NUCLEAR SUPPORT SERVICES DEPT NORTHERN STATES POWER COMPANY	CORPORATE NUCLEAR EMERGENCY PLAN IMPLEMENTING PROCEDURE NUMBER: REV: 11
PREPARED BY: Gary Hudson Asst. Adm. Emergency Preparedness	EFFECTIVE DATE: FEBRUARY 17, 1983
REVIEWED BY: EC Ward Manager Nuclear Environmental Services	TITLE: TABLE OF CONTENTS RECORD OF REVISION
APPROVED BY: General Manager Nuclear Plants	

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NUCLEAR SUPPORT SERVICES DEPT NORTHERN STATES POWER COMPANY	CORPORATE NUCLEAR EMERGENCY PLAN IMPLEMENTING PROCEDURE NUMBER: EPIP 1.1.10 REV: 4
PREPARED BY: Gary Hudson Asst. Adm. Emergency Preparedness	EFFECTIVE DATE: February 17, 1983
REVIEWED BY: E Ward Manager Nuclear Environmental Services	TITLE: 1.1.10 OFFSITE SURVEYS
APPROVED BY: General Manager Nuclear Plants	

1.0 PURPOSE AND OBJECTIVES

This procedure specifies the method of staffing the offsite survey teams for the Corporate Emergency Response Organization, the means by which monitoring equipment and supplies will be obtained, the methods to be employed by the offsite survey teams, and the monitoring and recording of field survey data.

2.0 CONDITIONS AND PREREQUISITES

2.1 The Emergency Manager has requested an offsite survey, or offsite surveys are in progress by plant personnel.

2.2 An airborne or liquid release has occurred, is occurring, may occur or all releases have been terminated and the post accident Recovery Phase has commenced.

3.0 ORGANIZATION AND RESPONSIBILITIES

3.1 Overall Responsibility - Emergency Manager

3.2 In Charge - Radiation Protection Support Supervisor

4.0 DISCUSSION

4.1 Offsite surveys during an emergency are normally performed by sister plant radiation protection specialists when the corporate organization is fully activated. Until that time, these functions are performed by survey teams from the affected plant. The EOF is staffed with personnel who are generally familiar with nuclear facilities and radiation protection practices. These personnel are available to assist the Radiation Protection Support Group as directed by the Emergency Manager.

4.2 The extent and degree of radiological monitoring following a release of radioactive material will depend on the nature, the physical or chemical form, and the radioisotopic composition of the release. The affected plant's personnel will provide information to the Radiation Protection Support Supervisor concerning the extent of airborne and/or liquid releases. This information will determine the areas to be monitored and the protective actions required for monitoring teams.

4.3 At each EOF there is a count room which provides an offsite facility for receipt and analysis of radioactive samples. This count room is staffed by Radiation Protection Specialists from the affected plant who are familiar with its equipment and operation.

5.0 RESPONSIBILITIES

5.1 Radiation Protection Support Supervisor

5.1.1 When notified by his plant's shift supervisor that it is necessary to activate the offsite radiation protection support team, the Radiation Protection Support Supervisor, who is the sister plant Superintendent Radiation Protection or designee, shall be responsible for the organization and equipping of the survey teams prior to departure to the affected plant's EOF.

5.1.2 Provide a briefing and dispatch survey teams to perform appropriate radiological surveys in the general path of the projected or actual plume to confirm dose projection results. Determine the necessary radiation protection for survey teams.

5.1.3 Direct the survey teams to the affected areas along the actual or projected plume path. Direct each team to conduct a plume search, to perform surveys in accordance with the guidelines of this procedure, to record the necessary data, and transmit the results to the EOF using the portable radios. Each team should initially be directed to conduct a plume search and to perform an air sample survey and/or a stationary dose rate survey at each selected location once the plume has been encountered or as directed by the Radiation Protection Support Supervisor. When additional information concerning the type of release is available, the type of monitoring may be modified as circumstances dictate.

5.1.4 If at Prairie Island, consider that plume diversion is likely to occur if the plume is traveling towards the bluffs (Wisconsin and/or Minnesota). Deploy the survey teams to conduct a plume search both beyond the bluffs and down the valley, where plume diversion is likely to occur.

5.1.5 Determine the need for river sampling following a liquid release. Off-Site monitoring in response to a release of radioactive material to the Mississippi River will depend on the nature and extent of the release, whether or not the release has been stopped, and the release path.

5.1.6 Once the significant releases have been terminated and the re-entry phase has commenced;

a. Direct the survey teams to the affected areas to determine the extent of contamination and the areas affected. Each team shall obtain dose rates and contamination levels at each survey point or at areas as directed by the RPSS. Other sampling will be as determined by the RPSS.

b. Direct the survey teams to pick up the emergency TLDs in accordance with EPIP 1.1.12. The location of TLDs is contained on the TLD maps, E-EPD-4.4 (Monticello) and E-EPD-5.4 (Prairie Island).

c. Cartridges and filters may also be collected from air monitoring stations. The air monitoring station locations are included on the maps referenced above.

5.1.7 Upon determination of the emergency condition, direct the survey teams to return all equipment to the Emergency Survey Kits and radiological equipment lockers. Direct that the EOF count room equipment be shut down and the count room returned to a standby status.

5.2 Survey Team Members

5.2.1 Obtain appropriate monitoring equipment from the survey team kits at their storage locations. Obtain and re-zero dosimeters.

5.2.2 Perform operability checks on monitoring and sampling equipment before leaving the EOF area, or sister plant.

a. Calibration date
b. Response check
c. Re-zero

5.2.3 Obtain a portable radio and operationally check the radio before leaving the sister plant EOF to start the survey. Keep the radio operational at all times while performing surveys in order to maintain communications with the EOF.

a. Sister plant survey teams should operationally check the radios and attempt to contact the EOF when approaching the boundary of the 10 mile EPZ.

b. Since radio communications can be intercepted by commercially available scanners, all communications must be brief and factual and free of exclamatory or alarming expressions.

c. Carefully word data transmissions to minimize possible confusion. In particular, avoid abbreviations such as "mREM" which could be confused with "REM". ALL DOSE OR DOSE RATE NUMBERS TRANSMITTED SHOULD BE IN UNITS OF MILLIREM OR MILLIREM PER HOUR.

5.2.4 If so directed or if airborne activity or contamination is suspected, obtain protective clothing and equipment at the EOF and take appropriate protective actions.

5.2.5 Conduct a search for the plume when departing the EOF or when approaching the boundary of the 10 mile EPZ (if determined, from initial radio contact with the EOF, that the plume may be encountered while arriving at the EOF).

5.2.6 Observe the respiratory protection and the field dose rate precautions, as stated in TAB B at all times while conducting a plume search, taking dose rate measurements or taking air samples.

5.2.7 At areas where the plume is encountered, or at each designated survey point, perform surveys in accordance with applicable procedures, as directed by the Radiation Protection Support Supervisor.

5.2.8 Identify survey locations using either:

a. Predesignated survey location numbers, as shown on the applicable Radiological Sampling Points map; or

b. Known landmarks, road intersections, grid coordinates, etc. to identify locations the plume is encountered and/or sampling is done when not at a predesignated survey point.

NOTE: Map coordinates and/or locations should also be identified as per the mobile sampling locations list.

5.2.9 The survey team should accurately document all survey data on an Emergency Sample Results Log, Figure 1. Enter the date, time, name of surveyor, instrument serial number, and model for each survey entry.

5.2.10 Frequently check personal dosimeters and request relief if cumulative exposure approaches administrative control levels as specified in EPIP 1.1.17 " Personnel Monitoring at the EOF".

5.2.11 Once the release has been terminated and the re-entry phase has been implemented, the survey teams shall determine the extent of contamination in affected areas, the size of the affected area and perform sampling as determined by the RPSS.

6.0 PROCEDURE

6.1 Organization and Equipping of Offsite Survey Teams

6.1.1 Prior to departing to the affected plant, an offsite survey group consisting of a minimum of three radiation protection specialists and one individual qualified to perform Radiation Protection Support Supervisor duties shall be assembled by the sister plant Superintendent Radiation Protection or his designee.

6.1.2 The members shall be organized into two, two-man survey teams, with each team having at least one Radiation Protection Specialist assigned. The second member of each survey team will be assigned by the EOF Coordinator and should serve as a driver and assistant to the Radiation Protection Specialist assigned to that survey team. It is not essential that the second member be qualified as a radiation protection technician and they may be any NSP employee. The remaining technicians may be assigned to survey teams, or to the accident assessment team in the EOF as directed by the Radiation Protection Support Supervisor.

6.1.3 Each survey team shall obtain an offsite survey team kit which contains the equipment listed in Tab A. This equipment shall be specifically designated for offsite surveys and will be used by offsite monitoring teams for the duration of the emergency.

6.1.4 Obtain necessary transportation vehicles. These vehicles must be available for the offsite survey teams after arrival at the affected plant's EOF. It is undesirable that these vehicles be personal automobiles. Every effort should be made to obtain NSP trucks or automobiles.

6.1.5 Equipment Operation

a. Survey instruments shall be operated in accordance with standard procedures for each instrument type. General guidelines for all survey instruments shall be as follows:

1) Calibrated within specified interval
2) Response checked satisfactorily
3) Meter zeroed

b. Since Minnesota has severe winter conditions which can seriously affect instrument readings, the following guidelines have been developed to eliminate most cold weather instrument problems:

1) Allow the instrument to completely warm up. This should take about 2 minutes. Do this indoors or in a car.

2) If outside temperature is greater than 32°F (0°C), instrument use is unlimited.

3) If the outside temperature is between 32°F (0°C) and 0°F (-18°C), any instrument should be used for no more than 5 minutes.

4) If the outside temperature is between 0°F (-18°C) and -20°F (-28°C), any instrument should be used for no more than 2 minutes.

5) If the outside temperature is below -20°F (-28°C), no instrument should be used unless special batteries (alkaline or Ni-Cd) are in the instruments and this would increase the temperature range to -40°F (-40°C). The instrument should only be used for very short times (less than 30 seconds).

6.2 Types of Samples

6.2.1 At each sample point the following samples may be made:

a. Air Sample - gaseous, particulate and radioiodine
b. Stationary Dose Rate Survey

6.2.2 Special samples to be taken as directed by Radiation Protection Support Supervisor.

a. Liquid samples

6.2.3 Re-entry phase monitoring and sampling will be as directed by the RPSS.

a. Stationary dose rate survey.
b. Smear survey.
c. Snow samples.
d. Emergency TLD pickup.
e. Air monitoring stations.

6.2.4 If it is necessary to increase the normal sampling frequency of REMP, implement EPIP 1.1.12, Implementation of the Radiological Environmental Monitoring Program".

a. Air particulates & Radioiodine (air monitoring stations)
b. TLD
c. Milk
d. Well water
e. Drinking water

f. Mississippi River water
g. Cultivated crops
h. Fish and Invertebrates
i. Bottom sediment - River
j. Shoreline sediment

6.3 Sampling Procedures

6.3.1 Plume Search Technique

a. Equipment required

1) Radiation Survey Instrument (RO-2, or equivalent, with Beta Correction Factor)
2) Sample Results Log (Figure 1)
3) Pen and/or pencil

b. Procedure

1) When departing the EOF, or approaching the boundary of the 10 mile EPZ;

a) Energize the instrument, observing proper precautions for cold weather. Note: All instruments should be response checked prior to entry in the field.

b) Allow the instrument to stabilize (approximately 30 seconds), then zero the meter.

2) Perodically hold the instrument out the vehicle window, while in transit, and watch the instrument for a meter deflection

Note: During inclement weather the instrument may be placed against the inside vehicle window or on the dash.

3) When a meter deflection is observed, stop the vehicle and perform a beta and gamma survey of the area as follows:

a) Hold the instrument at approximately 1 meter (3 feet) from ground level and scan around the area for maximum meter deflection.

b) Open the probe window for beta gamma reading.

c) Record the "window open" reading (Figure 1).

d) Close the probe window.

e) Record the "window closed" reading (Figure 1).

f) Determine the corrected beta reading.

4) Record the readings and calculate the beta and gamma dose (Figure 1).

Note: A beta plus gamma reading will indicate that the plume has been encountered. A gamma reading with zero beta reading indicates the plume is elevated or displaced. A gamma reading and a beta reading indicates that the plume is at ground elevation.

5) Report the results to the Radiation Protection Support Supervisor as follows:

a) Location: _____
b) _____ millirem/hr gamma
c) _____ millirem/hr True Beta

Note: If not at a predesignated survey point, use known landmarks, road intersections, grid coordinates, etc., to identify the location.

6.3.2 Air Sample

a. Equipment required

1) Battery powered or generator powered air sampler
2) Fiberglass particulate filter
3) Silver zeolite
4) RM-14 or equivalent
5) 2" GM pancake probe
6) Watch or clock
7) Plastic bags
8) Sample labels
9) Pen and/or pencil
10) Sample Logs (Figure 1)
11) Stainless Steel gas sampler

b. Particulate and Radioiodine Procedure

1) Install the particulate filter and silver zeolite absorber into the air sampler cartridge/filter holder.

