INTERNAL CORRESPONDENCE

DATE 5-2-83

FROM M. A. DAVIS

LOCATION Monticello

TO Special Distribution of Emergency Procedures

LOCATION VARIOUS

SUBJECT Revised Procedures for Emergency Procedures Book

Revisions to the Emergency Procedures were reviewed in a recent Operations Committee Meeting. Listed below are the procedures superseded and revised. Other pages not revised may have been reprinted with the revised pages to facilitate updating the Book.

Superseded Pages

Procedure A.2-410, Page 1 through 18, Rev 1

Revised Pages

Procedure A.2-410, Page 1 through 21, Rev 2

Prepared By M. A. Davis

Reviewed By C. Mathiam

Op. Comm. Final Review Mtg.# 199 Date 4-28-83

Approved By [signature] Date 5-9-83

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

OUT-OF-PLANT SURVEYS

Procedure A.2-410

REVIEW AND APPROVAL

Prepared by: Carlyon A. Diaz ALARA Review: Ed Mathiesen Date 4/19/83
Reviewed by: Ed Mathiesen Q.A. Review: Rev 0 Date 1-25-82
Operations Committee Final Review: Meeting Number 1199 Date 4-28-83
Approved by: J. D. Dey Date 5-9-83
Op. Com. Results Review: Not Required Mtg. # 1056 Date ___

PURPOSE

The purpose of this procedure is to specify the method of staffing the survey teams, the monitoring equipment and supplies, and the methods to be employed by the survey teams and the Radiological Emergency Coordinator to monitor and record field survey data.

CONDITIONS AND PREREQUISITES

A. An airborne or liquid release of radioactive material has occurred, is occurring, or may occur.

B. A survey of the site has been requested or is required.

C. A survey of off-site areas has been requested or required and the EOF is not staffed sufficiently to do the survey.

ORGANIZATION AND RESPONSIBILITIES

A. Overall Responsibility - Emergency Director

B. In Charge - Radiological Emergency Coordinator (REC)

C. Assistance - Monitoring Section Leader (MSL)

DISCUSSION

A. Off-site surveys during an emergency are normally performed by sister plant radiation protection technicians when the corporate organization is fully activated. Prior to this, off-site surveys must be done by the affected plant's radiation protection personnel. Surveys of on-site out-of-plant areas are always assigned to the affected plant staff.

B. During the initial stage of an emergency, the number of personnel available for survey work may be small. The Radiological Emergency Coordinator will make decisions on employment of personnel resources for maximum effect. When the Radiation Protection Support Supervisor (RPSS) position is activiated, all field survey teams will be transferred to the control of the RPSS.

WP/kk

C. This procedure is essentially identical to the corporate procedure for off-si surveys (EPIP 1.1.10), which sister plant personnel will use when the EOF is activated. The reason for this is to minimize the impact of switching from the plant procedure to the corporate procedure when the EOF and Radiation Protection Support Supervisor position is activated.

D. 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. Unless circumstances dictate otherwise, the EOF Countroom will be employed for all samples taken pursuant to this procedure.

RESPONSIBILITIES

A. Radiological Emergency Coordinator or Monitoring Section Leader

1. 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 projections results. Determine the necessary radiation protection for survey teams.

2. 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 TSC 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. When additional information concerning the type of release is available, the type of monitoring may be modified as circumstances dictate.

3. 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.

4. Upon termination of the emergency condition, direct the survey teams to return all equipment to normal locations. Direct that a complete inventory be conducted to return all equipment inventories to normal levels. Direct that the EOF count room equipment be shutdown and the count room returned to a standby status.

B. Survey Team Members

1. Obtain appropriate monitoring equipment from the survey team kits at the Assembly Points (one kit at each location) or the EOF (three kits). Obtain and re-zero dosimeters.

2. Perform operability checks on monitoring and sampling equipment before going into field:

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

3. Obtain a portable radio from the EOF or R.P. Office and operationally check the radio before starting the survey. Keep the radio operational at all times while performing surveys in order to maintain communications with the TSC.

   a. Since radio communications can be intercepted by commercially available scanners, all communications must be brief and factual and free of exclamatory or alarming expressions. All radio communications will utilize the DVP unless directed otherwise.

   b. Carefully word data transmissions to minimize possible confusion. In particular, avoid abbreviations such as "mREM" which could be confused with "REM". Use the complete word or unit ("milliREM").

   c. Use the phonetic alphabet (see attachment 6) when communicating sample point identification numbers.

   d. Use a mag-mount external antenna for field communications.

4. If so directed by REC or MSL, use protective clothing and equipment contained in the survey kit.

5. Conduct a search for the plume when departing the plant.

6. Observe the respiratory protection and the field dose rate precautions, as stated in Attachment 7 at all times while conducting a plume search, taking dose rate measurements or taking air samples.

7. At points where the plume is encountered, or at each designated survey point perform surveys in accordance with applicable procedures as directed by the Radiological Emergency Coordinator or Monitoring Section Leader.

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.

9. The survey team should accurately document all survey data on a Emergency Sample Results Log, (see example in Attachment 1). Enter the date, time, name of surveyor, and instrument serial number, and model for each survey entry.

10. Frequently check personal dosimeters and request relief if cumulative exposure approaches administrative control levels. Survey team members can contact the R.P. Coordinator to determine current exposure status. Plant survey team members are also responsible for ensuring that non-plant drivers have dosimetry and that exposure control procedures are followed.

PROCEDURE

A. Precautions

1. If an instrument malfunctions or "pegs" out during survey operations immediately exit the area by the same route used to enter it, and obtain a new instrument if necessary. A malfunctioning instrument should be appropriately tagged.

2. Take care not to contaminate or damage survey instruments. Particular care should be exercised to avoid damage to the beta window of a beta-gamma instrument.

3. Exposures of personnel in the survey party shall be in accordance with Monticello Nuclear Generating Plant administrative control levels. Monitoring teams must remain alert to their own exposure and request relief if their cumulative exposure approach these levels. The Emergency Director may authorize exposure limit extensions, if necessary (A.2-401). All exposures shall be maintained as low as reasonably achievable.

4. If the Radiological Emergency Coordinator so directs, or if substantial airborne activity or contamination is suspected, don protective clothing and/or respirators, as appropriate. Avoid the unnecessary use of respirators and protective clothing. If observed dose rates exceed 100 millirem per hour while monitoring out of doors, evacuate the area and/or seek shelter, unless otherwise directed by Radiological Emergency Coordinator.

B. Equipping of Off-Site Survey Teams

1. Obtain an NSP vehicle, if available. There are normally two station wagons available for off-site surveys. The keys are under control of the R.P. Coordinator. Otherwise, use any available privately-own vehicle. Record starting mileage and gas tank level. There should be at least 1/2 tank of gas. Obtain another vehicle if necessary and practicable.

C. Equipment Operation

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

a) Calibrated within specified interval
b) Response checked satisfactorily
c) Meter zeroed

2. 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:

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

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

c) 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.

d) 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.

e) 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).

D. Types of Samples

1. At each sample point the following samples may be made:

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

2. Special samples to be taken as directed by Radiological Emergency Coordinator:

a) Liquid Samples

NOTE: Re-entry phase monitoring and sampling will be as directed by the RPSS and is covered by corporate procedure.

E. Sampling Procedures

1. Plume Search Technique

a) Equipment Required

1) Radiation Survey Instrument (RO-2, or equivalent, with Beta Correction Factor)
2) Sample Logs (Form 5790-410-1)
3) Pen and/or pencil

b) Procedure

1) When departing for the field:

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) Periodically hold the instrument out the vehicle window, while in transit, and watch the instrument for a meter defection.

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 on sample log

d. Close the probe window

e. Record the "window closed" reading on sample log

f. Determine the corrected beta reading

4) Record the readings and calculate the beta and gamma dose on sample log.

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 REC or MSL 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.

2. Air Sample

a) Equipment Required

1) Battery powered or generator powered air sampler
2) Fiberglass Particulate Filter
3) Silver Zeolite Cartridge
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 (Form 5790-410-1)
11) Stainless Steel Gas Chamber

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. Record the flow rate through the sampler.

NOTE: If precipitation is occurring, draw sample from covered area. Umbrella may be used for this purpose.

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. Analyse in accordance with Step 6, below, then 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
d) Exposure rate of sample

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

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

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

WP/kk

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:

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

NOTE 1: Where μCi's on absorber = activity on absorber determined from Attachment 2 using the corrected count rate.

NOTE 2: If background exceeds 1000 CPM, notify the REC or MSL 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.

NOTE: If precipitation is occurring, draw sample from covered area. Umbrella may be used for this purpose.

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) Use the curve in Attachment 4 to determine the concentration, µCi/cc, of Xe^{133} equivalent.

d) Recording

1) Record the air sample results on the Emergency Sample Results Log, and report the results to the REC or MSL using the portable radio.

2) As directed, save the sample for future analysis. The central collection point for off-site samples is the EOF. On-site samples may be analyzed at the plant. All samples should have exposure rate marked on the label.

3. Stationary Survey

a) Equipment Required

1) Radiation Survey Instrument (RO-2 or equivalent, with Beta Correction Factor)
2) Sample Results Log (Form 5790-410-1)
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 on the Sample Results Log.

d) Close the probe window.

e) Record the "window closed" reading on the Sample Results Log.

f) Determine the corrected beta reading.

3) Report the results to the REC or MSL as follows:

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

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, seal and label bag.

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 Attachment 3.

c) Determine the gross activity using the graph shown in Attachment 3.

d) Save the sample for further analysis.

e) Reports results to the REC or MSL at the TSC by portable radio.

f) Record the results on the Emergency Sample Results Log.

5) The central collection point for off-site samples is the EOF. On-site samples may be analyzed at the plant.

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 off-site survey teams will relieve the plant team taking continuous samples at the Monticello Bridge. Required sample frequency will be specified by the Radiological Emergency Coordinator.

2) Additional liquid surveys may be requested by the State or the Emergency Director. 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 and St. Paul drinking water intakes

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:

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

NOTE: (1) Contamination levels greater than 100,000 dpm/100 cm^2 requires respiratory protection.

(2) .10 is smear efficiency.

f) Log smear results, including date and time on an Emergency Sample Results Log (Attachment 1), and report results to the REC.

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 1 cm).

