

5.3.2 Open SV-6, to evacuate the I.S.C. cart for 2 minutes.

5.3.3 Shut I.S.C. cart inlet valve (V-4) and outlet valve V-5. Open bypass valves (V-6).

5.3.4 Open AS110A or AS110B and shut AV-2. Continue this backflush for 2 minutes. Flow monitor should indicate flow.

5.3.5 Open SV-5, shut AV-1/SV1.2. Continue this backflush for 1 minute. Flow monitor should indicate flow.

5.3.6 Shut SV-10, SV-6, SV-5, and AS110A or AS110B.

5.3.7 Call Control Room and have containment isolation valves selected in step 5.1.8 closed.

CAUTION: Make sure correct set is closed to avoid damaging hydrogen monitors.

5.3.8 After cart is flushed, reset "Active/Inactive" indicator lights to Inactive mode.

5.4 Gross Gas Analysis

5.4.1 Perform background radiation surveys in the count room and ensure that the multi-channel analyzer (MCA) is operable.

5.4.2 Place a Marinelli beaker on the GeLi detector and run a 5 minute background count. Record the % dead time indication.

5.4.3 After the background count, remove the Marinelli from the count cave and inject 5 microliters of sample into it. Replace on the GeLi and count for one minute using the standard Marinelli Q>T table. Expected results are approximately 5.0 E - 3uCi/cc for Xe-133 at 5% dead time under negligible background radiation conditions.

5.4.4 Dilution factor when injecting 5.0 microliters into a 4.0 liter Marinelli is 8.0 E + 5. Determine gaseous isotopes using the following formula:

$$(\text{Printout Activity in uCi/cc}) \times (8.0\ E + 5) = \text{Gaseous Activity in Containment in uCi/cc}$$

5.4.5 If the count room is uninhabitable or if the multi-channel analyzer is saturated from background radiation and inoperable, the sample may have to be sent to Point Beach for counting. In this case, instead of injecting the 5.0 microliters of sample into a Marinelli beaker, inject it into a 1.0 liter poly bottle. The bottle may then be counted for gross gas activity at Point Beach in the liter bottle geometry. If this is done, use a dilution factor of 2.0 E + 5 to determine actual activity in containment.

5.5 Iodine Analysis

5.5.1 Place a Silver Zeolite sample cartridge in a holder. Attach a hose from the holder to a vacuum source and establish air flow through the filter cartridge.

5.5.2 Inject 5.0 microliters of the samples gas upstream of the filter cartridge allowing the gas to flow through the Silver Zeolite cartridge.

5.5.3 Remove the Silver Zeolite cartridge from its holder and monitor it for radiation.

5.5.4 Insert the CESCO NFRU Q>T table on the MCA.

5.5.5 Run a 5 minute background count on the MCA.

5.5.6 Place the Silver Zeolite cartridge on the GeLi detector and perform a one minute sample count. Activity results will be in uCi/cc times 1.00 E-6.

5.5.7 If the count room is inaccessible, the cartridge may be sent to Point Beach for analysis. They use an identical geometry for counting iodine samples.

5.6 Hydrogen and Oxygen Analyses

5.6.1 Refer to chemistry procedure RC-C-61, Operation of the Gas Partitioner.

5.6.2 Ensure that the gas partitioner is turned on, the Argon flow is 30-35 cc/min., the cell power switch is on, and the heater switch and chart recorder are on.

5.6.3 Once everything is set up on the gas partitioner inject the contents of the 1.0 cc syringe into the gas partitioner and await results on the chart recorder.

5.6.4 Report all results obtained to the Radiological Protection Director.

VALVE LINEUP SHEET

CASP Control Panel

AV-1/SV-1.2	Smpl Pos #1	Inlet/Outlet	CLOSE
SV-2.1/SV-2.2	Smpl Pos #2	Inlet/Outlet	CLOSE
SV-3.1/SV-3.2	Smpl Pos #3	Inlet/Outlet	CLOSE
SV-4.1/SV-4.2	Smpl Pos #4	Inlet/Outlet	CLOSE
SV-5	Smpl Bypass		CLOSE
SV-10	Nitrogen to Eductor		CLOSE
AV-2	Return to Containment		CLOSE
SV-6	Eductor Suction Iso		CLOSE

(At Sample Acquisition Panel)

I	AS110A	Cont Air Smpl A Isol	CLOSE
I	AS110B	Cont Air Smpl B Isol	CLOSE