2) Start the air sampler. Record the start time and sample location/or survey point as applicable on Emergency Sample Results Log (Figure 1). Record the flow rate through the sampler.

3) When the desired sample time has elapsed, record sample volume and stop the air sampler. The sample should be a standard 25 cubic foot sample, (7.07×10^5 cc or approximately 10 minutes). Record the stop time.

4) Carefully remove the particulate filter and silver zeolite absorber and place samples in separate plastic sample bags.

5) Place a sample label on the sample and ensure that all information is completed.

   a) Sample time and date
   b) Location of sampler
   c) Volume of sample

6) Make gross activity estimates in the field by the following methods:

   a) Particulate Activity - count the particulate filter using An RM-14 (or equivalent) with a 2" GM pancake probe. Estimate the gross particulate activity using the following formula:

$$\text{Activity (uCi/cc)} = \frac{\text{(Background Corrected Count Rate)}(4.5 \times 10^{-7}\text{uCi/dpm})}{\text{(Probe Efficiency) (Sample Volume; cc's)(cf)}}$$

   NOTE 1: Probe efficiency = 0.1 for RM-14 with a 2" GM pancake probe.

   NOTE 2: Place 2" GM pancake probe about 1/8" from the filter, with filter outside poly bag.

   NOTE 3: CF = Correction factor for sample. CF is 0.3 for 4 inch paper counted with a 2 inch probe.

   b) Iodine Activity - count the silver zeolite absorber using an RM-14 or equivalent. Calculate sample activity using the following formula:

$$\text{Iodine Activity (uCi/cc)} = \frac{\text{(uCi's on absorber)}}{\text{(Sample Volume in cc's)}}$$

   NOTE 1: Where uCi's on absorber = activity on absorber determined from Figure 2 using the corrected countrate.

   NOTE 2: If background exceeds 1000 CPM, notify the Radiation Protection Support Supervisor and proceed to an area of lower background (less than 1000 CPM) for counting, if so instructed.

NOTE 3: Place 2" GM pancake probe directly on absorber, with absorber inside poly bag.

c. Gaseous Activity Procedure

1) Remove the stainless steel gas chamber, suction bulb and filter assembly from the survey kit.

2) Install a clean filter in the filter assembly.

3) Connect filter assembly such that air passes through the filter to the gas chamber, then to the suction bulb.

4) Open the stop cocks on the gas chamber.

5) Squeeze the suction bulb ten (10) times to obtain a representative sample.

6) Shut the stop cocks on the gas chamber.

7) Using an RM-14 or equivalent and a 2 inch GM pancake probe obtain a count rate of the chamber volume by placing the probe over the mylar window. Log the result as "gross CPM".

8) Obtain a second chamber labeled "Background". Do not open the stop cocks of the background chamber. Determine a background count rate by placing the 2 inch GM pancake probe over the mylar window. Log the result as "Background CPM".

9) Determine the "Net CPM" by subtracting the "Background CPM" from the "Gross CPM".

10) Apply the net count rate to the curve in Figure 4 to determine the concentration, uCi/cc, of Xe^{133} equivalent. Log this result on Figure 1 as uCi/cc.

d. Recording

1) Record the air sample results on the Emergency Sample Results Log, (Figure 1) and report the results to the Radiation Protection Support Supervisor using the portable radio.

2) As directed by the Radiation Protection Support Supervisor save the sample for future analysis. The central collection point for offsite samples is the EOF countroom or as directed by the Radiation Protection Support Supervisor.

6.3.3 Stationary Survey

a. Equipment required

1) Radiation Survey Instrument (RO-2, or equivalent, with Beta Correction Factor)
2) Sample Results Log (Figure 1)
3) Pen and/or pencil

b. Procedure

1) Before arrival at the designated survey point:

a) Energize the instrument, observing proper precautions for cold weather. Note: All instruments should be response checked prior to entry in the field

b) Allow the instrument to stabilize (approximately 30 seconds), then zero the meter.

2) Upon arrival at one of the designated survey points, perform a beta and gamma survey of the area as follows:

a) Hold the instrument at approximately 1 meter (3 feet) from ground level and scan around the area for maximum meter deflection

b) Open the probe window for beta gamma reading

c) Record the "window open" reading (Figure 1)

d) Close the probe window

e) Record the "window closed" reading (Figure 1)

f) Determine the corrected beta reading

3) Record the readings and calculate the beta and gamma dose (Figure 1)

4) Report the results to the Radiation Protection Support Supervisor as follows:

a) Location: _____
b) _____ millirem/hr gamma
c) _____ millirem/hr True Beta

6.3.4 Liquid samples

a. Equipment required

1) one liter sample bottles
2) river sampling apparatus
3) labels
4) pen
5) plastic bags
6) survey instrument
7) tape

b. Procedure

1) Cast poly bottle into the water to be sampled
2) Allow bottle to fill completely, then withdraw
3) Label and bag the sample bottle
4) Make a gross estimate of the bottle activity as follows:

a) Use a RM-14, or equivalent with a 2" GM pancake probe to measure activity
b) Place probe on the bottle side as shown in Figure 3
c) Determine the gross activity using the graph shown in Figure 3
d) Save the sample for further analysis
e) Report results to the Radiation Protection Support Supervisor at the EOF by portable radio
f) Record the results on the Emergency Sample Results Log (Figure 1)

5) The central collection point for offsite samples is the EOF count room or as specified by the Radiation Protection Support Supervisor.

c. Monticello locations

1) Initial surveys of liquid releases will be taken by plant personnel at the plant discharge canal, and the Monticello Bridge. The sister plant offsite survey teams will relieve the plant team taking continuous samples at the Monticello Bridge. Required sample frequency will be specified by the Radiation Protection Support Supervisor.

2) Additional liquid surveys may be requested by the State or the Emergency Manager. Locations for these surveys shall be specified at that time. Specific downstream locations for further surveys are:

a) Elk River Bridge
b) Anoka Bridge
c) Minneapolis & Saint Paul drinking water intakes

d. Prairie Island locations

1) Initial samples of liquid release will be taken by plant personnel at the Eisenhower Bridge, the plant discharge canal, and Lock and Dam #3. The sister plant offsite survey teams will relieve plant teams taking continuous samples at the Eisenhower Bridge and Lock and Dam #3. Required sample frequency will be specified by the Radiation Protection Support Supervisor.

2) Additional liquid samples may be requested by the State or the Emergency Manager. Locations of additional surveys will be specified at that time.

6.3.5 Contamination Survey

a. Equipment Required

1) Two (2) inch cloth smears and plastic bags
2) RM-14 with 2" pancake probe or equivalent

b. Procedure

1) Obtain two (2) inch cloth smears and plastic bags.
2) Number the smears.
3) Don protective clothing appropriate for the situation to be expected.
4) Proceed to the area to be surveyed.
5) Write smear number on survey map for applicable location to be smeared.
6) Swipe an area by applying moderate pressure along a line or shape, 15 to 18 inches in length.

NOTE: Surfaces to be smeared should be smooth (e.g. cars, mail boxes, etc.)

7) Fold the smear folder in half and place in a poly bag.
8) Count the smears in a low background area, using an RM-14 (frisker), as follows:

a) Obtain background counts from frisker.
b) Cover work area with poly or absorbent paper to prevent spread of contamination.
c) Remove the smears from the poly bags.
d) Hold the frisker probe approximately 1/8 inch above the smear to obtain the total counts.

NOTE: Take care not to contaminate the probe.

e) Calculate the smearable activity as follows:

$$dpm/100cm^2 = \frac{\text{Total CPM - BKGD CPM}}{(\text{Frisker Efficiency})(0.10)}$$

NOTE: (1) Contamination limits greater than 100,000 $dpm/100cm^2$ requires respiratory protection.
(2) .10 is smear efficiency.

f) Log smear results, including date and time on an Emergency Sample Results Log, Figure 1; and report results to the RPSS.

6.3.6 Snow Samples

a. Equipment Required

1) Poly bags
2) Snow scoop
3) Spatula

b. Procedure

1) Using snow scoop, remove surface snow from area to be sampled. (To a depth of approximately 1cm)
2) Place snow in poly bag and seal.
3) Arrange to transport snow sample to EOF Count Room for analysis.
4) Calculate ground contamination as follows:

$$\frac{pCi}{m^2} = \frac{(\text{Total uCi's in Sample})(10^6\ pCi/uCi)}{(\text{Area of Snow Sample } cm^2)(1X10^{-4}\ M^2/cm^2)}$$

6.3.7 Emergency TLD and Air Monitoring Station Samples

If releases have been terminated, direct the field survey teams to obtain the Emergency TLDs and air monitoring station cartridges and filters in accordance with EPIP 1.1.12.

NOTE: The Administrator REMP or his designee shall arrange for contract laboratory service of TLDs in accordance with EPIP 1.1.12.

Figure 1

EMERGENCY SAMPLE RESULTS LOG

DATE _____

TIME		Survey Point	SAMPLE RESULTS							DOSE RATE RESULTS - mREM/hr			Instrument
Start	Stop		Sample Flow Rate	Sample Volume (cc)	Gross CPM	BKGD CPM	Net CPM	uCi/cc	Sample Type*	WINDOW Open Beta-Gamma	WINDOW Closed Gamma	TRUE BETA (See back for formula)	Model / Serial Number

1. Formulas listed on back
2. Remarks:

*Sample type includes: Particulate, Gaseous, Radioiodine, Liquid, Area Dose Rate

_____
TECHNICIAN SIGNATURE

Figure 1
(reverse side)

Formulas:

1. Gross Counts Per Minute - Background Counts Per Minute = Net Counts Per Minute

   CPM(gross) - CPM(bkgd) = CPM(net)

2. Cubic feet x 2.83 x 10^4 = cubic centimeters

   $Ft^3 \times 2.83E4 = cc$

3. $$uCi/cc(particulate) = \frac{[CPM(net)]\ [4.5E\text{-}7\ uCi/dpm]}{[inst.\ eff.]\ [sample\ vol.(cf)][2.83E4][CF]}$$

   NOTE: See notes 2 and 4 below.

4. TRUE BETA = (WINDOW OPEN READING - WINDOW CLOSED READING) X Beta Correction Factor - (see Note 1)

NOTES:

1. Assume 5.0 if correction factor is unknown
2. Instrument efficiency depends on probes. If using 2" GM pancake probe, ASSUME 10% (0.10) efficiency; if using GM tube probe, ASSUME 2% (0.02) efficiency.
3. List factors affecting reading; height of probe, reading inside vehicle, etc.
4. CF (Correction factor for air samples) = 0.3 for a 4 inch filter size paper counted with a 2 inch GM pancake probe