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:

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

Attachment 1

Example of
EMERGENCY SAMPLE RESULTS LOG

Form 5790-410-1
Rev. 0, 2/20/82
Page 1 of 2

EMERGENCY SAMPLE RESULTS LOG

DATE _____

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

1. Formulas listed on back
2. Remarks:

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

_____
TECHNICIAN SIGNATURE

WP/kk

Form 5790-410-1
Rev. 0, 02/20/82
Page 2 of 2

Attachment 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. $\mu Ci/cc$ (particulate) = $\frac{(CPM\ (net))\ (4.5E\text{-}7\ \mu Ci/dpm)}{(\text{instrument efficiency})(\text{sx time} \times \text{cfm} \times 2.83 \times 10^4)(CF)}$
   (See Note 2 and 4)

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

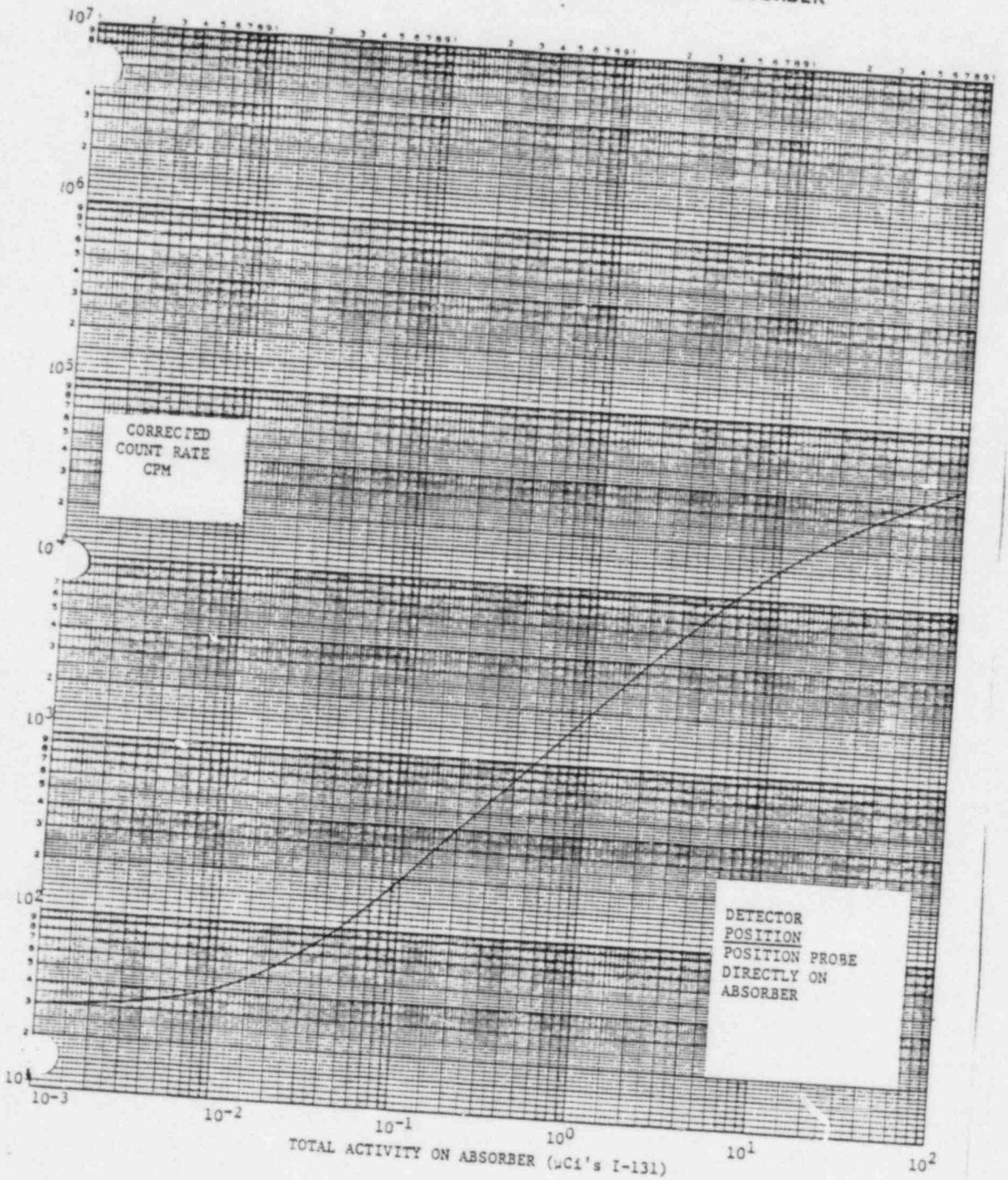
NOTES:

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 paper filter size counted with a 2 inch GM pancake probe.

WP/kk

Attachment 2

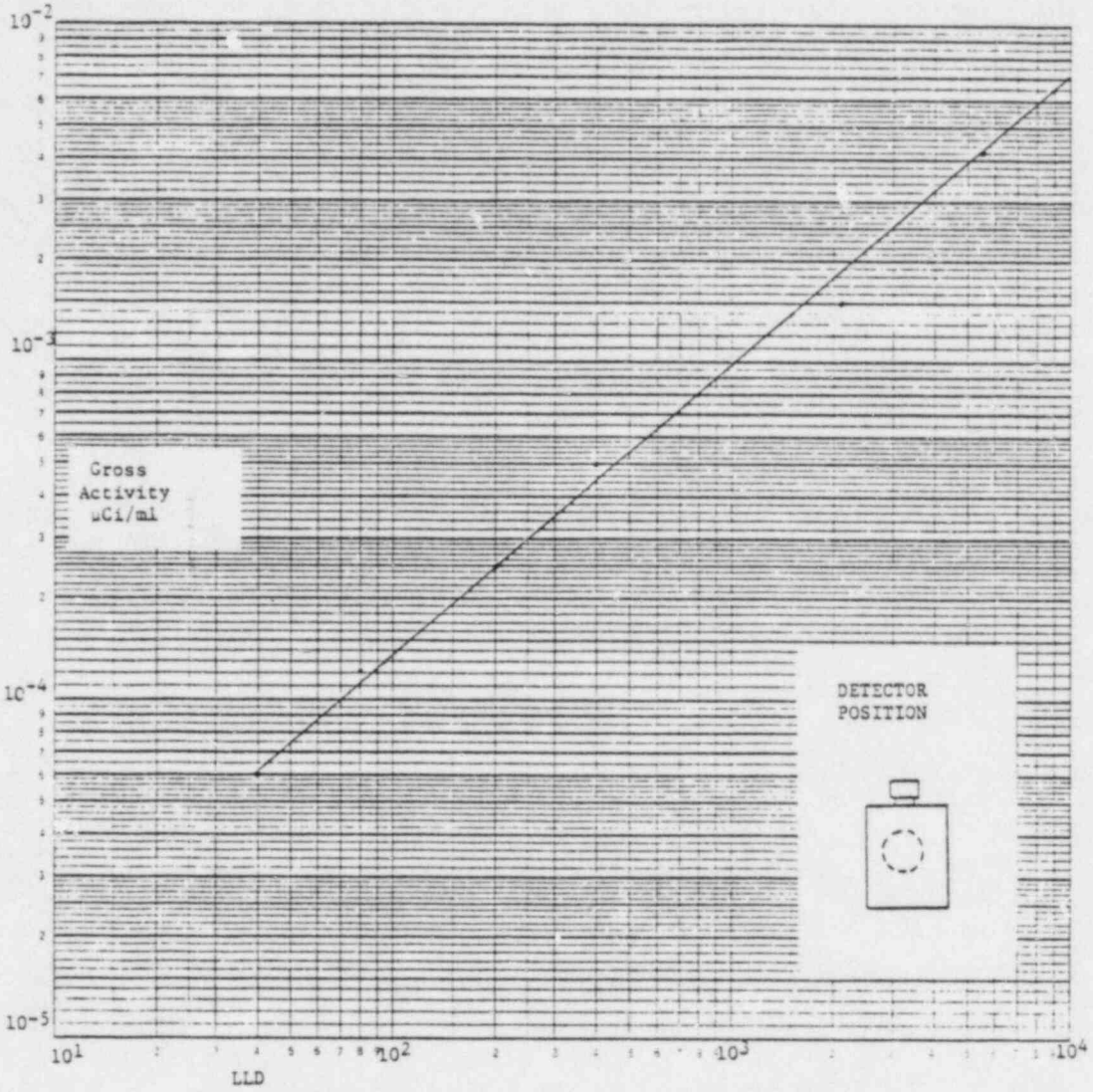
GROSS IODINE CURVE USING RM-14 WITH 2" GM
PANCAKE PROBE WITH SILVER ZEOLITE ABSORBER



WP/kk

Attachment 3

GROSS LIQUID ACTIVITY CURVE
USING RM-14 WITH HP-210 PROBE

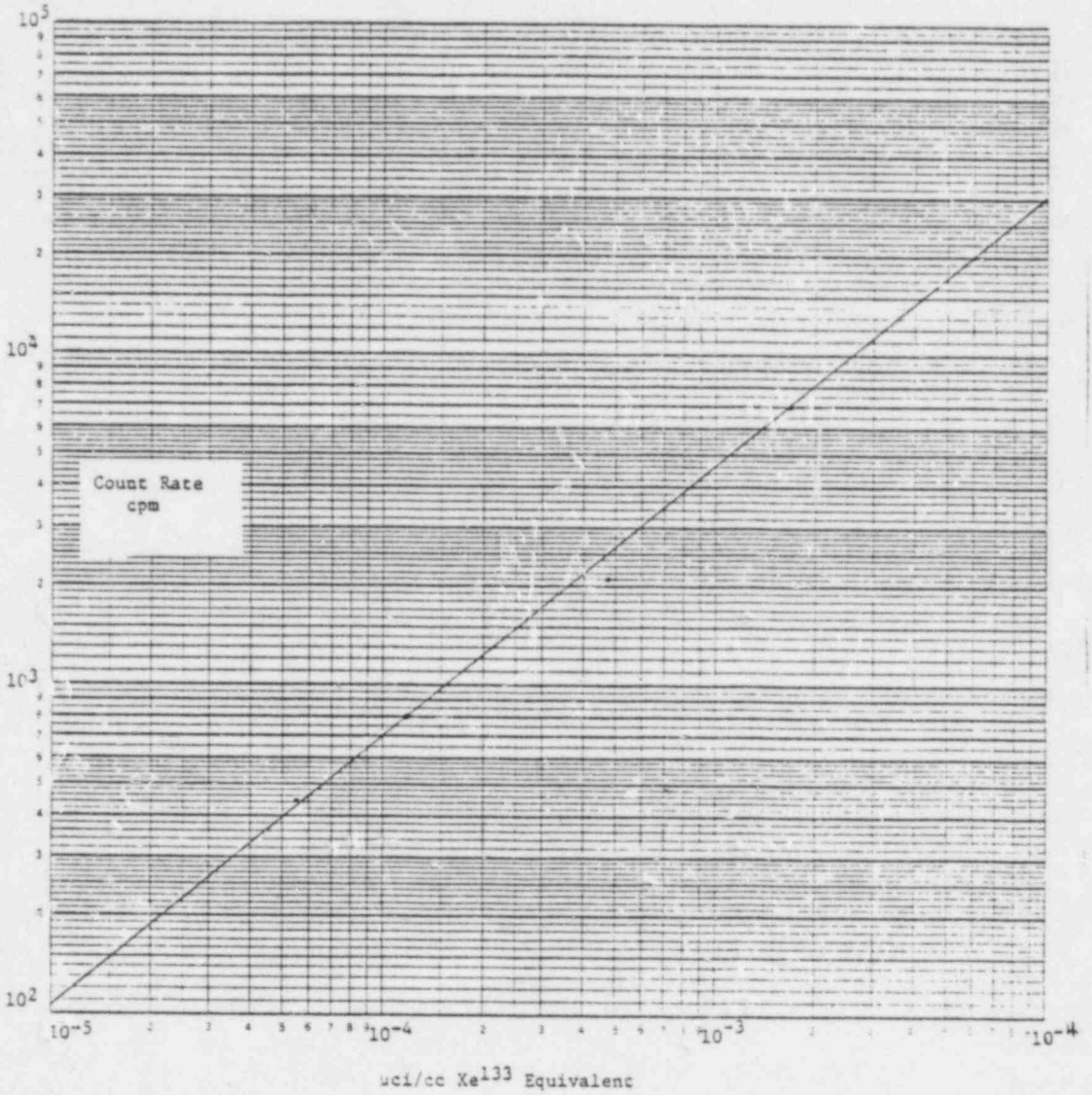


WP/kk

Attachment 4

GAS CHAMBER CALIBRATION CURVE

(100 cc S.S.)



WP/kk

Attachment 5

SURVEY TEAM EQUIPMENT PACKAGE

1. Each 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
2	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 (Approximately 100)
1 (Box)	Garbage Bags (Approximately 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 Chamber)
1	Suction Bulb (Gas Chamber)
1 (Package)	Filter Paper (Gas Chamber)
10	One Liter Poly Bottles
1	Box Air Sampler Filter Papers
1 (Package)	Survey Sample Labels (Approximately 30)
* 1	Portable Radio with magnetic base 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	Watch or Clock
1	Calculator
30	Smears (cloth and paper)
1	Snow Scoop
1	Procedures Binder (See #2 next page)
1	Weighted Poly Bottle Holder
1	Canvas Bag containing protective clothing for two people (respirators, coveralls, gloves, hoods, footcovers, foul weather (rain) Gear, Umbrella, etc.)

* Not stored in footlocker

WP/kk

Attachment 5 (Cont'd.)

SURVEY TEAM EQUIPMENT PACKAGE

2. The Emergency Plan Drawings Binder shall contain:

1	Prairie Island Radiological Sampling Point Map (E-EPD-5.1) and related list of location descriptions.
1	Monticello Radiological Sampling Point Map (E-EPD-4.1) and related list of location descriptions.
1	Copy of EPIP 1.1.10, "Off-Site Surveys"
10	Emergency Sample Results Form EPIP 1.1.10, Figure 1
1	Copy of EPIP 1.1.8, "Communcations Equipment and Information"
1	Copy of Procedure A.2-410, 'Out-of-Plant Surveys'
1	Road Map of State of Minnesota
1	Road Map of State of Wisconsin

WP/kk

Attachment 6

PHONETIC ALPHABET

Letter	Word	Letter	Word
A	Alpha	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliet	W	Whiskey
K	Kilo	X	Xray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

WP/kk

ATTTACHMENT 7

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 µCi/cc; or

(b) The REC/MSL 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 100 mR/hr.

(2) Survey Teams should not proceed to areas greater than 1 R/hr unless directed by the Radiological Emergency Coordinator or Monitoring Section leader.

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

WP/kk

Internal Correspondence

NSP

Date May 2, 1983

From D. L. Orrock Location Monticello

To Special Distribution of Emergency Procedures Location Various

Subject Revised Procedures for Emergency Procedures Book

Revisions to the Emergency Procedures were reviewed in a recent Operations Committee Meeting. Listed below are the procedures superseded and revised. Other pages not revised may have been reprinted with the revised pages to facilitate updating the Book.

Superseded Pages

List of Current Procedures (2/18/83)
Procedure A.2-301, Pages 1 through 10, Revision 1
Procedure A.2-503 - DELETED 4/28/83
Procedure A.2-302, Pages 1 through 8, Revision 2
Procedure A.2-303, Pages 1 through 3, Revision 2
Procedure A.2-411, Pages 1 through 4, Revision 0
Procedure A.2-106, Pages 1 through 4, Revision 3
Procedure A.2-201, Pages 1 through , Revision 2
Procedure A.2-205, Pages 1 through , Revision 1
Procedure A.2-403, Pages 1 through 9, Revision 2

Revised Pages

List of Current Procedures (5/2/83)
Procedure A.2-301, Pages 1 through 10, Revision 2
Procedure A.2-302, Pages 1 through 7, Revision 3
Procedure A.2-303, Pages 1 through 3, Revision 3
Procedure A.2-411, Pages 1 through 4, Revision 1
Procedure A.2-106, Pages 1 through 4, Revision 4
Procedure A.2-201, Pages 1 through 9, Revision 3
Procedure A.2-205, Pages 1 through 8, Revision 2
Procedure A.2-403, Pages 1 through 9, Revision 3

Prepared by: D L Orrock

Reviewed by: C D Mathias

Op. Com. Final Review: Meeting # 1199 Date 4-28-83

Approved by: T L Ferry Date 5-3-83

FORM 17 3497

INTERNAL CORRESPONDENCE

DATE 4-6-83

FROM

LOCATION MMBP

TO Special Distribution of Emergency Procedures

LOCATION

SUBJECT Revised Procedures for Emergency Procedures Book

Revisions to the Emergency Procedures were reviewed in a recent Operations Committee Meeting. Listed below are the procedures superseded and revised. Other pages not revised may have been reprinted with the revised pages to facilitate updating the Book.

Superseded Pages

List of current pages
A-2-406 pages 1-17

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Prepared By _____

Reviewed By _____

Op. Comm. Final Review Mtg. # 1198 Date 21 APR 83

Approved By _____ Date 4-29-83

INTERNAL CORRESPONDENCE
FORM 1PSM7

DATE 4/26/83

FROM K. F. Jepsen LOCATION Monti

TO Special Distribution of Emergency Procedures LOCATION Various

SUBJECT Revised Procedures for Emergency Procedures Book

Revisions to the Emergency Procedures were reviewed in a recent Operations Committee Meeting. Listed below are the procedures superseded and revised. Other pages not revised may have been reprinted with the revised pages to facilitate updating the Book.

Superseded Pages

Containment Gas Sample Obtained at Post Accident Sampling System
Procedure A.2-415, Rev. 1, pg 1-6

Containment Iodine and Particulate Samples Obtained at Post Accident Sampling System
Procedure A.2-416, Rev. 1, pgs 1-8

Revised Pages

Containment Gas Sample Obtained at Post Accident Sampling System
Procedure A.2-415, Rev 2, pgs 1-7

Containment Iodine and Particulate Samples Obtained at Post Accident Sampling System
Procedure A.2-416, Rev. 2, pgs 1-9

Prepared By K R Jepsen

Reviewed By T A Shiver

Op. Comm. Final Review Mtg.# 1198 Date 4/21/83

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A.2 EMERGENCY PLAN IMPLEMENTING PROCEDURES
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A.2 EMERGENCY PLAN IMPLEMENTING PROCEDURES
LIST OF CURRENT PAGES

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes ___ No X

ACTIVATION OF THE TECHNICAL SUPPORT CENTER (TSC)

A.2-106

Prepared by: [signature] ALARA Review: Revision 0 Date 3/27/81
Reviewed by: [signature] Q.A. Review: Revision 0 Date 3/28/81
Operations Committee Final Review: Meeting Number 1199 Date 4/28/83
Approved by: [signature] Date 5-3-83
Op. Com. Results Review: Not Required Mtg. # 948 Date 3/25/81

PURPOSE

This procedure provides specific information and instructions for the organization, activation and operation of the Technical Support Center (TSC) in support of the Monticello Nuclear Generating Plant and NSP Emergency Plans.

CONDITIONS AND PREREQUISITES

An emergency condition corresponding to an Alert or a higher emergency classification has been declared at the Monticello Nuclear Generating Plant as provided in the MNGP Emergency Plan.

PRECAUTIONS

The TSC facilities may be used for normal daily operations as well as for training and emergency drills provided that these activities do not interfere with the immediate activation of the TSC or the continuing TSC operations in the event of an accident. TSC facility use during normal operation shall be limited to activities that will not degrade the level of TSC preparedness to react to accident situations and will not reduce TSC systems reliability.

ORGANIZATION AND RESPONSIBILITIES

A. Emergency Director - Overall In-Charge

B. TSC Coordinator - Responsible for logistics and administrative aspects of TSC activation and operation.

C. TSC Staff - Assist TSC Coordinator, as requested, with operational aspects of TSC.

DISCUSSION

A. TSC Function

TSC personnel will provide guidance to the Control Room operating personnel in the management of abnormal conditions and in accident mitigation. During

recovery operations, the TSC shall provide plant systems support for the management personnel who will be located in the Emergency Operations Facility (EOF). The TSC will function as the primary information source to the EOF ar to the NRC for plant operations. The TSC shall perform the functions of the EOF until the EOF is staffed.

B. Location

The TSC is located on the second floor of the Administration Building.

C. Data and Information Resources

The TSC area contains the following:

1. A complete set of up-to-date as-built drawings of plant structures and systems. (Normally located in the Library on 3rd floor of Administration Building.

2. The current Plant Technical Specifications.

3. Plant Operating Procedures

4. Safety Analysis Report (USAR)

5. Complete set of essential technical manuals

6. Emergency Plan Implementing Procedures

D. Communications

The TSC contains the following:

1. NRC Operations - Hotline Telephone (ENS)
2. NRC Health Physics - Dedicated Telephone (HPN)
3. EOF to TSC - Hotline Telephones (2)
4. Control Room - Intercom
5. Access Control - Intercom
6. State EOC to TSC - Hotline Telephone
7. State DES Radio Hotline
8. Commercial Telephones (4)
9. Plant Extensions (17)
10. Telecopier
11. Control room to TSC Party Line

E. Equipment and Facilities

The TSC contains the following:

1. Two Process Computer CRT's (Control Room Repeaters)

WP/kk

E. Equipment and Facilities (Cont'd.)

2. CRT for Control Room CCTV
3. Off-Site Dose Projection Computer Terminal
4. Apple Computer, CRT & Printer
5. Instrument Cabinet (4 Strip Chart Recorders)
6. Emergency Lighting
7. Status Boards
8. Wall Maps
9. Procedure form racks
10. Portable CAM
11. Area Radiation Monitor

F. Supplies

1. Paper and pens
2. Self-Reading Dosimeters and charger
3. Telephone headsets
4. Mega-phone
5. Thyro-bloc tablets
6. Log books
7. Chart paper
8. MET printer paper
9. Telecopier paper

PROCEDURE

PART I - ACTIVATION

STEP 1 Activate computer CRT's (push in button on upper right hand corner of CRT's).

STEP 2 Activate CRT for the Control Room CCTV (switch on CRT and camera control). Check with the Control Room to verify that the camera is turned on.

STEP 3 Check the TSC instrument cabinet. This cabinet contains an ARM which is normally on. The four (4) charts are scram activated but can be turned on by momentarily turning the power switch to test. Activate the charts if not already activated and mark the chart with date, time and initials.

STEP 4 Check the intercoms to Access Control and Control Room.

NOTE: If the OSC intercom does not work, check switch on bottom of unit.

STEP 5 If habitability is of concern, request radiological survey of the TSC. The REC will be responsible for ensuring routine surveys of the TSC and for evaluation of the results. Prior to the REC's arrival, a survey may be requested of any available Radiation Protection personnel.

STEP 6 Activate the CAM used to monitor the air in the TSC. (The CAM is located on a cart in the TSC.) Move the cart to the hallway south of the TSC and activate the system by plugging the electrical cord into a wall outlet. Mark the chart with date, time and initials.

STEP 7 Clear the TSC of interferring equipment, personnel or furniture.

STEP 8 Move the aperture card file and Minolta RP407 card reader from the library on 3rd floor down to the TSC.

PART II - OPERATION

NOTE: The following is a list of procedural steps for which the TSC Coordinator is responsible. Each step which contains the word 'continually' means that the step should be repeated regularly as needed while the TSC is in operation.

STEP 1 Continually maintain the Emergency Organization and EOF Status boards. This will require an exchange of information with the other emergency centers. The desired result of the exchanges is that all response centers have up-to-date status boards. If one or more of the TSC staff positions is not filled, determine from the Emergency Director whether further efforts should be made to fill the position(s).

STEP 2 If the emergency condition is expected to extend beyond the time when TSC personnel should be relieved, assist the Emergency Director with setting up a shift coverage schedule. Continually ensure 24-hour coverage for TSC duties.

STEP 3 Continually ensure logistical support for TSC personnel, e.g. stationary supplies, food and beverages (especially coffee).

STEP 4 Continually ensure that the TSC is kept clear of unassigned and unnecessary personnel who may interfere with TSC operation. The Security Group Leader may be requested to assist in this function.

STEP 5 If the personnel accountability procedure is implemented, assist the Security Group Leader with accounting for TSC personnel.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operations Manual

3. NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

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Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

ON-SITE MONITORING AND PROTECTIVE ACTION CRITERIA

Procedure A.2-201

Prepared by: [signature] ALARA Review: [signature] Date 4/19/83
Reviewed by: [signature] Q.A. Review: Revision 0 Date 3/28/81
Operations Committee Final Review: Meeting Number 1179 Date 4-25-83
Approved by: [signature] Date 5-3-83
Op. Com. Results Review: Not Required Mtg. # 948 Date 3/25/81

PURPOSE

The purpose of this procedure is to (1) provide coordination and direction for on-site radiological monitoring efforts during an emergency and (2) to provide criteria for on-site protective action implementation.