FIGURE 2
GROSS IODINE CURVE USING RM-14 WITH 2" GM
PANCAKE PROBE WITH SILVER ZEOLITE ABSORBER

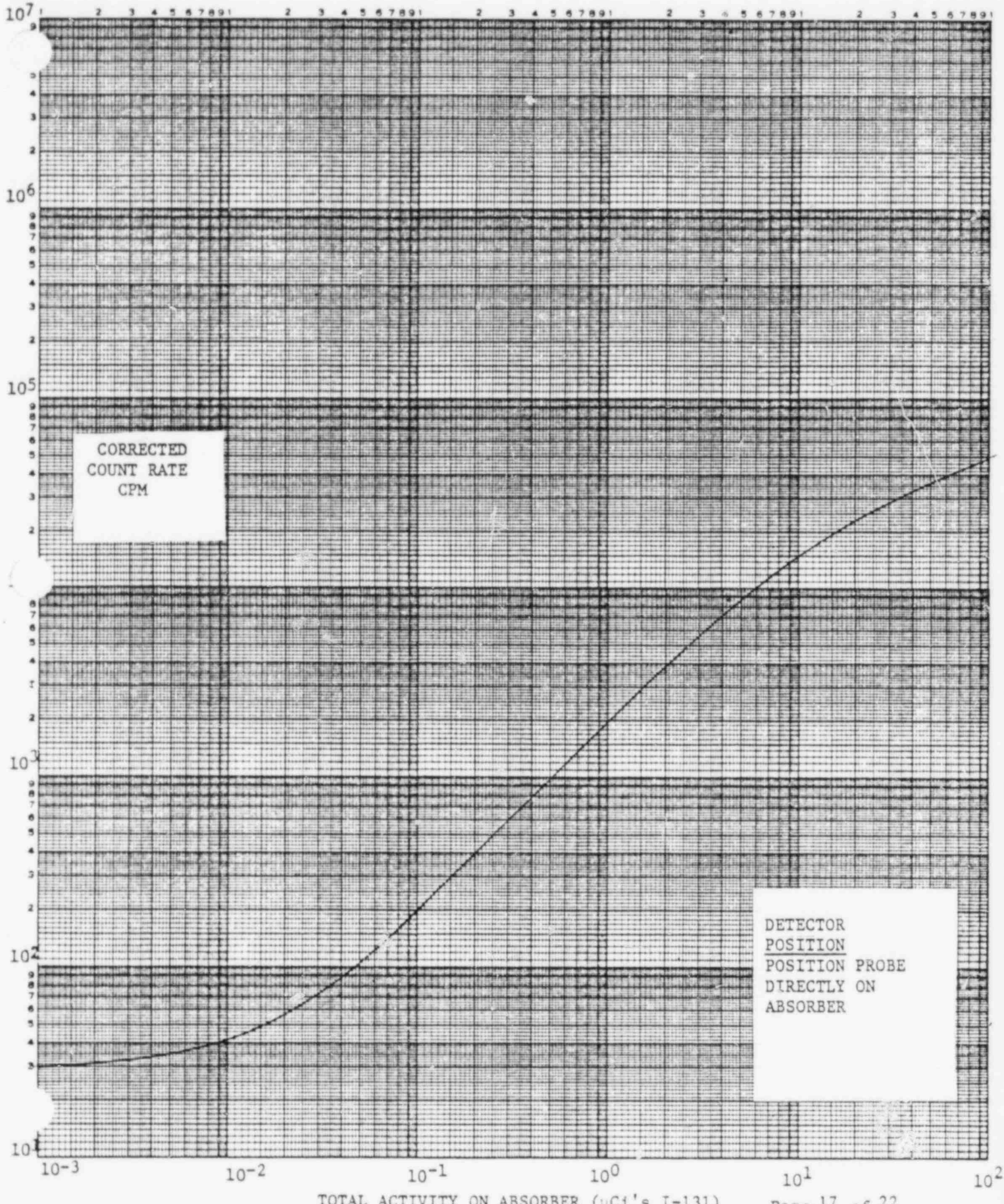


FIGURE 3

GROSS LIQUID ACTIVITY CURVE

USING RM-14 WITH HP-210 PROBE

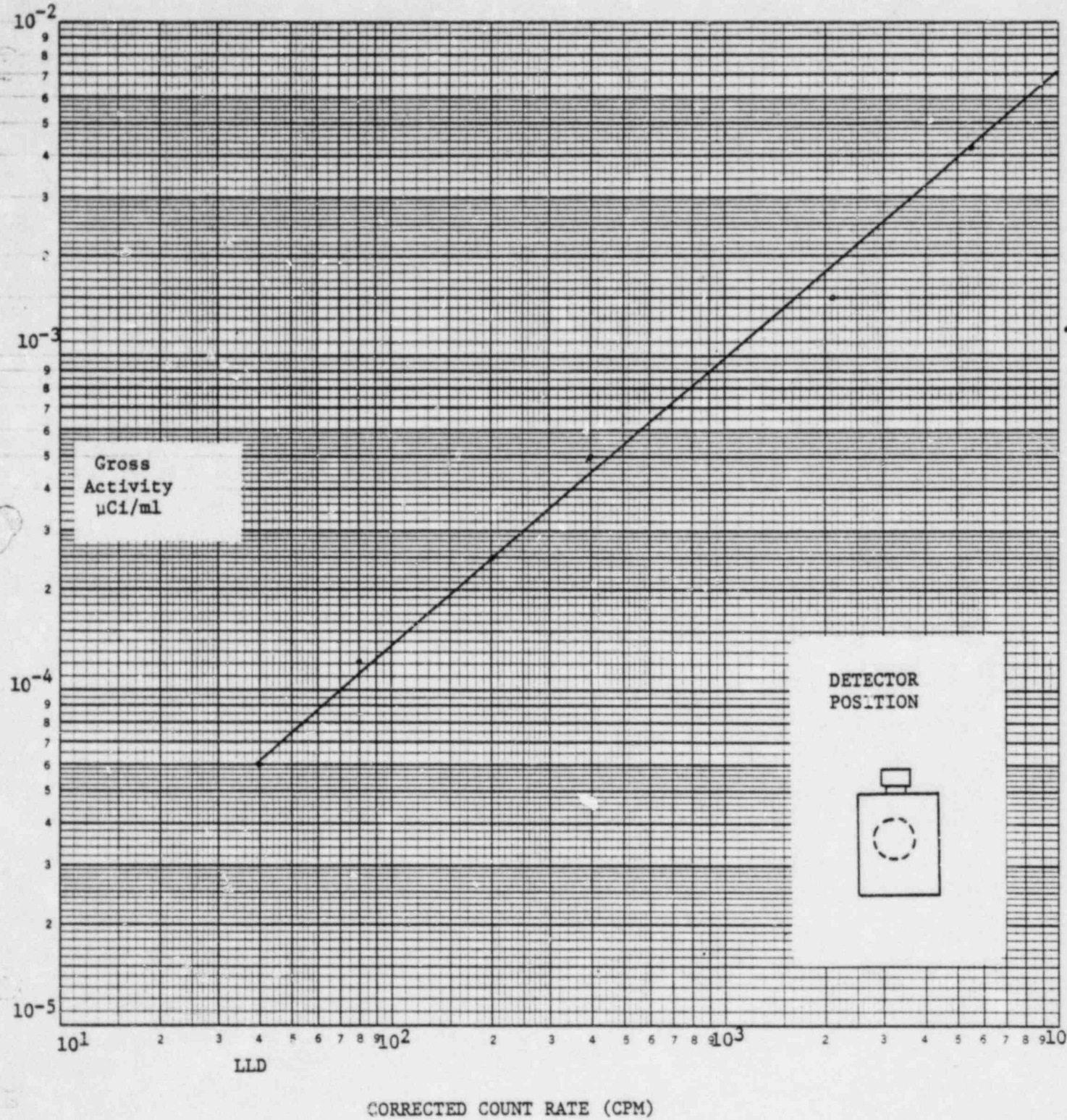
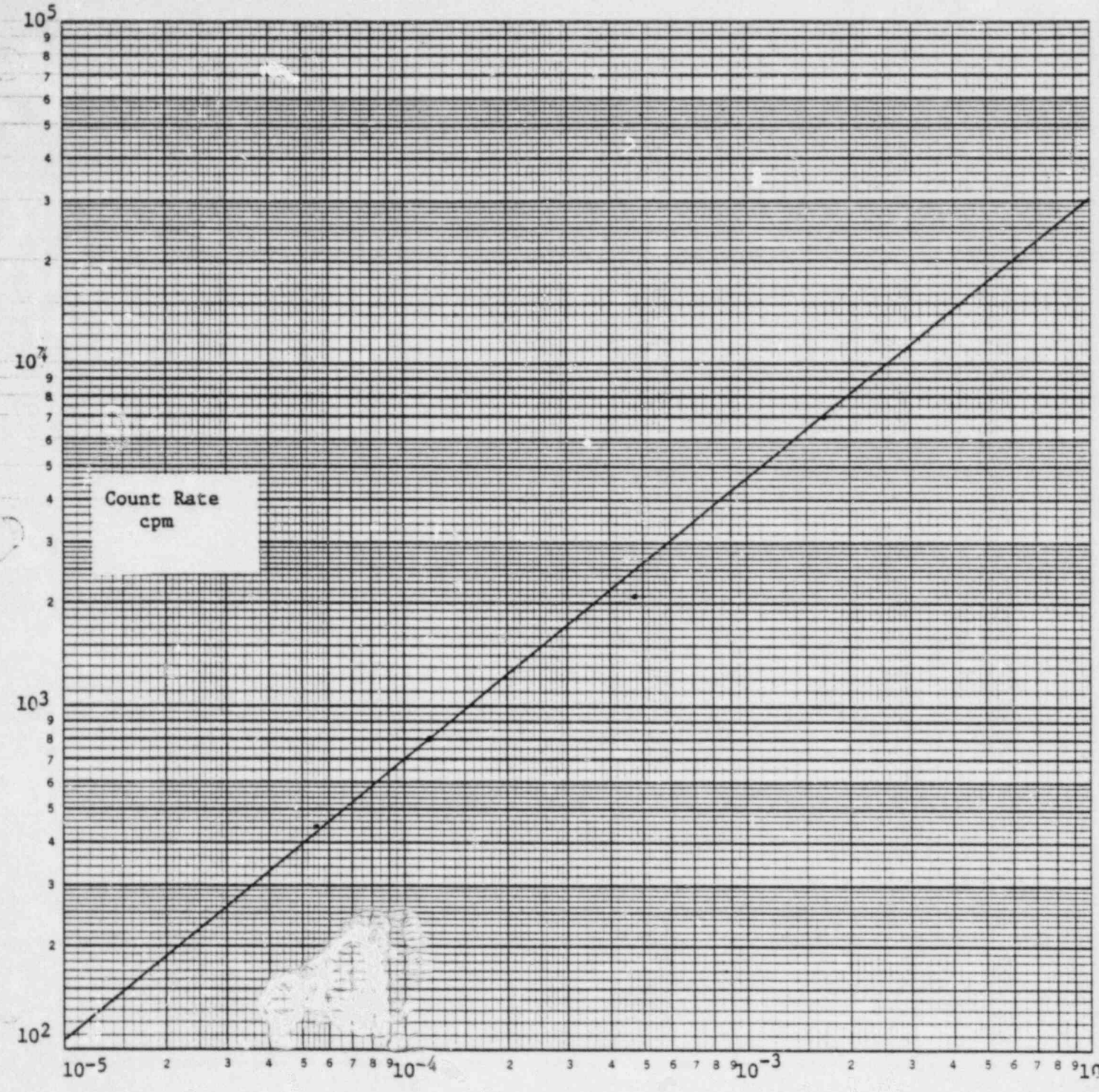


FIGURE 4

GAS CHAMBER CALIBRATION CURVE

(100 cc S.S.)



TAB A

OFFSITE SURVEY TEAM EQUIPMENT PACKAGE

1. Each offsite survey team shall be equipped with a kit of the following:

QUANTITY	REQUIRED ITEM
1	Dose rate instrument RO-2 or equivalent
1	Count rate instrument RM-14 or equivalent
1	2" GM pancake probes
1	Battery powered air sampler
2	Personnel self-reading dosimeters (low range)
2	Personnel self-reading dosimeters (high range)
2	TLDs (if individuals have a normally assigned TLD they should wear those assigned)
1 (package)	Plastic Sample Bags (approx. 100)
1 (box)	Garbage bags (approx. 10)
1 (package)	Paper towels or handiwipes
2 (roll)	Masking tape
20	Silver zeolite cartridges
2	GMR-I Cannisters
2	Full Face Respirators
2	Gas Sample Chambers
1	Filter assembly (gas sampler)
1	Suction bulb (gas sampler)
1 (package)	Filter paper (gas sampler)
10	One liter poly bottles
1	Box air sampler filter papers
1 (package)	Survey sample labels (approx. 30)
1	Portable radio
1	Portable radio antenna
1	Flashlight
4	D-Cell batteries
1	Compass
1	Clipboard
2	Pens
1	Pad of paper (8 1/2" x 11" minimum size)
1	Road map of State of Minnesota
1	Road map of State of Wisconsin
1	Umbrella
1	Watch or clock
1	Calculator
2 (pair)	Foul weather (rain) gear
1	Line (approx. 100 feet)
1	Weighted poly bottle holder
4 (pair)	Protective gloves
30	Smear papers
1	Snow scoop
1	Emergency Plan Drawings Binder (see #2 next page)

TAB A (continued)

OFFSITE SURVEY TEAM EQUIPMENT PACKAGE

2. The Emergency Plan Drawings Binder:

   a) Prairie Island Radiological Sampling Points Map (E-EPD-5.1) and related list of location descriptions

   b) Monticello Radiological Sampling Points Map (E-EPD-4.1) and related list of location descriptions

   1 Copy of EPIP 1.1.10, "Offsite Surveys"
   10 Emergency Sample Results Forms EPIP 1.1.10 Figure 1

TAB B

SURVEY TEAM RADIATION PROTECTION GUIDELINES

I. Respiratory Protection

(1) Radiation Survey Team members should don respirators with GMR cannisters if the following conditions occur:

(a) A General Emergency is declared and the affected sectors have been evacuated; and

(b) Measured dose rates are more than 100 mR/hr Beta.

(2) Respiratory equipment may be removed if the following is indicated:

(a) field measurement of gross iodine activity indicates less than 1E-7 uCi/cc; or

(b) the Radiation Protection Support Supervisor indicates that no significant iodine is or has been released from the plant.

II. Plume Dose Rates

(1) Survey Teams should not linger in areas greater than 100mR/hr.

(2) Survey Teams should not proceed to areas greater than 1 R/hr unless directed by the Radiation Protection Support Supervisor.

(3) Survey Teams SHALL NOT proceed to areas exceeding 10 R/hr.