This procedure is not intended to supersede procedures A.2-104 (Site Area Emergency) or A.2-105 (General Emergency) which direct specific levels of evacuation. These evacuations should be implemented per the applicable procedure. However, if the criteria contained in this procedure is more limiting (i.e., calls for an earlier or higher level of evacuation) than procedures A.2-104 or A.2-105, then this procedure shall take precedence.

CONDITIONS AND PREREQUISITES

A. A declared emergency condition at the Alert level or higher exists, or

B. The Emergency Director or Radiological Emergency Coordinator, has requested a survey of areas within the site boundary (including in-plant areas).

PRECAUTIONS

A. Monitoring teams should be reminded to remain alert to their own exposure and request relief if their cumulative exposure approaches a MNGP administrative control level. The Emergency Director may authorize exposure limit extensions, if necessary.

B. Communications with the monitoring team will normally be via operations portable radios. Since radio communications at this frequency can be intercepted by commercially available scanners, ensure that all communications related to reporting survey data are brief, factual and free of exclamatory or alarming expressions. The DVP mode will be used unless directed otherwise.

C. Ensure that instructions and data transmissions are carefully worded and clearly understood.

   1. Avoid abbreviations (such as "mrem" which could be confused with "rem"). Use the complete word or unit, i.e., "millirem".

2. Clearly identify survey locations, using predesignated survey location numbers, map coordinates, and equipment/building names, as available.

D. Prior to recommending an evacuation of site personnel to the Emergency Director, the Radiological Emergency Coordinator should determine, based on the best information available, that evacuation is the protective action that will result in the lowest personnel exposure. In making an evacuation recommendation, the Radiological Emergency Coordinator should consider (1) dose rates at Assembly Points, on-site and along evacuation routes; and (2) whether or not these conditions can be mitigated prior to personnel receiving significant exposures.

E. Evacuations should be accomplished either before or after the passage of the release, and evacuation routes should be chosen that lead personnel away from the path of the plume.

ORGANIZATION AND RESPONSIBILITIES

Emergency Director (ED) - Overall responsibility

Radiological Emergency Coordinator (REC) and/or Monitoring Section Leader (MSL) - Direct on-site survey effort, review results, and implement or recommend onsite protective actions.

Radiation Protection Specialist - Perform surveys, collect and analyze samples and report results.

Radiation Protection Coordinator - Assist REC/MSL with coordination of survey teams.

DISCUSSION

A. The extent and degree of on-site radiological monitoring following a release of radioactive material will depend on the nature, the severity, the physical/chemical form and the radioisotopic composition of the release. The Emergency Director, Radiological Emergency Coordinator or MSL will determine the extent and nature of post-accident radiological monitoring.

B. For releases which occur during normal working hours, sufficient Radiation Protection personnel will be available to support several monitoring teams. During other times, it may only be possible to deploy one monitoring team. In these circumstances, the ED, REC or MSL will assign priorities for radiological monitoring based on the known or expected extent and severity of the release and/or related radiological conditions, while calling in additional personnel.

C. In the event of a radioactivity release determined or estimated to be equivalent to or greater than the levels contained in Guideline No. 1, "Radioactive Effluents" for a ALERT in Procedure A.2-101, "Classification of Emergencies", a monitoring team should be dispatched to perform a beta-gamma dose rate survey on-site. The purpose of this survey is to confirm that a release is (has) taken place, and to assess the need for

protective actions. The starting point of this survey should be consistent with the expected source and magnitude of the release and extend out to the site perimeter in the sector with the highest projected dose rate. This survey should be limited to specific survey points rather than a "scan" survey in order to obtain initial data rapidly. Following this, time and personnel permitting, more extensive scan surveys may be performed, if warranted. Based on the survey results at this point, the monitoring team should proceed along the site perimeter for a sufficient distance, in either direction, to ensure that the maximum levels have been identified. This survey should be performed periodically if the release continues and if personnel are available.

D. Silver zeolite cartridges will be used for all air samples. All sample media obtained by the monitoring teams will be retained for possible further analysis.

NOTE: Silver Zeolite (and charcoal cartridges if desired) may be reused during off-site monitoring in a particular emergency, as long as the cartridges exhibit count rates less than background, and are undamaged. In particular, silver zeolite cartridges used for low-level environmental monitoring (negligible count rate) could be advantageously used within the plant in areas having high noble gas activity as well as high radioiodine concentrations. The Radiological Emergency Coordinator or MSL will direct the reuse of sample cartridges if warranted.

E. The habitability or conditions in the following areas should be assessed as specified.

1. If a Local Evacuation has been initiated, based on area radiation monitors or continuous air monitors, an appropriate survey should be performed to verify the alarm condition, and to attempt to determine the reason for the increase from normal levels.

2. If a Plant Evacuation is declared, a survey should be performed in the primary assembly areas to assess the habitability of the assembly area, in addition to the survey described in Paragraph C above.

3. The Control Room and TSC ARM readings should be monitored, and an air sample for particulate and iodine radioactivity should be obtained, if the monitor indicates the need, or if airborne activity is suspected.

4. If high airborne levels ($> 10^{-2}$ µCi/cc) are known or expected to exist in the Reactor Building, dose rate surveys should be performed in areas which can receive "shine" radiation from the 1027-1074 level of secondary containment.

5. Dose rate surveys should be performed in the proximity of the stack if high release rates (> 10 Ci/sec) are occurring.

6. If significant fuel damage is known or expected to have occurred (> 100 R/hr on the containment monitor or > 100 µCi/cc in the reactor coolant), surveys should be performed around the perimeter of the plant structure, especially near the Reactor Bldg. railroad doors.

7. The habitability of the location of the security guard at the access road barricade should be assessed, and of any personnel who may be in the Guard House.

8. Assess contamination levels of any food, water, or eating/food preparation surfaces in the plant, guard house, or any other eating area within an evacuated area, i.a.w. procedure A.2-402.

9. The habitability of the OSC, TSC and Access Control Areas should be assessed.

PROCEDURE

STEP 1: Use available information (meteorological information, effluent monitors, radiation monitors, etc.) to define sector(s) or area(s) to be monitored. Continually review Attachment 1 to ensure the proper areas are being surveyed as necessary.

STEP 2: Assemble monitoring team(s). Ensure that at least one member of each team is qualified to perform emergency surveys per Procedure A.2-403 or A.2-410, whichever is applicable.

STEP 3: Brief monitoring team(s) on sector(s) or area(s) to be monitored; radiological conditions and other potential hazards that may be encountered; precautions to be observed; and protective clothing or equipment as necessary.

NOTE: If necessary, ensure that Emergency RWP checklists and/or Emergency Exposure Authorizations are initiated.

STEP 4: Dispatch monitoring team(s). Maintain frequent radio contact and track progress of team(s) on a map or plan view as appropriate.

STEP 5: Record monitoring data as it is received over the radio (Form No. 5790-202-1 may be used for this purpose). Direct backup readings or samples be taken if appropriate. Remind team members to monitor their own exposures.

STEP 6: If initial results indicate that more complete data is needed, or that adjacent areas should be surveyed, direct monitoring team(s) to perform additional monitoring at specified locations.

STEP 7: Determine the need for contamination control measures and implement Procedure A.2-402 if necessary.

STEP 8: Upon completion of monitoring recall monitoring team(s). Instruct team leader to report to the TSC for debriefing if necessary.

STEP 9: Evaluate monitoring data. Compare results to criteria in Attachment 2, On-Site Protective Action Criteria, and implement or recommend protective actions as appropriate to protect on-site personnel. If you are recommending an evacuation, initiate Form No. 5790-201-1, Evacuation Criteria Checklist (Attachment 3), and forward to the Emergency Director.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operations Manual

ATTACHMENTS

1. On-Site Monitoring Checklist

2. On-Site Protective Action Criteria

3. Example of Evacuation Criteria Checklist

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Page 1 of 1

ATTACHMENT 1

ON-SITE MONITORING CHECKLIST

1. Assess habitability in the following areas, as appropriate.

   a. Control Room/TSC*/OSC

   b. Access Control (including SAS)*

   c. Guard House*

   d. Assembly Point

   e. Security guard at access road barricade*

   f. Other site locations in which it is known or suspected people may be present, such as the cold shop, office trailers, EPA field station, Big Oaks Park. The Owner Controlled Area Log should be utilized to verify all appropriate locations are checked.

   * Issue TLD's/SRD's to personnel in these areas if dose rate is > 1 mR/hr or at REC/MSL discretion.

   NOTE: The REC/MSL must ensure that, when dosimetry is issued, the information is recorded and dosimetry is collected, as appropriate.

2. Assess radiological conditions in following special areas, as appropriate.

   a. site areas which can be affected by 1027-1074 airborne shine

   b. stack area if high release rate

   c. plant structure perimeter

   d. food, water or eating/food preparation surfaces

   e. Local evacuation areas

   f. Protected area perimeter

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ATTACHMENT 2

Page 1 of 2

On-Site Protective Action Criteria

Whole Body Exposure Rates (mrem/hr)

Criteria	Action
Significant increase (2 x normal) in the plant has occurred or is imminent.	Evacuate the affected buidling(s)
> 1 in Clean Area	Evacuate occupied areas not part of emergency response
> 10	Consider evacaution of women who still may be present.
> 100	Evaluate personnel doses. Execute A.2-401 for those personnel approaching administrative limits and deemed by the Emergency Director as vital to the emergency response effort. Evacuate all others.
> 1000	Consider evacuation of all affected areas except the Control Room.

Smearable Surface Contamination Levels (dpm/100 cm^2)

Criteria	Action
Significant increase in the plant has occurred or is imminent.	Evacuate affected areas or building(s).
> 100 in Clean Area	Evacuate occupied areas within the Clean Area not part of emergency response effort; control eating, drinking and smoking in other occupied areas.
> 500	Consider protective clothing use
> 5000	Ensure protective clothing use

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ATTACHMENT 2

Page 2 of 2

Airborne Radioactivity Levels (MPC)

Criteria	Action
> 0.1	Evacuate occupied areas not part of emergency response effort.
> 0.25	Evaluate personnel MPC-hrs Limit exposures to < 40 MPC-hrs/week if possible. Use respirators whenever practical.
> 1	Evacuate all personnel not deemed by the Emergency Director as vital to the emergency response effort. Consider use of KI i.a.w. A.2-304.

WP/kk

ATTACHMENT 3

Form 5790-201-1
Revision 1, 02/26/82
Page 1 of 1

Example of
EVACUATION CRITERIA CHECKLIST

1. Condition(s) considered as possible reasons for evacuation:

_____

_____

_____ _____ _____
REC Initials Time Date

2. Area(s) affected: _____

_____

_____ _____ _____
REC Initials Time Date

3. Precautions Section of Procedure A.2-201 given full consideration.

_____ _____ _____
REC Initials Time Date

4. Type of evacuation recommended (if applicable) _____

_____ If Local Evacuation, area(s) evacuation is recommended for:

_____

_____ _____ _____ _____
REC Initials Time Date

5. _____ Evacuation (implemented/not implemented)

_____ _____ _____
Emergency Director Time Date

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

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Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes ___ No X

PERSONNEL ACCOUNTABILITY

A.2-205

Prepared by: D. S. Orrock ALARA Review: Revision 0 Date 3/27/81
Reviewed by: C. O. Mathison Q.A. Review: Revision 0 Date 3/28/81
Operations Committee Final Review: Meeting Number 1199 Date 4/28/83
Approved by: J. L. Fay Date 5-3-83
Op. Com. Results Review: Not Required Mtg. # 948 Date 3/25/81

PURPOSE

The purpose of this procedure is to provide instructions for accounting for personnel in the event of an evacuation. This procedure applies specifically to the three levels of evacuation described in procedure A.2-301, Emergency Evacuation.

CONDITIONS AND PREREQUISITES

A. An emergency condition has occurred at Monticello Nuclear Generating Plant resulting in radiological and/or other hazardous conditions and making personnel evacuation to unaffected areas necessary.

B. Procedure A.2-104 (Site Area Emergency), A.2-105 (General Emergency), or A.2-301 (Emergency Evacuation) has been implemented.

ORGANIZATION AND RESPONSIBILITIES

Emergency Director - Overall in-charge; responsible for ensuring completion of this procedure whenever implemented.

Security Group Leader - Responsible for conduct of this procedure when implemented for plant or site evacuation.

Assembly Point Coordinator -
TSC Coordinator -
OSC Coordinator -
Site Superintendent -
R.P. Coordinator - Each responsible for accountability of personnel reporting to respective response centers.

CAS Operator - Responsible for security computer operations as directed by Security Group Leader.

DISCUSSION

A. In the case of a plant evacuation, the accounting process should be completed within 30 minutes. The purpose of a speedy accounting is to allow for a timely search for missing personnel.

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B. This procedure provides both a primary and a backup method of doing the accou ing in the event of a plant or site evacuation. The primary method depends o the availability of the security computer system and is quick and efficient. The backup method is a manual method which is much slower and not 100% efficient.

PROCEDURE

PART I - Local (or Building) Evacuation

NOTE: This is for a localized area only. The number of personnel involved in a local evacuation is normally small, and involves areas which when occupied, are normally attended by supervisory personnel. The following methods, thus, should be applicable.

STEP 1: Contact the supervisor(s) of the pertinent work party(ies) and verify the presence of individuals in the work party(ies). Initiate Personnel Accountability-Local Evacuation Checklist, Form 5790-205-1 (Attachment 1).

STEP 2: If any individuals are not accounted for they should be paged.

NOTE 1: Their presence on site may be verified by a computer printout of personnel on site (EONS Log), with Security Guardhouse sign-in sheets (for visitors), and/or with other pertinent registers or logs.

NOTE 2: If further verification that all personnel are clear of the area is necessary, consider either a search of the area or a check of dosimeter exposure cards in the ACTIVE racks. A last resort may be a plant evacuation and full accounting.

STEP 3: Advise the Emergency Director to initiate Search and Rescue activities (Procedure A.2-303) if an individual(s) is still unaccounted for and suspected to be in a hazardous area, trapped or injured. Complete Personnel Accountability-Local Evacuation Checklist, Form 5790-205-1 (Attachment 1).

PART IIa - Plant/Site Evacuation - Primary Method

STEP 1: Direct CAS Operator (X-1246) to enter the EEV command to put the security computer in the accounting mode. Initiate checklist, Form 5790-205-2 (Attachment 2).

STEP 2: Notify the OSC Coordinator, R.P. Coordinator and TSC Coordinator to ensure that each person in the various response centers inserts his/her Security Badge into the reader designated for emergency personnel accounting. Further direct a return notification when all personnel are processed.

CAUTION: Caution these people to ensure an orderly proceeding and to make sure that cards are inserted properly to prevent alarms and that the red light is received after each card. If possible, assign one person to insert all cards to prevent tamper alarms due to improper techniques.

STEP 3 Notify the Site Superintendent (in the Control Room) and the Security Shift Supervisor (in the Guard House). Direct that a list of names, initials, and badge numbers be compiled for all personnel in the area. The Control Room list should include the SS Office and the security list should include the CAS, SAS and PCR operators.

STEP 4: If the Substation Assembly Point or an offsite assembly point is activated, notify the CAS Operator and direct that an EVACNT Report be generated as soon as all badges from evacuating personnel have been processed.

If the Warehouse Assembly Point is activated, the Coordinator will notify the Security Group Leader when all personnel have been processed through the card readers. Upon this notification, direct the CAS Operator to generate an EVACNT Report.

In both cases direct that the EVACNT list be transmitted and/or carried to the TSC immediately upon completion along with the list of personnel who reported to the Guard House, the Visitors Log, and the OWNER-CONTROLLED AREA LOG. Also notify the Site Superintendent and direct that the list of personnel in the Control Room be carried to the TSC.

NOTE: During the accounting process, persons attempting to enter the Protected Area will not be permitted to do so. These persons should be held in the Conference Room in the Security Building until the EVACNT list has been printed. After that, individuals may be admitted with permission of the Emergency Director. Requests for such permission should be forwarded through the Security Group Leader.

STEP 5: When the EVACNT list arrives at the TSC, take immediate action to account for anybody whose name appears on the report. As soon as it is recognized that one or more individuals are still missing, immediately attempt to determine the possible location of the individual. Direct appropriate personnel to:

a. Check response centers for late arrivals
b. Page the individual
c. Confer with the individual's supervisors or co-workers
d. Conduct brief searches of the last known location, if possible
e. Call the individuals home
f. Report back with any information relating to a-e

STEP 6: If any individual remains unaccounted for following STEP 5, and the individual may be in a hazardous area, trapped or injured, advise the Emergency Director to implement Search and Rescue Activities (Procedure A.2-303).

STEP 7: Direct CAS operator to enter TEV command to take computer out of the accounting mode and complete Personnel Accountability-Plant/Site Evacuation Checklist, Form 5790-205-2 (Attachment 2).

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PART IIb - Plant/Site Evacuation - Backup Method
(To be used when security computer is not available.)

STEP 1: Direct the CAS Operator (X-1246) to send the most current EONS list to the active assembly point. Initiate checklist, 5790-205-3, (Attachment 3).

STEP 2: Notify the Assembly Point Coordinator to disregard procedure step requiring use of card readers and to assemble personnel in preparation for roll call accounting. Further direct Coordinator to (1) conduct roll call using EONS listing and to cross off names of persons at the assembly point, and (2) to send list to TSC immediately after roll call is complete.

STEP 3: Notify the OSC Coordinator, R.P. Coordinator, TSC Coordinator, Site Superintendent (in Control Room) and Guard House. Direct that a list of names, initials, and TLD numbers be generated for all persons at the various response centers. Further direct that the lists be transported to the TSC as soon as they are completed and that the VISITORS LOG and OWNER-CONTROLLED AREA LOG be included with the list from the Guard House.

STEP 4: When the EONS list arrives at the TSC, reconcile the EONS list with the other response center lists. (Use as many persons as necessary to accomplish this task in a timely manner.)

STEP 5: As soon as it is recognized that one or more individuals are still missing, immediately attempt to determine the possible location of the individual. Direct appropriate personnel to:

a. Check response centers for late arrivals
b. Page the individual
c. Confer with the individual's supervisors or co-workers
d. Conduct brief searches of the last known location, if possible
e. Call the individuals home
f. Report back with any information relating to a-e

STEP 6: If any individual remains unaccounted for following STEP 5, and the individual may be in a hazardous area, trapped or injured, advise the Emergency Director to implement Search and Rescue Activities (Procedure A.2-303). Complete Personnel Accountability-Plant/Site Evacuation Backup Method Checklist, Form 5790-205-3 (Attachment 3).

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

WP/kk

ATTACHMENTS

1. Example of Personnel Accountability - Local Evacuation Checklist, Form 5790-205-1

2. Example of Personnel Accountability - Plant/Site Evacuation Primary Method Checklist, Form 5790-205-2

3. Example of Personnel Accountability - Plant/Site Evacuation, Backup Method Checklist, Form 5790-205-3

WP/kk

ATTACHMENT 1

Form 5790-205-1
Revision 2, 2/13/82
Page 1 of 1

Example of
PERSONNEL ACCOUNTABILITY - LOCAL EVACUATION CHECKLIST
(For Use With Procedure A.2-205)

1. Contacted supervisor(s) of evacuated work party(ies).

   _____ Sec. Group Ldr. _____ Time _____ Date

2. Attempted to locate personnel who were not accounted for.

   _____ Sec. Group Ldr. _____ Time _____ Date

3. Notified ED that:

   a) All personnel have been accounted for,

      _____ Sec. Group Ldr. _____ Time _____ Date

      OR

   b) One or more individuals are missing and could not be located.

      _____ Sec. Group Ldr. _____ Time _____ Date

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

ATTACHMENT 2

Form 5790-205-2
Revision 3, 04/15/83
Page 1 of 1

Example of
PERSONNEL ACCOUNTABILITY - PLANT/SITE EVACUATION
PRIMARY METHOD CHECKLIST

(For Use With Procedure A.2-205)

1. Directed CAS Operator (X-1246) to setup computer for accounting.

   Sec. Group Ldr. _____ Time _____ Date _____

2. Notified TSC, Access Control and OSC to implement accounting via card readers.

   Sec. Group Ldr. _____ Time _____ Date _____

3. Notified Control Room and Guard House to generate lists.

   Sec. Group Ldr. _____ Time _____ Date _____

4. Directed CAS Operator to generate EVACNT List.

   Sec. Group Ldr. _____ Time _____ Date _____

5. Notified response centers to forward lists to TSC.

   Sec. Group Ldr. _____ Time _____ Date _____

6. Reconciled lists.

   Sec. Group. Ldr. _____ Time _____ Date _____

7. Notified ED that:

   a) All personnel have been accounted for,

      Sec. Group Ldr. _____ Time _____ Date _____

   OR

   b) One or more individuals are missing and could not be located.

      Sec. Group Ldr. _____ Time _____ Date _____

8. Directed CAS Operator (X-1246) to take computer out of accounting mode.

   Sec. Group Ldr. _____ Time _____ Date _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

ATTACHMENT 3

Form 5790-205-3
Revision 0, 02/13/82
Page 1 of 1

Example of
PERSONNEL ACCOUNTABILITY - PLANT/SITE EVACUATION
BACKUP METHOD CHECKLIST

1. Directed CAS Operator to send EONS List to Assembly Point.

   _____ Sec. Group Ldr. _____ Time _____ Date

2. Notified Assembly Point Coordinator to use roll call and to send list to TSC upon completion.

   _____ Sec. Group Ldr. _____ Time _____ Date

3. Notified response centers to generate lists and forward to TSC.

   _____ Sec. Group Ldr. _____ Time _____ Date

4. Reconciled lists.

5. Notified ED that:

   a) All personnel have been accounted for,

      _____ Sec. Group Ldr. _____ Time _____ Date

      OR

   b) One or more individuals are missing and could not be located.

      _____ Sec. Group Ldr. _____ Time _____ Date

NOTE After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

Ops. Com. Rev. Req'd. Yes X No ___
Q. A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

EMERGENCY EVACUATION

A.2-301

Prepared by: D.K. Ouzts ALARA Review: C.D. Mathiason Date 4/8/83
Reviewed by: C.D. Mathiason Q.A. Review: Revision 0 Date 3/28/81
Operations Committee Final Review: Meeting Number 1199 Date 4/28/83
Approved by: J.L. Tedesco Date 5-3-83
Op. Com. Results Review: Not Required Mtg. # 948 Date 3/25/81

PURPOSE

This procedure provides instructions for implementing an emergency evacuation of radiologically affected areas within the Monticello Nuclear Generating Plant and adjacent areas onsite. This procedure is applicable to Local, Plant and Site Evacuations; it does not apply to evacuation of members of the general public from affected areas beyond site boundaries.

The basic instructions in this procedure may also be applied as appropriate, to evacuations related to other hazards affecting habitability, such as fire, toxic gas, etc.

CONDITIONS AND PREREQUISITES

A. An emergency condition has occurred at Monticello Nuclear Generating Plant resulting in radiological and/or other hazardous conditions.