NUCLEAR SUPPORT SERVICES DEPT NORTHERN STATES POWER COMPANY	CORPORATE NUCLEAR EMERGENCY PLAN IMPLEMENTING PROCEDURE NUMBER: EPIP 1.1.11 REV: 4
PREPARED BY: Gary Hudson Asst. Adm. Emergency Preparedness	EFFECTIVE DATE: FEBRUARY 17, 1983
REVIEWED BY: E C Ward Manager Nuclear Environmental Services	TITLE: 1.1.11 ACCIDENT ASSESSMENT
APPROVED BY: General Manager Nuclear Plant	

1.0 PURPOSE AND OBJECTIVE

The purpose of this procedure is to specify the techniques and methods for data collection and analysis to assess the offsite consequences of an emergency condition. This procedure also provides recommendation guidelines for protective actions based on these assessments.

2.0 CONDITIONS AND PREREQUISITES

An emergency condition has been declared involving the potential for, or an actual release of, radioactive material from an NSP nuclear plant.

3.0 ORGANIZATION AND RESPONSIBILITIES

3.1 Overall Responsibility - Emergency Manager

3.2 In Charge - Radiation Protection Support Supervisor

4.0 DISCUSSION

4.1 Accident assessment is required to ensure that the consequences of any radiological release are evaluated and that recommendations for protective actions are formulated and provided to appropriate state officials. This assessment is a continuous process throughout the duration of an emergency and should be continued as directed by the Emergency Manager.

4.2 The responsibility for accident assessment is initially assigned to the TSC. The Radiological Emergency Coordinator will make evaluations based on actual plant data, and calculated or measured doses. He will formulate protective action recommendations for the Emergency Director and the Emergency Director will inform the state officials of the recommendations.

4.3 After the EOF is activated, the Emergency Manager is responsible for all communication with state and local officials. Therefore, all recommendations for protective actions shall be made to the Emergency Manager. In the initial stages of EOF activation, the Emergency Manager may have assumed the responsibilities for the offsite response prior to the Radiation Protection Support Group's arrival. In this instance, the TSC will continue to provide accident assessment and protective action recommendations. These will be made to the Emergency Manager, who will make appropriate recommendations to the state officials.

4.4 The decision to transfer accident assessment responsibilities from the TSC to the EOF is made by the Emergency Manager. This decision will be based on the type of emergency, the EOF equipment status and the staffing of the Radiation Protection Support Group. When the Emergency Manager has determined that the EOF has the capability to perform accident assessment and formulate protective action recommendations, he will inform the TSC. He will then direct the Radiation Protection Support Supervisor to assume these responsibilities. The transfer of responsibilities shall be closely coordinated with the Radiological Emergency Coordinator. In general, the Radiation Protection Support Supervisor will supply the TSC with information concerning the results of offsite surveys. The Radiological Emergency Coordinator, located at the TSC, will supply the EOF with actual release rates, meteorological data, results of projected offsite doses, and any applicable survey data obtained by plant survey teams. Each organization (offsite and onsite) should compare actual measured doses with projected doses to verify that no undetected releases have occurred and that assumptions made in projections were valid.

4.5 The Radiation Protection Support Supervisor will use the projected dose rates and actual survey results to formulate protective actions. He will inform the Emergency Manager of his recommendations. The Emergency Manager will make the necessary recommendations to state and local officials.

4.6 The Radiation Protection Support Supervisor will provide current information concerning offsite activities to the Radiological Emergency Coordinator, at the TSC. This information is provided for inclusion in the sites projected dose rate computer program and to ensure that the plant is aware of the extent of the offsite releases. Updated dose projections based on this information shall be passed to the EOF to upgrade previous protective action recommendations. This technique for review, reconsideration, and evaluaton of recommendations for protective actions should continue until the response phase of the emergency is complete.

5.0 RESPONSIBILITIES

5.1 Emergency Manager

5.1.1 Direct the Radiation Protection Support Supervisor to assume accident assessment responsibilities. This should be imple-

mented when the Radiation Protection Support Group is fully staffed and transfer of responsibilities will enhance the overall emergency response.

5.1.2 Ensure that the state(s) receive(s) Protective Action Recommendations as required. Guidelines specified in this procedure should form the basis for any recommendations. [Use Figure 1 for transmittal of recommendations to state(s).]

5.1.3 Prior to, or simultaneously with, telecopying a protective action recommendation to the state(s):

- If at Monticello
  Initiate a 2-way phone call between the EM and the Minnesota Team Coordinator and explain the basis for the recommended protective action.

- If at Prairie Island
  Initiate a 3-way conference call between the EM, the Minnesota Team Coordinator and the Wisconsin State Radiological Coordinator and explain the basis for the recommended protective action.

5.2. Radiation Protection Support Supervisor

5.2.1 Obtain offsite dose projection data from the affected plant TSC.

5.2.2 Obtain and analyze the result of offsite monitoring efforts and compare these results with calculated dose projections.

5.2.3 Obtain information from the affected plant TSC regarding the magnitude and nature of potential radioactive releases and analyze the potential offsite consequences.

5.2.4 Provide the TSC with offsite survey results.

5.2.5 Provide the Emergency Manager with offsite dose and dose rate information and recommendations for offsite protective actions.

5.2.6 If it becomes necessary to issue a protective action recommendation to the state(s), prepare a Protective Action Recommendation Checklist, Figure 1 for Emergency Manager approval.

5.2.7 Prepare Emergency Notification Follow-up Message as found in Figure 2, of EPIP 1.1.5, "Start-up and Operation of EOF". Provide completed form to the Emergency Manager and transmit information to the State EOC.

5.2.8 If there has been a release to the environs, consider increasing the normal sampling frequency of the Radiological Environmental Monitoring Program (REMP) after all significant releases are terminated and the plant is in a stable condition.

5.2.9 Obtain and analyze the results of the Radiological Environmental Monitoring Program (REMP) as appropriate.

6.0 PROCEDURE

6.1 Analysis of Dose Projections for Actual Airborne Releases

6.1.1 Obtain the following information from the TSC.

6.1.1.1 Release rates and type of release (ground or elevated).

6.1.1.2 Meteorological data (wind speed, wind direction, and stability class).

6.1.1.3 Survey results from plant survey teams, as applicable.

6.1.1.4 Projected offsite dose calculations.

6.1.2 Record dose projections on area map referenced in EPIP 1.1.4 (use red marker).

6.1.2.1 This will normally be in the form of 16 sector dose data out to 10 miles.

6.1.2.2 Determine the highest integrated dose region and highest dose rate region.

6.1.3 Determine applicable radiation protection requirements for NSP personnel in affected offsite areas.

6.1.4 Dispatch survey teams to affected offsite regions with due regard to radiation protection requirements.

6.1.4.1 Teams should be deployed to populated areas where the highest dose rates are projected.

6.1.4.2 Direct the offsite monitoring to be performed in accordance with Corporate EPIP 1.1.10, "Offsite Surveys".

6.1.5 When survey data is available, plot the data on the area maps referenced in EPIP 1.1.4. Offsite survey results should be plotted (in blue marker) logging beta-gamma survey results in milliREM/hr followed by air sample results in uCi/cc.

6.1.6 Provide offsite monitoring results to the TSC for comparison with computer based estimates.

6.1.7 Perform a comparison of radiological data as follows:

6.1.7.1 Compare offsite monitoring results for consistency. Re-monitor areas of concern, as required.

6.1.7.2 Compare offsite monitoring results with dose calculation projections. Re-monitor areas of concern, as required.

6.1.7.3 Dose calculation techniques should represent an upper bound to potential offsite dose and dose rates. Field survey results more accurately indicate integrated dose and dose rate in the environs.

6.1.8 Contact the Radiological Emergency Coordinator for an update of offsite dose projections. Verify that offsite dose projections are consistent with offsite survey team results.

6.1.9 Determine any protective action recommendations that are prudent. These recommendations should be made and plotted on Figure 1 using the guidance provided in this procedure.

6.1.10 Provide the Emergency Manager with the current integrated dose and dose rate information data for populated areas and other areas of major concern. A summary report should be prepared at periodic intervals as time and information permit. The summary report should consist of the following:

6.1.10.1 Plot of integrated dose and dose rate information on area maps referenced in EPIP 1.1.4 (date, time, color code).

6.1.10.2 Summary of meteorological conditions, past changes in conditions and potential changes germaine to radioactive material transport.

6.1.10.3 Areas of highest integrated dose and dose rate.

6.1.10.4 Population areas of greatest concern.

6.1.10.5 Summary of monitoring and dose calculation efforts to date.

6.1.10.6 Planned monitoring and dose calculations in progress.

6.1.11 Complete the Emergency Notification Follow-up Message for reporting of the event. Use Figure 2, EPIP 1.1.5, "Start-up and Operation of EOF". Provide completed form to the Emergency Manager.

6.1.12 After the release has been terminated, consider retrieval of the "Emergency" TLDs (refer to EPIP 1.1.12 Implementation of

Radiological Environmental Monitoring Program).

6.2. Analysis of Dose Projection for Potential Airborne Releases

6.2.1 If the potential exists for a significant release of radioactive material from the plant, perform an analysis of potential offsite consequences as follows:

6.2.1.1 Request the TSC to determine the approximate releasable curie content of the containment.

6.2.1.2 Request the TSC to determine the most probable release path, i.e. ground release, stack release or building ventilation release.

6.2.1.3 Request the TSC to determine dose projection calculations based on release of this material under present and various meteorological conditions using the affected plant procedure for offsite dose calculations; Prairie Island Nuclear Generating Plant procedure F3-13, "Offsite Dose Calculations", or Monticello Nuclear Generating Plant procedure, A.2-406, "Offsite Dose Projection".

6.2.1.4 Using the data developed by the TSC assess the probability of a total rapid release vs a continuous slow release for an extended period of time. Perform dose calculations for most likely release mode and worse case mode.

6.2.1.5 Using the data developed by the TSC determine the population areas in risk.

6.2.2 Contact the Radiological Emergency Coordinator. Verify that the TSC calculations and assessment of offsite dose rates are in general agreement with those at the EOF. Any disagreements shall be brought to the attention of the Emergency Manager.

6.2.3 Determine any protective action recommendations that are prudent. These recommendations should be made, plotted on Figure 1, and forwarded to the Emergency Manager using the guidance in this procedure.

6.2.4 Provide the Emergency Manager with current assessment information. A summary report should be prepared at periodic intervals as other duties and information permit. The summary report should include the following:

6.2.4.1 Plot of most probable and worse case integrated dose on an area map.

6.2.4.2 Meteorological basis for the plot and potential for improvement or degradation of meteorological conditions.

6.2.4.3 Sectors of highest potential dose and population centers of concern.

6.2.4.4 Efforts underway to better determine the magnitude of the potential release.

6.2.5 Complete the Emergency Notification Follow-up Message using Figure 2, EPIP 1.1.5, "Start-up and Operation of EOF". Provide the completed form to the Emergency Manager.

6.3 Assessment of Liquid Releases

6.3.1 Obtain offsite monitoring data in accordance with Corporate EPIP 1.1.10, "Offsite Surveys".

6.3.2 Develop a followup report to the Emergency manager which includes the following:

6.3.2.1 Results of offsite monitoring.

6.3.2.2 Release status and potential for resumption or termination.

6.3.2.3 Dilution considerations and projected concentration of radioactive material at the nearest public water intake structure.

6.3.3 If the release is at Monticello, contact the TSC and obtain the expected arrival time of the radioactive material at the Minneapolis and St. Paul water intake structures.

6.3.4 If necessary, contact the state EOC and recommend that Minneapolis and St. Paul water intakes be closed. (Use Figure 1.)

6.4 Assessment for Re-Entry

6.4.1 Obtain offsite monitoring data in accordance with Corporate EPIP 1.1.10, Offsite Surveys

6.4.2 Prepare a report to the Emergency Manager which includes:

6.4.2.1 Summary of offsite monitoring results, including exposure rates, contamination levels, and isotopic information

6.4.2.2 Calculated values for the one-year integrated exposures, whole body and thyroid, which would be experienced by an individual allowed unrestricted re-entry to the affected area. (Use procedure in TAB B.)

7.0 GUIDANCE FOR RECOMMENDING PROTECTIVE ACTION

NOTE:

1. The values given in this section are conservative guidance for recommending protective action to the state(s). This guidance is to be used at the discretion of the Emergency Manager and is based upon the following:

   [1]The dose expressed is based on 1/4 of the EPA lower limit dose for evacuation.

   [2]The thyroid dose expressed is based on child thyroid dose.

   [3]The dose expressed is based on RG 8.13.

   [4]The dose expressed is based on the EPA lower limit dose for evacuation.

2. These recommendations are based on actual offsite doses or a high degree of confidence that these doses are actually expected offsite.