B. "Site Area Emergency", Procedure A.2-104 or "General Emergency", Procedure A.2-105 have been implemented.

PRECAUTIONS

A. Prior to implementation of an evacuation, the Emergency Director (Shift Supervisor until relieved) should determine, based on the best information available, that evacuation is the protective action that will result in the lowest personnel exposure. In making an evacuation decision, the Emergency Director should consider (1) dose rates at Assembly Points, on-site, and along evacuation routes; and (2) whether or not these conditions can be mitigated prior to personnel receiving significant exposures.

B. Evacuations should be initiated either before or after the passage of the release, and evacuation routes should be chosen that lead personnel away from the path of the plume.

PERSONNEL REQUIREMENTS

Emergency Director

PROCEDURE

NOTE: The checklists pertaining to this procedure should be completed, but completion of the checklists shall not delay evacuation.

Local Evacuation

NOTE: A Local Evacuation may be initiated by personnel in the affected area in response to observed conditions, survey instrument indications, or locally-alarming radiation monitors. The procedure steps below assume that the evacuation is initiated by indications/alarms observed in the Control Room. As a result, some steps may not be applicable to all Local Evacuations.

STEP 1: Have the following announcement made over the public address system:

> "ATTENTION ALL PERSONNEL: THERE IS A (specify hazard) INDICATED IN (Specify area). ALL PERSONNEL SHOULD EVACUATE FROM THE (Specify area) AND STAY CLEAR OF (specify area).

This message should be repeated twice and additional instructions may be provided as required.

Initiate Emergency Evacuation Checklist, Form 5790-301-1 (Attachment 1).

STEP 2: Ensure that the applicable portion of procedure A.2-205, PERSONNEL ACCOUNTABILITY, is implemented.

STEP 3: Direct the Radiation Protection Group to assume control of entries to the affected area for exposure control purposes.

NOTE: When the hazard has been cleared and the Radiation Protection Group has surveyed the area, allow a return to normal use of the area or establish appropriate access control provisions for restricted use.

STEP 4: Complete Emergency Evacuation Checklist, Form 5790-301-1 (Attachment 1).

Plant Evacuation

STEP 1: Determine which onsite assembly point will be used. Consider wind direction, assembly point capacity and possible habitability problems.

STEP 2: If not already designated, assign an Assembly Point Coordinator. (See Procedure A.2-001 for qualified personnel listing.) Direct Coordinator to implement procedure A.2-302, ASSEMBLY POINT ACTIVATION, if not already implemented.

STEP 3: Direct the Security Group Leader to prepare to implement procedure A.2-205, PERSONNEL ACCOUNTABILITY.

STEP 4: Direct the REC to provide personnel for monitoring and assistance at the Assembly Point.

STEP 5: Direct the Control Room Operator to sound the evacuation siren and to make the following announcement over the public address system:

> "ATTENTION, ALL PLANT PERSONNEL: THIS IS A PLANT EVACUATION. ALL MEMBERS OF THE EMERGENCY ORGANIZATION REPORT TO YOUR DUTY STATIONS. ALL OTHER PERSONNEL PROCEED TO THE (Warehouse/Substation/Other) ON-SITE ASSEMBLY POINT."

The message should be repeated twice and additional instructions may be provided as required.

Initiate Emergency Evacuation Checklist, Form 5790-301-2 (Attachment 2).

STEP 6: Implement the applicable portion of Procedure A.2-205, PERSONNEL ACCOUNTABILITY.

STEP 7: Direct the Radiological Emergency Coordinator to assume control of entries to the affected area for exposure control purposes and to implement procedures A.2-407, PERSONNEL AND VEHICLE MONITORING, and A.2-201, ONSITE MONITORING AND PROTECTIVE ACTION CRITERIA.

STEP 8: When the accounting procedure is completed, direct the removal of unnecessary personnel from the site according to the following:

a. Unnecessary personnel in Control Room, OSC, and TSC should be either sent home or to the assembly point or EOF to Stand-by;

b. Key personnel at the assembly point should be authorized re-entry or directed to Stand-by;

c. Other plant personnel at the assembly point should be sent home or to the EOF;

d. Non-plant personnel at the assembly point should be directed offsite;

e. All personnel in the Owner Controlled Area, including the office trailers and EPA field station, should be directed offsite. (The Security Group should be directed to conduct an orderly evacuation with means available).

STEP 9: Complete Emergency Evacuation Checklist, Form 5790-301-2 (Attachment 2).

Site Evacuation

NOTE: The condition under which a Site Evacuation would be initiated could involve significant release off-site with resultant contamination of environmental surfaces off-site. Under these conditions, delaying Site Evacuation to monitor and/or decontaminate personnel or vehicles would be superfluous, in light of the potential for re-contamination offsite. In this case, personnel should be directed to proceed directly to the upwind offsite assembly area for monitoring. If all offsite assembly areas are within sectors from which the population is being evacuated, the Emergency Director, in cooperation with NSP management, State and County Agencies, shall designate an assembly area at which personnel monitoring will be performed. (Possible offsite assembly areas are the Sherco Plant and the NSP Service Center in Monticello.) In this event, vehicles will be monitored as provided in the Corporate Emergency Plan Implementing Procedures (EPIP 1.1.16).

STEP 1: If time and conditions allow, direct the Radiological Emergency Coordinator to establish appropriate radiological monitoring stations consistent with the guidelines in the above and Procedure A.2-407, (Personnel and Vehicle Monitoring).

STEP 2: Determine which offsite assembly point will be used. Consider wind direction, assembly point capacity and possible habitability problems. Also determine which route will be used to get to the assembly point.

STEP 3: Direct Security to provide appropriate personnel to direct traffic on-site and at the intersection of the site access road and RTE 75 and to handout copies of Form 5790-301-4, SITE EVACUATION INSTRUCTIONS. Depending on other operations, State Police or local police may relieve the security guard directing traffic off-site.

NOTE: Security personnel directing traffic should be equipped with appropriate respirators and protective clothing if radiological conditions warrant. They should also have a supply of Form 5790-301-4, SITE EVACUATION INSTRUCTIONS.

STEP 4: Direct the Control Room Operator to sound the evacuation siren and to make one of the following announcements over the public address system:

> "ATTENTION ALL PERSONNEL: ALL PERSONNEL EXCEPT THOSE WITH EMERGENCY ASSIGNMENTS SHALL PROCEED TO THE PERSONNEL MONITORING STATION AT (Specify location), AND THEN PROCEED TO YOUR CARS AND DRIVE TO THE AUTOMOBILE MONITORING AREA AT (specify location). ONCE RELEASED, PROCEED TO (specify location and route) AND AWAIT FURTHER INSTRUCTIONS."
>
> or,
>
> "ATTENTION ALL PERSONNEL: ALL PERSONNEL EXCEPT THOSE WITH EMERGENCY ASSIGNMENTS SHALL EVACUATE THE SITE IMMEDIATELY. PROCEED IN YOUR CAR TO (specify location and route) AND AWAIT FURTHER INSTRUCTIONS."

The message should be repeated twice and additional instructions may be provided as required. Initiate Emergency Evacuation Checklist, Form 5790-301-3 (attachment 3).

STEP 5: Ensure that the applicable portion of Procedure A.2-205, PERSONNEL ACCOUNTABILITY, is implemented.

STEP 6: If not already implemented, direct Radiological Emergency Coordinator to implement Procedure A.2-201, ON-SITE MONITORING AND PROTECTIVE ACTION CRITERIA. Ensure that assembly points are monitored.

STEP 7 Direct the Security Group to initiate an orderly evacuation of all personnel in the Owner-Controlled Area, including all trailers and the Guard House.

STEP 8 Direct unnecessary personnel in Control Room, OSC and TSC to stand-by at the EOF or to go home.

STEP 9: When conditions allow, release personnel at the assembly point or issue further instructions to them. Key personnel may be authorized re-entry to the site.

STEP 10: Complete Emergency Evacuation Checklist, Form 5790-301-3 (Attachment 3).

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operations Manual

3. NUREG-0654/FEMA-REP-1 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

WP/kk

ATTACHMENTS

1. Example of Emergency Evacuation Checklist-Local Evacuation, Form 5790-301-1
2. Example of Emergency Evacuation Checklist-Plant Evacuation, Form 5790-301-2
3. Example of Emergency Evacuation Checklist-Site Evacuation, Form 5790-301-3
4. Example of Site Evacuation Instructions, Form 5790-301-4

WP/kk

ATTACHMENT 1

Form 5790-301-1
Revision 2, 1/21/82
Page 1 of 1

Example of
EMERGENCY EVACUATION CHECKLIST

LOCAL EVACUATION

(For Use With Procedure A.2-301)

1. Declared and announced a Local Evacuation. _____ _____ _____
ED Initials Time Date

2. Accountability procedure implemented. _____ _____ _____
ED Initials Time Date

3. Access Control assigned to RP Group. _____ _____ _____
ED Initials Time Date

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

ATTACHMENT 2

Form 5790-301-2
Revision 2, 1/21/82
Page 1 of 1

Example of
EMERGENCY EVACUATION CHECKLIST

PLANT EVACUATION

(For Use With Procedure A.2-301)

1. Declared and announced a Plant Evacuation. _____ _____ _____
ED Initials Time Date

2. Accountability procedure implemented. _____ _____ _____
ED Initials Time Date

3. Access Control assigned to RP Group and monitoring procedures implemented. _____ _____ _____
ED Initials Time Date

4. Personnel at Assembly Point released. _____ _____ _____
ED Initials Time Date

5. Unnecessary personnel evacuated. _____ _____ _____
ED Initials Time Date

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

ATTACHMENT 3

Form 5790-301-3
Revision 2, 1/21/82
Page 1 of 1

Example of
EMERGENCY EVACUATION CHECKLIST

SITE EVACUATION

(For Use With Procedure A.2-301)