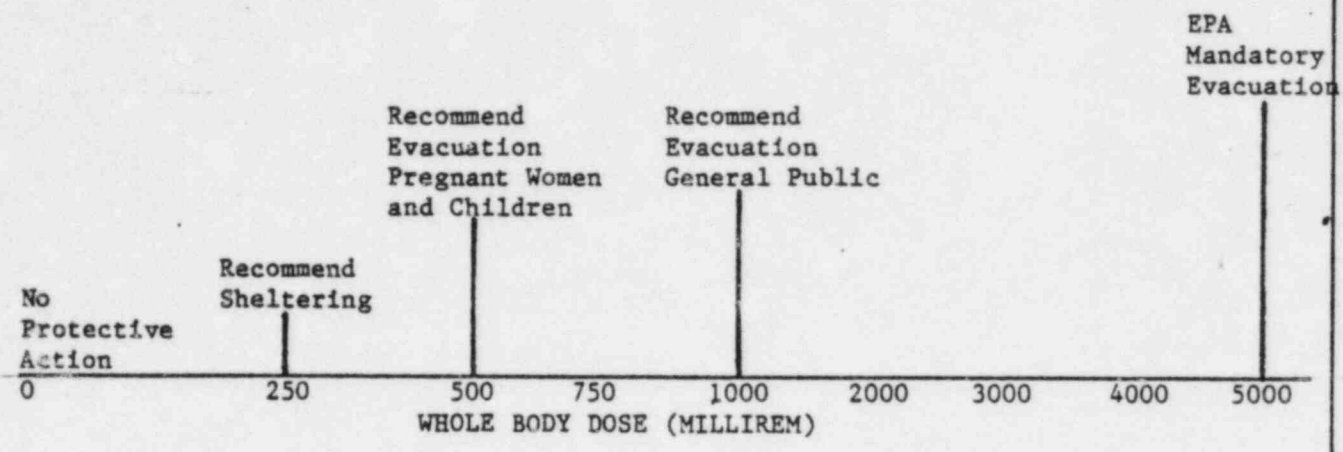
3. All protective action recommendations should be discussed with the State(s) Health Department.

4. The EPA Guidelines for Recommended Protective Actions located in TAB A shall serve as the maximum levels.

5. Further guidance may be found in Appendix C, Protective Action Guidance, NSP Corporate Nuclear Emergency Plan.

TABLE 1

NSP CONSERVATIVE GUIDANCE FOR
PROTECTIVE ACTION RECOMMENDATIONS
(see note in Section 7.0)



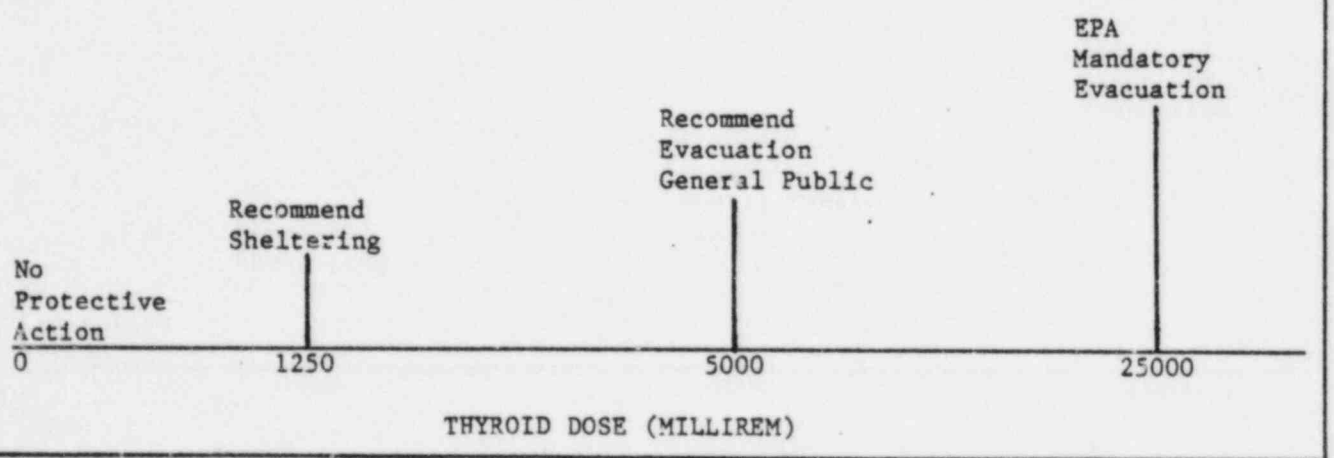
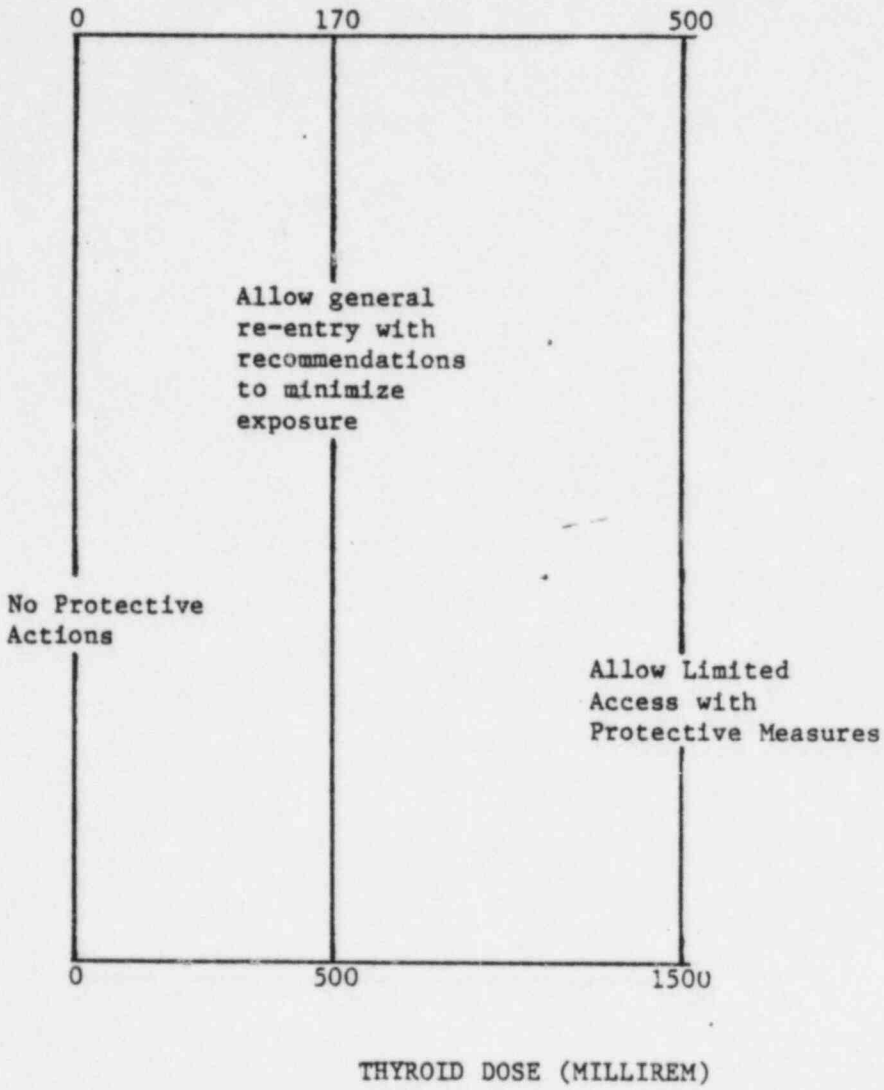


TABLE 2

NSP CONSERVATIVE GUIDANCE
FOR ALLOWING RE-ENTRY
(see Section 8.2)



7.1 No Protective Actions will be recommended up to 250 mRem whole body dose or 1250 mRem Thyroid dose [1,2] (see note)

7.2 Sheltering

7.2.1 Sheltering is a protective action which involves members of the general public taking cover in a building that can be made relatively air tight. Generally, any building suitable for winter habitation, with windows and doors closed and ventilation turned off, would provide reasonably good protection for about two hours; but would be ineffective after that period due to natural ventilation of the structure. Sheltering is an appropriate protective action for the following:

7.2.1.1 Severe incidents in which an evacuation cannot be implemented because of the rapid passage of the plume ("puff" release).

7.2.1.2 When an evacuation is indicated, but local constraints, such as inclement weather, road condition, etc., dictate that directing the public to seek shelter is a more feasible and effective protective measure than evacuation.

7.2.1.3 As a precautionary measure, while a determination of the need to evacuate is made.

7.2.2 Sheltering of the general public may be recommended at 250 mRem whole body dose or 1250 mRem thyroid dose [1,2] (see note)

7.3 Evacuation

7.3.1 Timely evacuation of members of the population is the most effective protective action. There are, however, disadvantages and constraints that may make evacuation inappropriate. Evacuation is an appropriate protective action for the following:

7.3.1.1 Situations where the lead time between declaration of the emergency and population relocation is compatible with plume movement.

7.3.1.2 Situations which do not provide for advance warning, but for which substantial reductions in population dose can be made by avoiding exposure to residual radioactivity (plume fallout) in wake of sudden severe incidents.

7.3.2 Evacuation of pregnant women and children may be recommended at 500 mRem whole body dose. [3] (see note)

7.3.3 Evacuation of the general public may be recommended at 1000 mRem whole body dose, or 5000 mRem thyroid dose. [4] (see note)

7.3.4 Evacuation Time Estimates are located in Appendix D to the Corporate Nuclear Emergency Plan.

7.4 Public Alert & Notification System (PANS)

NOTE: It is the responsibility of the state(s) to activate this system.

7.4.1 A Site Area Emergency and a protective action such as sheltering or evacuation has been recommended for the public within all, or a portion of, the 10 mile Emergency Planning Zone (EPZ) surrounding each plant.

7.4.2 A General Emergency classification has been declared at either the Monticello or Prairie Island Nuclear Generating Plant.

7.4.3 The Emergency Manager shall, if necessary, recommend to the Minnesota Division of Emergency Services (DES) and the Wisconsin Division of Emergency Government (WDEG) activation of the Public Alert and Notification System when a protective action guideline (PAG) is recommended.

7.4.4 The State(s) Duty Officer will be responsible for activating the Public Alert & Notification System which includes development of messages for the public.

7.4.5 If the State EOCs are not activated and the emergency requires immediate activation, make such a recommendation directly to the County Sheriffs.

Monticello Area
- Sherburne County
- Wright County

Prairie Island Area
- Goodhue County
- Dakota County
- Pierce County

7.4.6 The Public Alert & Notification System for alerting the public in the 10 mile Emergency Planning Zone (EPZ) surrounding each plant consists of the following:

- Fixed sirens for 100% coverage throughout the 5 mile zone and in population centers in the 5-10 mile zone.
- Emergency vehicles with sirens and public address in the 5-10 mile areas not covered by fixed sirens.
- National Oceanic and Atmospheric Administration (NOAA) activated tone alert radios in institutional, educational, and commercial facilities.

- The Emergency Broadcast System (EBS) which has access to television and radio stations within the area.

The primary means of alerting the public to an impending notification will be the use of fixed and mobile sirens. Once alerted, the public should turn to local commercial broadcast messages as the primary means of notification for conditions. Should there be more than one PAG during an incident and they are determined at different times, this procedure shall be repeated.

7.5 Close Minneapolis and St Paul Water Intakes (for Monticello liquid release).

7.5.1 This protective action should be recommended as determined necessary by Section 6.3 of this procedure.

8.0 Guidance for Recommending Contamination Control and Re-entry

8.1 Contamination Control (food, water, milk, etc.)

8.1.1 On a timely basis considering the needs of the emergency effort and the personnel resources available, the extent of radiological contamination within the 10 mile and 50 mile emergency planning zones should be assessed. This can be accomplished by implemementing the "Radiological Environmental Monitoring Program", EPIP 1.1.12 or by examination of environmental monitoring data from the state. This may not be part of the initial Protective Action effort.

8.1.2 As information becomes available, determinations concerning the need for offsite protective actions within the 50 mile EPZ should be made. These determinations should be made in accordance with the environmental guidance of the State Protective Action Guides provided in the Corporate Emergency Plan, Appendix C, and the State of Minnesota Radiological Emergency Response Plan.