1. Monitoring station established.

   _____ _____ _____
   ED Initials Time Date

2. Traffic control established.

   _____ _____ _____
   ED Initials Time Date

3. Evacuation and Assembly Point announced.

   _____ _____ _____
   ED Initials Time Date

4. Accountability procedure implemented.

   _____ _____ _____
   ED Initials Time Date

5. Access Control assigned to RP Group and monitoring procedures implemented.

   _____ _____ _____
   ED Initials Time Date

6. Owner Controlled Area evacuated.

   _____ _____ _____
   ED Initials Time Date

7. Unnecessary personnel evacuated from plant.

   _____ _____ _____
   ED Initials Time Date

8. Personnel at Assembly Point released or given further instructions.

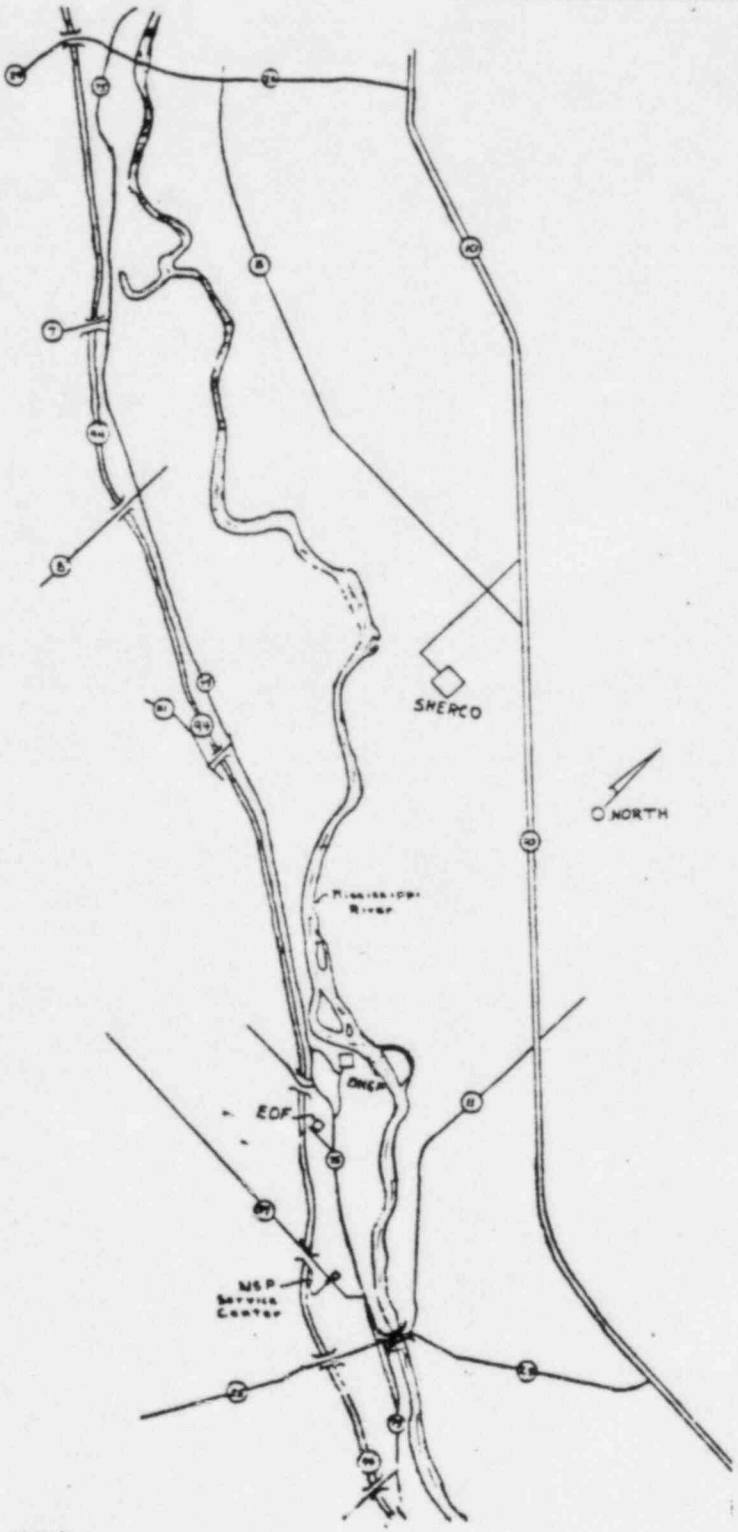
   _____ _____ _____
   ED Initials Time Date

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

Form 5790-301-4
Revision 0, 01/30/82
Page 1 of 1

ATTACHMENT 4
Example of
SITE EVACUATION INSTRUCTIONS



Evacuation Routes

To SherCo

A. West access road to 75
Right on 75 to 24
Right on 24 to 8
Right on 8 to SherCo Assembly Po

B. South access road to 75
Left on 75 to 25
Left on 25 to 11
Left on 11 to 10
Left on 10 to SherCo Access

To NSP Monticello Service Center

C. South access road to 75
Left on 75 to 39
Right on 39 to Service Center

INSTRUCTIONS

1. Proceed to offsite Assembly Point along designated route.
2. Keep windows rolled up; turn heaters and air conditioners off.
3. Do not smoke, eat or drink.
4. Do not leave Assembly Point until released.

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes ___ No X

ACTIVATION OF THE ASSEMBLY POINT

A.2-302

REVIEW AND APPROVAL

Prepared by: [signature] ALARA Review: Revision 0 Date 3/27/81
Reviewed by: [signature] Q.A. Review: Revision 0 Date 3/28/81
Operations Committee Final Review: Meeting Number 1199 Date 4/27/83
Approved by: [signature] Date 5-3-83
Op. Com. Results Review: Not Required Mtg. # 948 Date 3/25/81

PURPOSE

This procedure provides information and instruction for the organization, activation and operation of the on-site Assembly Points in support of the Monticello Nuclear Generating Plant and NSP Emergency Plan.

CONDITIONS AND PREREQUISITES

An emergency condition which may require plant or site evacuation has been declared at the Monticello Nuclear Generating Plant.

PRECAUTIONS

In the event of a radiological release at MNGP, the Assembly Point may be found unsafe for habitation. If such a situation occurs, the Emergency Director must be immediately contacted and informed of conditions.

ORGANIZATION AND RESPONSIBILITIES

A. Emergency Director - Overall In-Charge
Responsible for decision to evacuate.

B. Assembly Point Coordinator- In charge of Assembly Point (reports to Emergency Director). Responsible for implementation of this procedure.

C. Radiation Protection Specialist - Assists Assembly Point Coordinator.
Responsible for ensuring radiation protection procedures are followed.

WP/kk

DISCUSSION

A. Assembly Point Operation

The function of the Assembly Point is to provide a center for personnel accountability and radiological contamination screening along with any other immediately necessary actions in the event of a Plant Evacuation.

The steps in this procedure assume an orderly evacuation in which some time is available for staging. In the event that there is no time for preparation, some of the steps in this procedure may have to occur out of sequence or simultaneously. The persons who are candidates for Assembly Point Coordinator should be familiar with the intended function of the Assembly Point so that this procedure can be adjusted to fit the circumstance.

B. Location

The primary on-site Assembly Point is located east of the reactor building, in the south end of Warehouse #1. The assembly coincides with the cold machine shop. An alternate on-site Assembly Point is located approximately 1000 feet south of the reactor building across from the substation.

The off-site Assembly Points are located at the Monticello Service Center and at the SherCo Plant.

C. Data and Information Resources

Each On-Site Assembly Point contains the following:

1. Monticello Emergency Plan Drawings
2. Appropriate Emergency Plan Implementing Procedures
3. Emergency Preparedness Telephone Directory

D. Communications

1. On-Site Assembly Points have plant telephone extensions and the Assembly Point Coordinator will be issued a portable radio for communications with all emergency response centers.

E. Equipment and Facilities

Each On-Site Assembly Point contains the following:

1. 10 (0-200 mR) pocket dosimeters and charger
2. 10 badges
3. 1 dose rate meter
4. 1 GM survey meter
5. 1 air sampler with supply of particulate filters, charcoal and Silver Zeolite cartridges
6. 1 decontamination kit
7. 10 sets of protective clothing

WP/kk

E. Equipment and Facilities (Cont'd.)

8. Radiation barrier tape/rope and radiation signs
9. First aid kit
10. Stationary supplies
11. Portable generator
12. RM-14 with HP-210 probe and power cords
13. Flashlights and batteries
14. 50 foot extension cords
15. Water sampler and poly bottles
16. Emergency survey team kit and duffel bag

NOTE: No equipment is stored at the off-site Assembly Points.

PROCEDURE

PART I - ACTIVATION

STEP 1 Proceed to the TSC. Ask the Emergency Director which Assembly Point will be activated. Contact the Security Group Leader and arrange for security force member to assist at Assembly Point. Collect the following items before proceeding to the designated assembly point:

a. Keys to assembly point (from Shift Supervisor)
b. Baseball cap with Assembly Point Coordinator designation

Initiate ASSEMBLY POINT ACTIVATION CHECKLIST, Form 5790-302-1 (example: Attachment 3).

STEP 2 At the assembly point, unlock applicable doors and position radiation barrier rope for contamination control and radiological screening. String rope from point A to B (and from C to D at the warehouse location) as depicted in Attachments 1 and 2, ON-SITE ASSEMBLY POINT DIAGRAMS.

STEP 3 Contact the CAS Operator (X-1246) and verify that the security computer is set up for accountability.

STEP 4 Direct Radiation Protection personnel to set up step-off pad(s) and frisker(s) at point F (as designated in Attachment 1) and to conduct a radiological survey of the area.

STEP 5 Contact the TSC and notify the Security Group Leader that the Assembly Point is prepared for a plant evacuation.

PART II - OPERATION

STEP 1 If the warehouse location is being used, channel all evacuees from the Cold Shop area, through the classroom and into the radiological holding area. Ensure that each person properly inserts his (her) security badge into one of the card readers at point G (see Attachment 1) and that the red light is received after each card.

NOTE: Time is important. Use both readers and do what is necessary to keep the process moving until all evacuees, including the Radiation Protection personnel and yourself, have been processed through the card readers.

STEP 2 If the warehouse location is being used, contact the TSC and notify the Security Group Leader as soon as the last of the evacuees has been processed.

NOTE: Once the Security Group Leader has been contacted, it is very important to start a sign-in sheet for all persons arriving subsequently at the Assembly Point. Maintain the sign-in process (use Form #5790-107-1) until notified that the accountability procedure is completed.

STEP 3 Direct personnel in the radiological holding area to pass through the control point, using the frisker to detect contamination as they do so. A Radiation Protection Specialist should be available at the control point to oversee this process. Contact the TSC and notify the REC of any contamination and when the radiological screening is complete.

STEP 4 Keep all personnel at the Assembly Point unless and until directed otherwise.

STEP 5 If available, direct Radiation Protection personnel to survey, and clear if possible, the radiological holding areas (and also the classroom and south end of the Cold Shop if applicable).

STEP 6 Maintain communications with the TSC. Keep appropriate TSC personnel apprised of status.

STEP 7 Release personnel when so ordered by the Emergency Director and complete the checklist.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan
2. Monticello Nuclear Generating Plant Operations Manual
3. NUREG-0654/FEMA-REF-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