8.1.3 Provide any recommendations for contamination control to the state(s).

8.2 Guidance for Recommending Re-entry

Following a general evacuation, re-entry may be recommended according to the following:

8.2.1 On an individual basis, persons with valid, urgent needs for access may be allowed to re-enter under the following conditions:

8.2.1.1 The expected whole body dose commitment does not exceed 500 mrem/yr;

8.2.1.2 The expected thyroid dose commitment does not exceed 1500 mrem/yr; and

8.2.1.3 Precautions are taken to minimize exposure.

8.2.2 The general population may be allowed to re-enter if the following applies:

8.2.2.1 The expected whole body dose commitment does not exceed 170 mrem/yr; and

8.2.2.2 The expected thyroid dose commitment does not exceed 500 mrem/yr.

TAB A

EPA GUIDELINES FOR RECOMMENDED PROTECTIVE ACTIONS
(WHOLE BODY AND THYROID DOSE FROM EXPOSURE TO A GASEOUS PLUME)

Projected Dose (Rem) to The Population	Recommendation Actions	Comments
Whole Body <1 Thyroid <5	No planned protective actions. 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 Thyroid 5 to <25	Seek shelter as a minimum. Consider evacuation. Evacuate unless constraints make it impractical. Monitor environmental radiation levels. Control access.	If constraints exist, special consideration should be given for evacuation of children and pregnant women.
Whole Body 5 and above Thyroid 25 and above	Conduct mandatory evacuation. Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access.	Seeking shelter would be an alternative if evacuation were not immediately possible.
Projected Dose (Rem) To Emergency Workers		
Whole Body 25 Thyroid 125	Control exposure of emergency team members to these levels except for lifesaving missions. (Appropriate controls include time limitations, respirators and thyroid prophylaxis.)	Although respirators and thyroid prophylaxis should be used where effective to control dose to emergency workers, Thyroid dose should not be the limiting factor for lifesaving missions.
Whole Body 75	Control exposure of emergency team members performing a life saving mission to this level. (Control of time exposure will be most effective.)	

TAB A

GUIDELINES FOR CONTAMINATION OF HUMAN FOOD AND ANIMAL FEED*

Preventive PAGs -

1.5 rem projected dose commitment to thyroid
0.5 rem projected dose commitment to whole body, bone marrow, or any other organ

Response Levels Preventive PAG

	I-131	Cs-134	Cs-137	Sr-90	Sr-89
Initial Activity Area Deposition (uCi/m^2)	0.13	2	3	0.5	8
Forage Concentration (uCi/kg) (Fresh Weight)	0.05	0.8	1.3	0.18	3
Peak Milk Activity (uCi/liter)	0.015	0.15	0.24	0.009	0.14
Total Intake (uCi)	0.09	4	7	0.2	2.6

Emergency PAGs -

15 rem projected dose commitment to the thyroid
5 rem projected dose commitment to the whole body, bone marrow, or any other organ

Response Levels for Emergency PAG

	I-131		Cs-134		Cs-137		Sr-90		Sr-89	
	Infant	Adult	Infant	Adult	Infant	Adult	Infant	Adult	Infant	Adult
Initial Activity Area Deposition (uCi/m^2)	1.3	18	20	40	30	50	5	20	80	1600
Forage Concentration (uCi/kg)	0.5	7	8	17	13	15	1.8	8	30	700
Peak Milk Activity (uCi/liter)	0.15	2	1.5	3	2.4	4	0.09	0.4	1.4	30
Total Intake (uCi)	0.9	10	40	70	70	80	2	7	26	400

*Reference: Accidental Radioactive Contamination of Human Food and Animal Feeds; Recommendations for State and Local Agencies, Federal Register, October 22, 1982.

TAB A
RECOMMENDED PROTECTIVE ACTIONS

ACCIDENT PHASE	EXPOSURE PATHWAY	EXAMPLES OF ACTIONS TO BE RECOMMENDED
EMERGENCY PHASE 1 (0.5 to 24 hours)*	Inhalation of gases, radio iodine, or particulate	Evacuation, shelter, access control, respiratory protection, prophylaxis (thyroid protection).
	Direct whole body exposure	Evacuation, shelter, access control
	Ingestion of milk	Take cows off pasture, prevent cows from drinking surface water, discard contaminated milk, or divert to stored products, such as cheese.
INTERMEDIATE PHASE 2	Ingestion of fruits and vegetables	Wash all produce, or impound produce, delay harvest until approve substitute uncontaminated produce.
	Ingestion of water	Cut off contaminated supplies, substitute from other sources, filter, demineralize.
(24 hours* to 30 days)	Whole body exposure and inhalation	Relocation, decontamination, access control.
LONG TERM PHASE 3	Ingestion of food and water contaminated from the soil either by resuspension or uptake through roots.	Decontamination, condemnation, or destruction of food; deep plowing, condemnation, or alternate use of land.
(Over 30 days)*	Whole body exposure from deposition material or inhalation of resuspended material.	Relocation, access control, decontamination, fixing of contamination, deep plowing.

1 Emergency Phase - Time period of major release and subsequent plume exposure.

2 Intermediate Phase - Time period of moderate continuous release with plume exposure and contamination of environment.

3 Long Term Phase - Recovery period.

* "Typical" Post-Accident time periods.

FORM 17-4911

TAB A

REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE

Structure or Location	Shielding Factor (a)	Representative Range
Outside	1.0	—
Vehicles 1.0		—
Wood-Frame House (b) (No Basement)	0.9	—
Basement of Wood House	0.6	0.1 to 0.7 (c)
Masonry House (No Basement)	0.6	0.4 to 0.7 (c)
Basement of Masonry House	0.4	0.1 to 0.5 (c)
Large Office or Industrial Building	0.2	0.1 to 0.3 (c, d)

(a) The ratio of the dose received inside the structure to the dose that would be received outside the structure.

(b) A wood frame house with brick or stone veneer is approximately equivalent to a masonry house for shielding purposes.

(c) This range is mainly due to different wall materials and different geometries.

(d) The shielding factor depends on where the personnel are located within the building (e.g., the basement or an inside room).

SELECTED SHIELDING FACTORS FOR AIRBORNE RADIONUCLIDES

Wood house, no basement	0.9
Wood house, basement	0.6
Brick house, no basement	0.6
Brick house, basement	0.4
Large Office or Industrial Building	0.2
Outside	1.0

*Taken from SAND 77-1725 (Unlimited Release)

TAB A

REPRESENTATIVE SHIELDING FACTORS FOR SURFACE DEPOSITED RADIONUCLIDES

STRUCTURE OR LOCATION	REPRESENTATIVE SHIELDING FACTOR[a]	REPRESENTATIVE RANGE
1 m above an infinite smooth surface	1.00	—
1 m above ordinary ground	0.70	0.47 - 0.85
1 m above center of 50-ft roadways, 50% decontaminated	0.55	0.4 - 0.6
Cars on 50-ft road;		
Road fully contaminated	0.5	0.4 - 0.7
Road 50% decontaminated	0.5	0.4 - 0.6
Road fully decontaminated	0.25	0.2 - 0.5
Trains	0.40	0.3 - 0.5
One and two-story wood-frame house (no basement)	0.4	0.2 - 0.5
One and two-story block and brick house (no basement)	0.2 [b]	0.04 - 0.40
House basement, one or two walls fully exposed:	0.1 [b]	0.03 - 0.15
One story, less than 2 ft of basement, walls exposed	0.5 [b]	0.03 - 0.07
Two stories, less than 2 ft of basement, walls exposed	0.03 [b]	0.02 - 0.05
Three- or four-story structures, 5000 to 10,000 ft^2 per floor;		
First and second floors:	0.05 [b]	0.01 - 0.08
Basement	0.01 [b]	0.001 - 0.07
Multi-story structures, 10,000 ft - per floor:		
Upper floors	0.01 [b]	0.001 - 0.02
Basement	0.005 [b]	0.001 - 0.015

(a) The ratio of dose received inside the structure to the dose that would be received outside the structure.

(b) Away from doors and windows.

* Taken from SAND 77-1725 (Unlimited Release)

FORM 17-4911

TAB B

DETERMINATION OF ONE-YEAR DOSE COMMITMENT
AS CRITERIA FOR RE-ENTRY TO EVACUATED AREAS

Inputs: - Ground deposition, Q, in uCi/m^2 of radionuclides whose composition has been determined by laboratory analyses or portable MCA.

- Exposure rate, R_o, 3' above contaminated ground determined by field measurements. Used to confirm calculated dose rates.

Assume: - Soil-to-air re-suspension factor of 10^{-6} uCi/m^3 per uCi/m^2 (units of m^{-1}) for inhalation pathway.

- Breathing rate of 0.91 m^3/hr.

Find: - Projected one-year dose to individuals re-entering evacuated area, sum of external and internal doses.

_____ External: $\sum_{i=1}^{i=n}$ $(D.F.)_i^*$ $mrem/hr/pCi/m^2 \times Q_i$ $uCi/m^2 \times 10^6$ $pCi/uCi \times 1.44\ T_i\ (1-e^{-\lambda_i t})$

* Dose factors can be obtained from Table E-6 of Reg. Guide 1.109.

_____ Inhalation: $\sum_{i=1}^{i=n}$ $0.91\ m^3/hr \times Q_i uCi/m^2 \times 10^6\ pCi/uCi \times 10^{-6}\ m^{-1} \times (D.F.)_i^{**}\ mrem/pCi \times 1.44\ T_i\ (1-e^{-\lambda_i t})$

** Dose factors for inhaled radionuclides can be obtained from Tables E-7 to E-10 of Reg. Guide 1.109. Use most restrictive D.F. listed (infant to adult).

i = identified isotope

t = integration period (use 1 year)

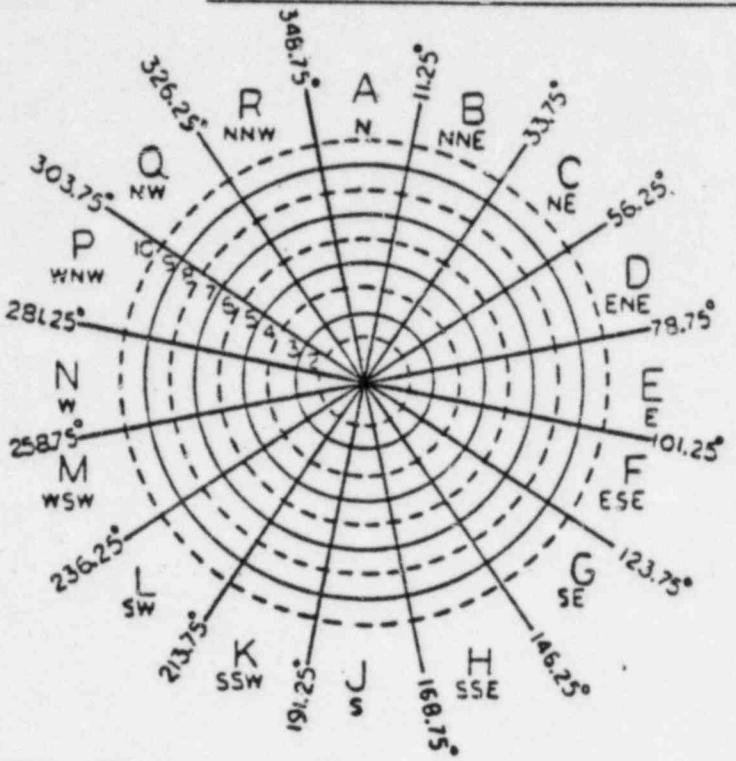
T_i = Effective environmental half-life of isotope i. Use radiological half-life, unless better information available.

Q_i = Ground concentration in uCi/m^2 of isotope i.

_____ Ingestion :(To be determined)

Note: For times when the ground is show-covered, assume ingestion pathway exposure to be negligible.

FIGURE 1
PROTECTIVE ACTION RECOMMENDATION CHECKLIST



NOTE:

- When this form is telecopied to the state, a call must be initiated by the EM to explain the basis for any recommendation.
- This form may be used in conjunction with an Emergency Notification Follow-up Message.
- Designate affected zones as follows: S for sheltering E for evacuation

Date _____
Time _____ Wind direction/speed _____° (From) At _____ (mph)

PROTECTIVE ACTION:

☐ SHELTER — Sector(s) _____ Mile(s)_____ Sector(s) _____ Mile(s)_____

☐ CONSIDER EVACUATION OF PREGNANT WOMEN AND CHILDREN

☐ EVACUATION — Sector(s) _____ Mile(s)_____ Sector(s) _____ Mile(s)_____

☐ ACTIVATE PUBLIC ALERT & NOTIFICATION SYSTEM

☐ CLOSE MINNEAPOLIS & ST PAUL WATER INTAKES (for Monticello liquid release)

☐ CONTAMINATION CONTROL (food, water, milk) — Sector(s) _____ Mile(s)_____ Sector(s) _____ Mile(s)_____

☐ CONSIDER TERMINATION OF PROTECTIVE ACTIONS IN PROGRESS

Justification for Protective Action Recommendations: _____

Prepared by: _____ Approved by: _____
Emergency Manager/Emergency Director

FORM 17-4911

NUCLEAR SUPPORT SERVICES DEPT NORTHERN STATES POWER COMPANY	CORPORATE NUCLEAR EMERGENCY PLAN IMPLEMENTING PROCEDURE NUMBER: EPIP 1.1.12 REV: 5
PREPARED BY: Gary Hudson Asst. Adm. Emergency Preparedness	EFFECTIVE DATE: FEBRUARY 17, 1983
REVIEWED BY: E R Ward Manager Nuclear Environmental Services	TITLE: 1.1.12 IMPLEMENTATION OF THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
APPROVED BY: General Manager Nuclear Plants	

1.0 PURPOSE AND OBJECTIVE

This procedure describes the Radiological Environmental Monitoring Program (REMP) and its interface with Emergency Plans and Implementing Procedures in the event of a nuclear plant emergency. It will also assist in the transition from an emergency condition to the post-accident recovery period.

2.0 CONDITIONS AND PREREQUISITES

2.1 All significant radioactive releases have been terminated.

2.2 Radioactive samples during an emergency condition are not included in the REMP.

2.3 An emergency condition existed which requires increasing the normal sampling frequency of the REMP.

3.0 ORGANIZATION AND RESPONSIBILITIES

3.1 Overall responsibility - Emergency Manager

3.2 In Charge - Radiation Protection Support Supervisor

3.3 Assistance - Administrator REMP

3.4 Sample Collection - ERAD Field Staff

4.0 DISCUSSION

4.1 The REMP is an established on-going program at the Monticello and Prairie Island Nuclear Generating Plants. The program is designed to monitor radioactivity in the environs of the plant. Estimates of radiation and radioactivity in the plant environs are then used as supporting

evidence for evaluating the performance of plant equipment and systems that control release of radioactive materials.

4.2 The REMP Program provides for various environmental samples at recognized intervals and locations. The following is a list of the samples and their normal sample frequency:

A.	Air Particulate and Radioiodine cartridges changed	- continuous sample/filters and - Weekly
B.	TLD	- Quarterly
C.	Milk (Cow)	- Monthly
D.	Well Water	- Quarterly
E.	Drinking Water	- Weekly
F.	Mississippi River Water	- Weekly
G.	Cultivated Crops	- Annually
H.	Fish and Invertebrates	- Semi-annual
I.	Bottom Sediment (River)	- Semi-annual
J.	Shoreline Sediment	- Semi-annual

4.3 There are 3 categories of TLDs at each plant. Each category contains numerous sets and they are identified as follows:

Category	Location
A	This ring surrounds the plant at the fence line
B	This ring surrounds the plant at 4.5 miles
S	Special areas (i.e. schools, etc)

Maps which identify the TLD and air monitoring station locations are available in each emergency response facility.

- Monticello E-EPD-4.4
- Prairie Island E-EPD-5.4

Two cards of 3 TLDs each are encased in plastic with proper identification and placed at each exposure location. One card is identified as "Regular" and the other is marked "Emergency". Under normal conditions the plastic case is changed on a quarterly basis and the laboratory has instructions to read only the "Regular" card. In case of an unscheduled gaseous release and the Emergency Director/Manager requests TLD pickup, the plastic case will be opened, the "Emergency" card removed and sent to the laboratory for reading.

4.4 Air Monitoring Stations

At locations around each plant there are air monitoring stations which operate continuously to collect particulates and radioiodine. The location of each station is marked on the TLD and Air Monitoring Station Map referenced in Section 4.3.

5.0 RESPONSIBILITIES

5.1 Emergency Manager

5.1.1 If necessary, the REMP personnel (ERAD Field Staff) may be activated for the following:

5.1.1.1 Service as sample couriers between the Radiological Field Survey Teams and the EOF Countroom. If sample couriers are not required they may also serve as drivers for the Radiological Field Survey Teams.

5.1.1.2 Collection of the Emergency TLDs after a release has been terminated.

5.1.1.3 Collection of filters and cartridges from air monitoring stations after a release has been terminated.

5.1.1.4 Increasing the normal sampling frequency of REMP after the release has been terminated.

5.1.2 If necessary, notify the Administrator -REMP that special environmental sampling is needed. If the Administrator - REMP cannot be reached, the EM will call the ERAD Supervisor - Ecological Studies or his designee at the affected plant.

5.1.3 Guidance for collection of TLDs which may be used at the discretion of the Emergency Manager.

5.1.3.1 For Alert and Site Area Emergency Conditions the "Emergency" set of TLDs can be collected for the affected sectors upon termination of the emergency condition.

5.1.3.2 For a General Emergency condition the "Emergency" set of TLDs may be exchanged during the emergency conditions, but they should not be exchanged during any known release period. Considerations for exchanging the dosimeters should include:

a) Taking parallel actions with the state and NRC as deemed necessary.

b) Providing interim data concerning the long term effects of the casualty on the environment.

c) Providing additional data concerning the extent of the release.

d) The "Regular" set of dosimeters should not be exchanged, except at the normal ninety-one day exchange date.

5.2 Administrator REMP

5.2.1 Contact Supervisor, Ecological Studies (ERAD), or one of his personnel, and request that they report to the Radiation Protection Support Supervisor (RPSS) at the EOF.

5.2.2 Contact the contract laboratory (Hazleton Environmental Services) and request that new sets of dosimeters be immediately forwarded to NSP.

5.2.3 Report to the EOF and supervise the activities related to the REMP while assisting the RPSS.

5.2.4 Specify the sampling procedures for collecting, identifying, and shipping environmental samples to the contract laboratory for analyses.

5.2.5 Inform the Emergency Manager of the results of the Radiological Environmental Monitoring Program.

5.3 Radiation Protection Support Supervisor (RPSS)

5.3.1 Assist the Emergency Manager in determining if it is necessary to activate the REMP personnel (refer to the EM responsibilities in this procedure).

5.3.2 If REMP personnel are activated ensure that they receive dosimetry and, if they are required to collect samples in a contaminated area, are accompanied by radiation protection personnel.

5.4 REMP Personnel (ERAD Field Teams)

5.4.1 If requested, report with an NSP vehicle to the RPSS at the EOF.

5.4.2 If the Administrator REMP has not been contacted, complete his duties.

5.4.3 If REMP samples are requested, follow standard REMP Procedures.

6.0 SAMPLING PROCEDURES

To assist in the decision-making process, informational sampling procedures are specified in tabs attached to this procedure. The following tabs are included:

Procedure	Tab
• Air Monitoring Locations	A
• TLDs	B
• Sample Courier Service between Radiological Field Teams and the EOF Countroom	C

TAB A

AIR MONITORING LOCATIONS

In order to determine the airborne radioactivity in the area around the plant-site, air monitoring equipment is located in the sectors most likely to yield high averages of ground contamination. The filters that collect particulates and the cartridges that collect radioiodine are changed periodically and are attached to continuously operating air pumping equipment. The facility is fenced and locked and a substation key is needed to gain entrance.

Monticello Air Station Locations

Station M-1 (Control)	11.1 mi @ 306°/NW
Station M-2	0.8 mi @ 23°/NNE
Station M-3	0.5 mi @ 181°/S
Station M-4	0.9 mi @ 150°/SSE
Station M-5	2.7 mi @ 136°/SE

Prairie Island Air Station Locations

Station P-1 (Control)	16.5 mi @ 348°/NNW
Station P-2	0.5 mi @ 294°/WNW
Station P-3	0.8 mi @ 313°/NW
Station P-4	0.4 mi @ 359°/N
Station P-5	1.6 mi @ 129°/SE

There is no Station P-5

Emergency Changing of Filters and Cartridges

To change the filters and cartridges, the following material is required:

1. Old substation key
2. A supply of metricel filters
3. A supply of charcoal cartridges
4. A supply of glassine envelopes

Procedure

1. Read and record the elapsed time on hour recorder - you need this number to determine exposure time.
2. Turn off power inside shelter and remove holders.
3. Remove the filter and place it in a glassine envelope. Remove the cartridge from its holder and label it.
4. Replace the filter and the cartridge and then turn the power back on.
5. Transport the filter and cartridge back to the EOF.

TAB B

TLDs

(Thermoluminescent Dosimeters)

General: Normally these dosimeters are placed inside an environmental case that has been bolted to a steel fence post. The locations are 4-5 miles away from the plant in 16 different meteorological sectors, at the site boundary in the 16 different meteorological sectors, at a control location, and at special interest areas.

Two cards of 3 TLDs each, are encased in plastic with proper identification and placed at each exposure location. One card will be identified as "Regular" and the other will be marked "Emergency". Under normal conditions the plastic case will be changed on a quarterly basis and the laboratory has instructions to ready only the "Regular" card. The "Emergency" card will be annealed only. In case of an unscheduled gaseous release and the Emergency Director/Manager requests TLD pickup, the plastic case will be opened the "Emergency" card removed and sent to the laboratory for reading.

Control Dosimeters: When the set of unexposed dosimeters is received from the laboratory, specially marked "control" badges are placed inside a lead-shielded case (control shield) located at the biological station and remains there until the other badges are removed to be returned to the laboratory. In case of an unscheduled release and the emergency badges are picked up, the "Emergency Control" must accompany them to the laboratory.

Recording Exposure Time: Be sure beginning and ending exposure time (date-hours) have been recorded on the shipping tag for each dosimeter.

Special Reporting: If special reporting of the results is required, the laboratory must be informed. Otherwise the results will be mailed to the Nuclear Support Services Department at a later date.

Replacement Badges: In case additional replacement badges are needed, they will be supplied by the contract laboratory by calling Hazleton, Mr Leo Huebner (312) 564-0700 Extension 224. Ask him to zero a set and ship them by "preferred air space" on the next commercial airline leaving O'Hare airport for Minneapolis. You must meet that plane and the package of badges will be delivered to the airline baggage office. Return of exposed badges can be accomplished by placing them in the carton the replacement badges arrived in, and reversing the above shipping procedure.

Be sure to remind persons involved in handling badges that they are "not" to be put through the airport x-ray machines. Better to open the package for visual inspection.

Tab B Con't

TLD LOCATIONS MONTICELLO NUCLEAR GENERATING PLANT
(Map E-EPD-4.4)

INNER RING (General Area of Site Boundary)

M01A - North Boundary Road - North Sector - Sampler is located on the south side of the road near pole #485. It is outside the fenced area of north sector air sampling station.

M02A - North Boundary Road - NNE Sector - Sampler is located on the south side of the road between poles #474 and #475. It is outside the fenced area of the NNE Sector air sampling station.

M03A - North Boundary Road - NE Sector - Sampler is located on the south side of the road between poles #455 & #456.

M04A - Road to Biology Station - East Sector - Sampler is located next to corner fence post around the first curve at the bottom of the road.

M05A - Road to Biology Station - ESE Sector - Sampler is located next to fence post opposite the road that leads to the meteorological tower.

M06A - Road to Biology Station - SE Sector - Sampler is located next to a fence post at the first curve in the road.

M07A - County Road 75 - SSE Sector - Sampler is located on the north side of the road adjacent to a sign that reads "Left Turn Traffic - 600 Feet".

M08A - County Road 75 - South Sector - Sampler is located on the north side of the road opposite the west side of the bridge over Hwy. 94.

M09A - County Road 75 - SSW Sector - Sampler is located on the east side of the fenced area of the air sampling station between County Road 75 and Highway 94.

M10A - County Road 75 - SW Sector - Sampler is located adjacent to the mail box of a trailer home north of County Road 75.

M11A - County Road 75 - WSW Sector - Sampler is located on the north side of the road opposite a "no passing zone" sign.

M12A - County Road 75 - West Sector - Sampler is located adjacent to a railroad communication pole and about 600 feet West of an unused service road entrance (Plant).

M13A - North Boundary Road - NW Sector - Sampler is located on the south side of the road between poles 497 and 498 near an existing fence post.

M14A - North Boundary Road - NNW Sector - Sampler is located on the south side of the road between poles 491 and 492

Tab B Con't

OUTER RING (4 to 5 miles distance)

M01B - Sherco #1 Air Monitoring Station - North Sector - Sampler is located on the south side of the monitoring building facing the Monticello Plant. (Sherburne County Road #4, east of the town of Becker about 1 mile).

M02B - County Road 11 and 55th Ave - NNE Sector - The sampler is located near the street signpost behind the telephone junction box, facing the plant.

M03B - Intersection of County Road 73 and 81 - NE Sector - The sampler is located behind the telephone junction box and faces the direction of the plant.

M04B - Sherco #6 Air Monitoring Station - ENE Sector - (On County Road #73) - Sampler is located south of the monitoring building adjacent to the power pole and facing the direction of the Monticello Plant.

M05B - City of Big Lake Garage - East Sector - County Road #73 and Highway 10 (NE corner) - Sampler is located on the southwest corner of the building about 6 feet away and facing the plant.

M06B - At junction of County Road #14 and 196th Street - ESE Sector Sampler is located on the northwest corner of the intersenction, midway between the street sign and a tree and facing the plant.

M07B - Industrial Drive - SE Sector - Sampler is located adjacent to NSP power pole #21 and facing the plant.

M08B - Dale K Larson Residence - SSE Sector - Highway #25 and approximately ½ mile south of County Road #106. - Sampler is located adjacent to the residence power pole and facing the plant.

M09B - Near Norbert Weinand Farm - South Sector - The sampler is located adjacent to power pole #44 and about 6 feet south of it facing the plant.

M10B - Near the John Reisewitz Farm - SSW Sector - The sampler is located near the road adjacent to pole #EM204, facing the Monticello Plant.

M11B - Near the Clifford Vanlith Farm - SW Sector - The sampler is located north of the road adjacent to the mail box and near pole #35.

M12B - Lake Maria State Park Entrance - WSW Sector - The sampler is located on the south side of the entrance road between a "state park" sign and a tree.

Tab B Con't

M13B - Near Bridgewater Switching Station - West Sector - (Enfield exchange) - Sampler is located outside the southeast corner of the fenced area and facing the Monticello Plant.

M14B - Near the Richard K Anderson Residence - WNW Sector - Sampler is located on the west side of the road adjacent to the mail boxes.

M15B - Near the Gary Williamson Residence - NW Sector - Sampler is located on the west side of the road adjacent to the mail boxes.

M16B - Sand Plain Research Farm (U of M) - NNW Sector - Sampler is located behind the signboard and facing the Monticello Plant.

SPECIAL INTEREST AREAS

M01S - Floyd Hartung Residence - SSW Sector - Sampler is located east of driveway next to a fence post.

M02S - Edgar Klucas Residence - SE Sector - Sampler is located adjacent to a pole with a night light on it - next to driveway.

M03S - Big Oaks Park - East Sector - (on County Road #11) - Sampler is located near the signpost on the north side of the entrance road and facing the plant.

M04S - Pinewood Elementary School - SSE Sector - Sampler is located adjacent to the northeast corner of the tennis court fence.

M05S - Roman Greener Residence - ESE Sector - (Near County Road #50 and 208th Street) - Sampler is located near the flag pole on the residence property.

M06S - Near Monticello Service Center - SE Sector - Sampler is located adjacent to the air monitoring station west of the building.

CONTROL (More than 10 miles away)

M01C - Kirchenbauer Farm - NW Sector - Sampler is located adjacent to the mail boxes.

Tab B Con't

(TLD LOCATIONS PRAIRIE ISLAND NUCLEAR PLANT)
(Map E-EPD-5.4)

INNER RING (General Area of Site Boundary)

P01A - Property Line - North Sector - Sampler is located on the inside of the fence adjacent to Corps of Engineers public access parking area and facing the plant.

P02A - Property Line - NNE Sector - Sampler is located at a corner of the property line fence near the biology station.

P03A - Property Line - South Sector - Sampler is located adjacent to south-east end of guard rail along the road near a power pole.

P04A - Property Line - SSW Sector - Sampler is located adjacent the north-west end of a guard rail along the roadway next to a small access road.

P05A - Property Line - SW Sector - Sampler is located inside the fenced area adjacent to a transmission tower.

P06A - Property Line - WSW Sector - Sampler is located just inside the fenced area adjacent to a telephone junction box and south of an underground cable warning sign.

P07A - Property Line - West Sector - Sampler is located just inside the fenced area about 75 feet north of the railroad entrance gate adjacent to a fence sign.

P08A - Property Line - WNW Sector - Sampler is located adjacent to the last power pole that serves the meteorological station, along the property fence line.

P09A - Property Line - NW Sector - Sampler is located at the northwest corner of the property fenced area, just inside the fence and facing the plant.

P10A - Property Line - NNW Sector - Sampler is located on the inside of the fence, west of the north entrance gate facing the plant. (Adjacent to a transmission tower.)

Tab B Con't.

OUTER RING (4-5 miles distance)

P01B - Thomas Killian Residence - North Sector - Sampler is located adjacent to a power pole north of the driveway.

P02B - Roy Kinneman Farm - NNE Sector - Sampler is located south of the driveway adjacent to a telephone junction box.

P03B - Wayne Anderson Farm - Northeast Sector - Sampler is located in the front yard adjacent to a power pole facing toward the plant.

P04B - Nelson Drive (Road) - ENE Sector - Sampler is located adjacent a power pole and a telephone junction box about 15 feet south of the road.

P05B - County Road E near Goodwin Coulee Road - East Sector - Sampler is located north of County Road E and about 300 feet northwest of the Goodwin Coulee Road (Near a power pole that has a "Danger High Voltage" sign on it and about 25 feet northwest of the Richard Enberg mailbox.

P06B - William Hauschildt Residence - ESE Sector - Sampler is located between a power pole and a telephone junction box on the east side of the driveway.

P07B - Red Wing Service Center - SE Sector (North of Highway 61 on Tyler Road) - Sampler is located adjacent to a corner transmission pole and the railroad right-of-way close to a chain link fence.

P08B - David Wnuk Residence - SSE Sector - Sampler is located on the west edge of property adjacent to a telephone control pole and a road sign "Do not Pass".

P09B - Highway 19, South of 61 - South Sector - Sampler is located adjacent a pole supporting a telephone junction box. Pole is located opposite a new bridge on the east side of Highway 19.

P10B - Cannondale Farm - (Leeson Lane - James Bryon) SSW Sector - Sampler is located adjacent to a corner fence post and near a "Speed Limit 30" road sign.

P11B - Wallace Weberg Farm - SW Sector (This farm is located on top of the bluffs) - Sampler is located adjacent to a power pole and the telephone junction box facing the plant. (East of Driveway).

P12B - Ray Gerken, Jr Farm - WSW Sector - Sampler is located north of driveway in the farmyard on the east end of a storage shed facing the plant.

Tab B Con't.

OUTER RING (4-5 miles distance)

P13B - Thomas O'Rourke Farm - West Sector - Sampler is located adjacent to a power pole and a telephone junction box outside a stock fence area.

P14B - David J Anderson Farm - NW Sector - Sampler is located near the front yard south of a red cedar tree. (This sampler is not located near the main road for protection.

P15B - Holst Farms - NNW Sector - Sampler is located east of the residence near a corner post of a fenced area.

SPECIAL INTEREST AREAS

P01S - Federal Lock & Dam #3 - SE Sector - Sampler is located north of the fenced air sampling station (#4) and facing the plant.

P02S - Charles Suter Residence - SSE Sector - Sampler is located on the north side of a power pole in the farmyard and facing the plant.

P03S - Carl Gustafson Farm - South Sector - Sampler is located near the north side of the road on the last curve before the farmyard. (Close to a corner power pole and a fence post) (keep sampler away from field gate).

P04S - Near Richard Burt Residence - SSW Sector - Sampler is located next to a tree about 15 feet away from the curve in the road.

P05S - Kenney Store - Trailer Park - West Sector - Sampler is located at the north end of a redwood fence and adjacent to a telephone junction box.

P06S - Earl Flynn Farm - WNW Sector - Sampler is located on the east side of the house adjacent to a large stump and facing the plant.

CONTROL (More than 10 miles away)

P01C - Robert Kinneman Farm - NNW Sector - The sampler is located about 250 feet east of the residence adjacent to a corner fence post and facing the plant.

TAB C

SAMPLE COURIER SERVICE BETWEEN THE RADIOLOGICAL FIELD TEAMS AND THE EOF COUNT ROOM

General

Serve as drivers for the Radiological Field Teams or transport samples between the Radiological Field Teams and the Count Room located in the EOF. Persons assigned this duty would be ERAD field personnel knowledgeable with the area of the plant.

Reporting

Notification by the Emergency Manager will activate two persons from the ERAD field personnel to report to the EOF. They will report to the Radiation Protection Support Supervisor (RPSS) for personnel badges, portable radios, and assignment.

NUCLEAR SUPPORT SERVICES DEPT NORTHERN STATES POWER COMPANY	CORPORATE NUCLEAR EMERGENCY PLAN IMPLEMENTING PROCEDURE NUMBER: EPIP 1.1.14 REV: 5
PREPARED BY: Gary Hudson Asst. Adm. Emergency Preparedness	EFFECTIVE DATE: JARY 17, 1983
REVIEWED BY: E C Ward Manager Nuclear Environmental Services	TITLE: NDOR AND CONSULTANT SERVICES
APPROVED BY: General Manager Nuclear Plants	

1.0 PURPOSE AND OBJECTIVE

This procedure specifies the responsibilities of the individuals who are to obtain vendor or consultant services. The primary vendor and service organizations, which may in the event of an emergency provide assistance, are listed in Tabs to this procedure.

2.0 CONDITIONS AND PREREQUISITES

An Emergency condition has been declared at either the Monticello or Prairie Island Nuclear Generating Plant, the EOF has been activated, and there is a need for vendor or consultant services.

3.0 ORGANIZATION AND RESPONSIBILITIES

3.1 Overall Responsibility - Emergency Manager

3.2 In Charge - Emergency Manager

3.3 Assistance - Logistics Coordinator

4.0 RESPONSIBILITIES

4.1 EMERGENCY MANAGER

4.1.1 If the NSSS vendor has not already been notified by the plant, direct the Logistics Coordinator to notify the NSSS vendor of the emergency condition.

4.1.2 If site assistance is required, direct the Logistics Coordinator to request that the NSSS vendor send a site response team to the applicable EOF.

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4.1.3 Determine the need for assistance from additional vendors, consultants or contractors and direct the Logistics Coordinator to procure the necessary services.

4.2 LOGISTICS COORDINATOR

4.2.1 Assist the Emergency Manager in obtaining vendor or consultant services.

4.2.2 Notify the applicable NSSS vendor and architect engineer of the emergency condition. Notification procedures are provided in Tabs attached to this procedure.

4.2.3 If necessary, identify equipment or assistance that is desired from the vendor.

4.2.4 If instructed by the Emergency Manager, request that the vendor site response team proceed to the EOF.

4.2.5 If vendor assistance will be required for more than three days, initiate procedures to procure long-term services in accordance with EPIP 1.1.9 "Emergency Processing of Purchase Orders".

4.2.6 Maintain all logistics information concerning requests for services or purchases on a "Logistics Information Sheet", Figure 2, TAB B, EPIP 1.1.4 "Emergency Organization Records & Forms". Instructions for completion of the form are also included in TAB B of that procedure.

5.0 Vendor and Consultant Services

5.1 Vendors or consultants which can provide assistance are listed in TABS attached to this procedure:

	TAB
• Monticello	A
• Prairie Island	B
• General (available for response to either site)	C

5.2 Telephone numbers for these organizations are located in the Nuclear Emergency Preparedness Telephone Directory.

TAB A

MONTICELLO
Vendor and Consultant Services

- Telephone Numbers for these organizations are located in the Nuclear Emergency Preparedness Telephone Directory.
- To inform the primary vendor and architect engineer of an emergency condition, or to request emergency assistance, the Logistics Coordinator should contact the organization and describe plant conditions.
- The vendor will control the contacting of applicable organizations within their own company to supply whatever assistance is required.

1. NSSS - General Electric Corporation

   NOTE: General Electric's number is that of an answering service assigned to monitor calls for emergency purposes. The NSP representative contacting this number shall request that the on-call Product Service Manager be notified of the call and provide the answering service with a call-back number. The applicable product service manager will then return the call to determine NSP need.

2. AE - Bechtel Power Corporation

3. Radio Repair - Granite City Electronics

TAB B

PRAIRIE ISLAND
Vendor and Consultant Services

- Telephone Numbers for these organizations are located in the Nuclear Emergency Preparedness Telephone Directory.
- To inform the primary vendor and architect engineer of an emergency condition, or to request emergency assistance, the Logistics Coordinator should contact the organization and describe plant conditions.
- The vendor will control the contacting of applicable organizations within his own company to supply whatever assistance is required.

1. NSSS - Westinghouse Electric Corporation

   Please inform one Westinghouse contact to ensure early notification to W of an emergency occurring at your plant. Please be prepared to discuss as many facts as are available at the time of the call and identify a cognizant individual in your organization to provide continuing communications and updates to W.

2. AE - Fluor Power Services

3. Radio Repair - Folsom Electronics

TAB C

GENERAL (available for either site)
Vendor and Consultant Services

Telephone Numbers for these organizations are located in the Nuclear Emergency Preparedness Telephone Directory.

1. INPO Emergency Response Center:

   INPO has access to many supplier and contracting firm emergency contact telephone numbers and they can provide additional technical assistance as requested.

2. Helicopter Service

   In case of an accident and you need immediate transportation, the following helicopter service is committed to respond:

   Imperial International Inc.
   (Fleming Field)
   South St Paul, MN

   This organization flies only Bell Jet Rangers that carry 5 passengers.

3. Emergency Radiological Laboratory Facilities

   The following companies have personnel and laboratory facilities available for emergency response.

Laboratory	Address	Contact	Remarks
• Hazleton Environmental Sciences	1500 Frontage Rd Northbrook, IL 60062	Leo Huebner	*can send 4 persons
• NUS Corporation Radiological Labs	5350 Campbells Run Road Pittsburgh, PA 15205	Charles J Marcinkiewicz	*can send 6 persons
• Science Applications Inc (Nuclear Environmental Services)	3 Choke Cherry Rd Rockville, MD 20850	Greg Duggan	*can send 4 persons
• Radiation Management Corporation	3508 Market Street P O Box 7940 Philadelphia, PA 19101	C E McGee	*can send 5 persons

*24 HOUR LAB AVAILABLE