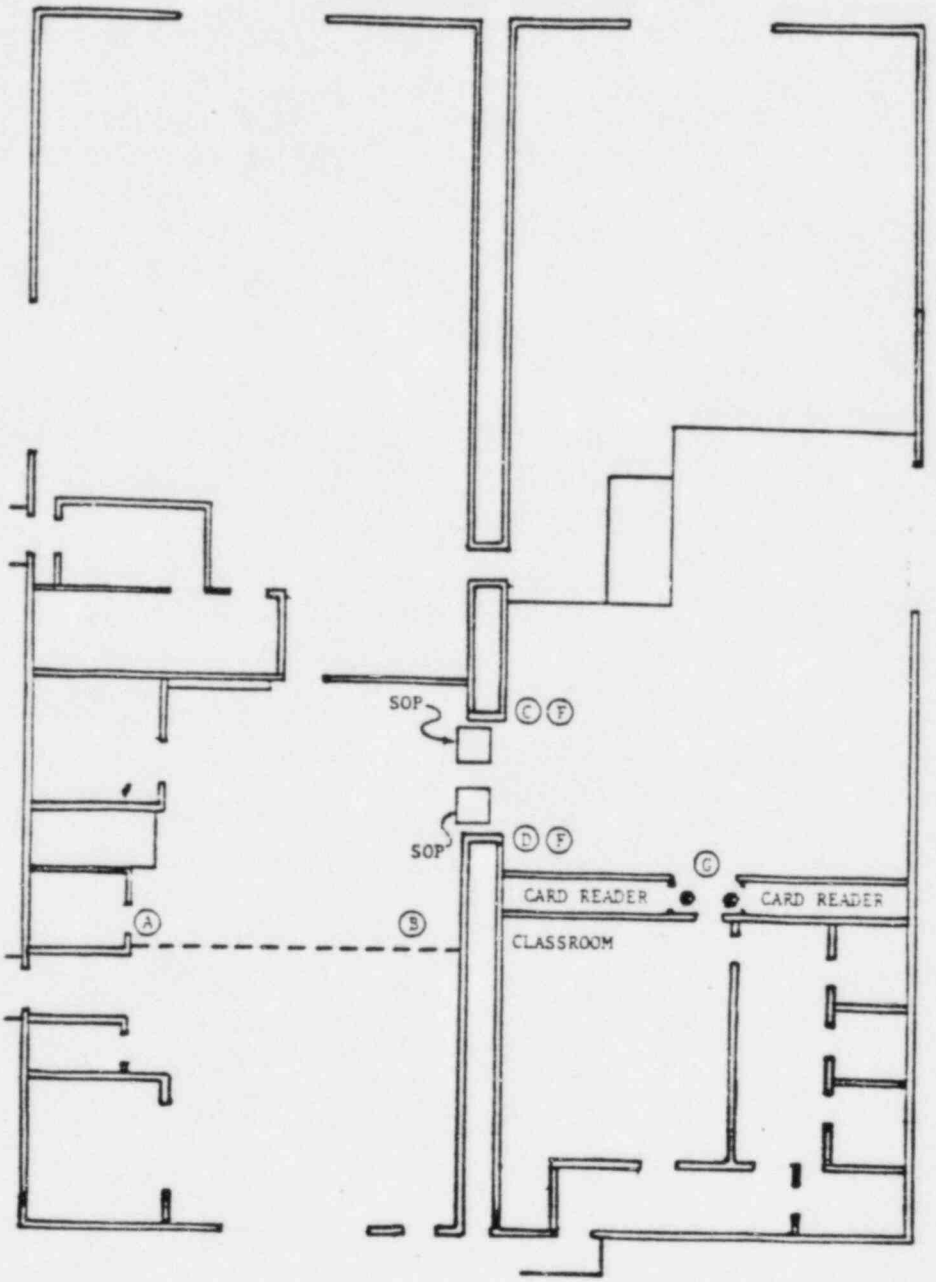
ATTACHMENTS

1. On-Site Assembly Point Diagrams
2. On-Site Assembly Point Diagrams
3. Example of Assembly Point Activation Checklist

WP/kk

ATTACHMENT 1

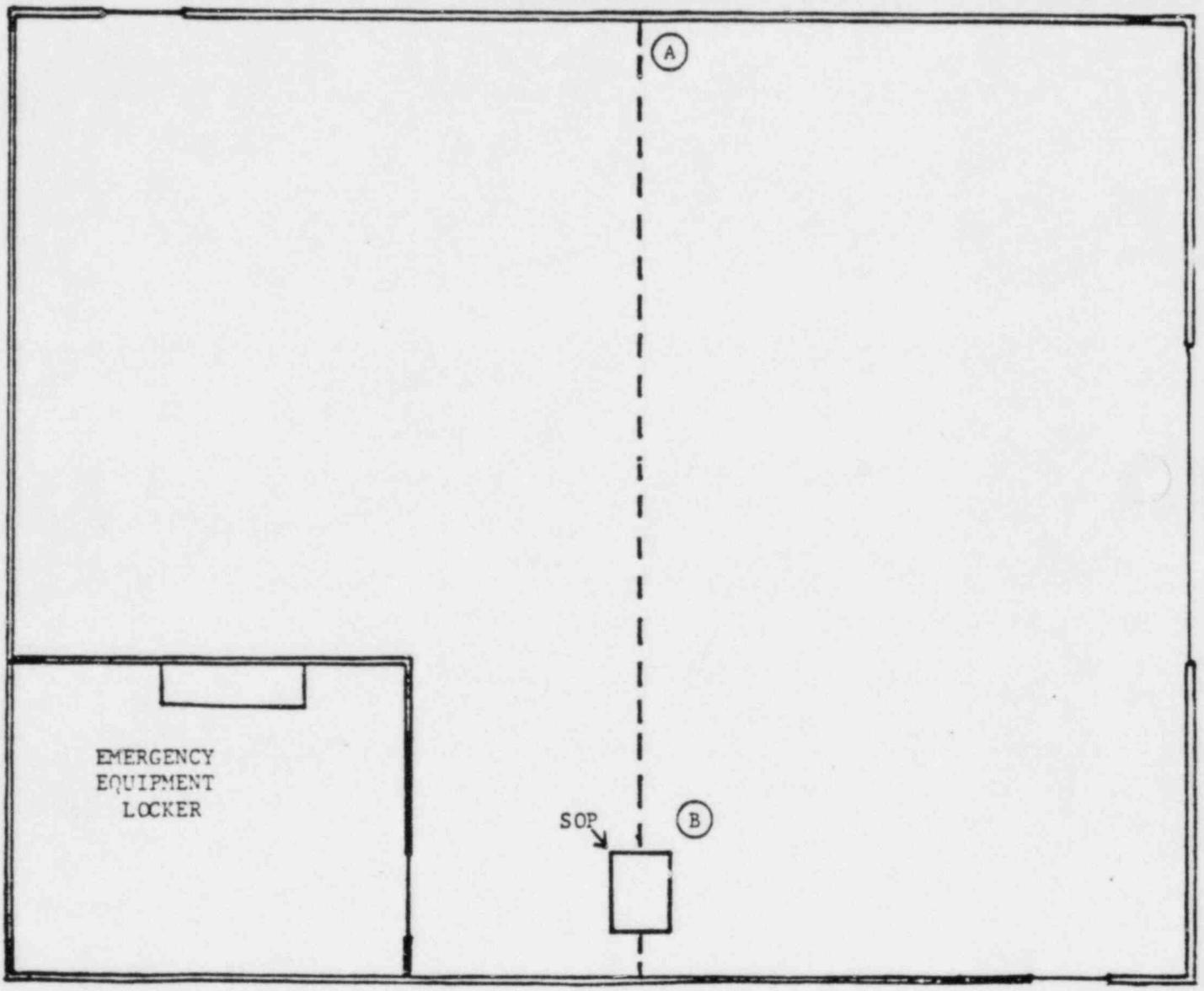
WAREHOUSE ASSEMBLY POINT



WP/kk

ATTACHMENT 2

SUBSTATION ASSEMBLY POINT



WP/kk

Form 5790-302-1
Revision 2, 2/02/82
Page 1 of 1

ATTACHMENT 3

Example of
ASSEMBLY POINT ACTIVATION CHECKLIST
(For Use With Procedure A.2-302)

		APC Initials	Time	Date
1.	Assumed the responsibilities of Assembly Point Coordinator.			
2.	Security computer ready for accountability.			
3.	Survey of Assembly Point Area initiated and radiological control point established.			
4.	Emergency Director notified that Assembly Point is prepared for evacuation.			
5.	If warehouse location is activated, notified Security Group Leader when all evacuees were processed.			
6.	Completed radiological screening and so notified REC.			
7.	Released Assembly Point personnel on order from Emergency Director.			

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for the Emergency Records.

WP/kk

Op. Com. Rev. Req'd. Yes X No
Q.A. Review Req'd. Yes No X
ALARA Review Req'd. Yes X No

SEARCH AND RESCUE

A.2-303

REVIEW AND APPROVAL

Prepared by: [signature]	ALARA Review: [signature]		Date 4/11/83
Reviewed by: [signature]	Q.A. Review: Revision 0		Date 3/26/81
Operations Committee Final Review: Meeting Number		1199	Date 4/28/83
Approved by:		[signature]	Date 5-3-83
Op. Com. Results Review: Not Required		Mtg. # 949	Date 3/26/81

PURPOSE

This procedure provides instructions pertaining to in-plant search and rescue operations if required to locate and/or rescue personnel who are unaccounted for during or following an emergency.

CONDITIONS AND PREREQUISITES

A. One or more individuals are missing following an evacuation of an affected area, or

B. A report has been received of personnel trapped and/or disabled within the plant.

PRECAUTIONS

Permissible exposures incurred during search and rescue operations are governed by A.2-401, "Emergency Exposure Control".

PERSONNEL REQUIREMENTS

Emergency Team Leader
Emergency Teams

ORGANIZATION

A. Overall Responsibility - Emergency Director

B. In Charge - Emergency Team Leader

C. Assistance

1. Emergency Team Members
2. Radiation Protection Group

RESPONSIBILITIES

A. Emergency Director

1. Appoint Emergency Team Leader.

B. Emergency Team Leader

1. Select Emergency Team Members.
2. Instruct Team Members on probable locations of missing personnel and expected dose rates.
3. Ensure that proper equipment and first aid supplies are obtained to perform necessary action.

C. Emergency Team Members

Perform search and rescue.

D. Radiation Protection Group

Provide radiological information and emergency exposure control.

DISCUSSION

A. If an individual is trapped or disabled in a high radiation area, the rescue must be performed as expeditiously as possible to minimize the dose to the victim and the doses to the rescue personnel, and to ensure that first aid can be provided as soon as possible.

B. In an emergency situation, an exposure of 75 rem to rescue and first aid personnel is appropriate if necessary to save a life. Refer to A.2-401 (Emergency Exposure Control).

C. Rescue of a victim shall take precedence over fire-fighting or damage control efforts, unless such actions are necessary to effect rescue, or to relieve an immediate threat to the lives of other personnel.

D. Rescue of a victim shall take precedence over isolation of steam, hot water under pressure, hydraulic fluids, etc., unless such isolation is necessary to effect rescue; or if failure to isolate will seriously affect reactor safety or will place the lives of other personnel in immediate danger.

E. Emergency Team Members should be selected from volunteers, as these operations could involve high exposure and risk.

PROCEDURE

STEP 1: Upon notification of missing/trapped/disabled individuals, select Team Members from available personnel and direct Emergency Team in search and rescue operation.

NOTE: An emergency team shall be composed of a minimum of two individuals, one of which should be a Radiation Protection Specialist.

WP/kk

STEP 2: The Emergency Team Leader shall ensure that members of the team:

a. are briefed on the estimated or expected radiological conditions in the plant.

b. are aware of actions to be taken if unexpected radiological conditions are encountered.

STEP 3: Obtain necessary equipment and dosimetry. Don protective clothing and any respiratory equipment required by the Health Physics Group (RWP). If exposure limit extensions are necessary, refer to Procedure A.2-401, Emergency Exposure Control.

STEP 4: Proceed to the designated search area as directed by the Emergency Director or his designee, while maintaining radio contact. The RPS should lead the team while monitoring the radiological conditions.

STEP 5: Provide the following information, as known:

a. Location of victim
b. Extent of injuries
c. Additional assistance required, if necessary
d. Complications affecting rescue

STEP 6: Perform search and/or rescue operation as expeditiously as possible.

a. If the individual(s) cannot be moved immediately, first aid should be applied as necessary.

b. If appropriate, move the individual to the closest safe area and apply first aid as necessary.

c. Evaluate the condition of the individual:

(1) If the individual is injured and requires off-site medical treatment, refer to MNGP Operations Manual, Procedure A.5-100.

(2) If the individual has or may have received a biologically significant overexposure, report to Radiological Emergency Coordinator.

STEP 7: Complete all necessary forms and submit to appropriate group for recording and filing.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan
2. Monticello Nuclear Generating Plant Operations Manual
3. NUREG-0654/FEMA-REP-1, "Critieria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

ATTACHMENTS

None
WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

IN-PLANT EMERGENCY SURVEYS

A.2-403

Prepared by: D L Quarock ALARA Review: C O Mathiason Date 4/14/83
Reviewed by: C O Mathiason Q.A. Review: Revision 0 Date 3/28/81
Operations Committee Final Review: Meeting Number 1199 Date 4/28/83
Approved by: J L Fay Date 5-3-83
Op. Com. Results Review: Not Required Mtg. # 949 Date 3/26/81

PURPOSE

The purpose of this procedure is to provide instruction and guidance on conducting radiation surveys during an emergency condition that could involve high dose rates, and/or high airborne/surface contamination levels in the survey area and the means by which monitoring equipment and supplies will be obtained.

CONDITIONS AND PREREQUISITES

A. An emergency condition has been declared at the Monticello Nuclear Generating Plant as provided by the MNGP Emergency Plan.

B. A survey within the plant is necessary.

C. Radiological conditions in the survey area may involve high dose rates, high airborne/surface contamination levels, and/or high levels of beta radiation.

PERSONNEL REQUIREMENTS

Radiation Protection Specialist(s) - to conduct survey and analyze samples.
Monitoring Section Leader (MSL) - to identify survey requirements and review results.
Radiological Emergency Coordinator (REC) - in charge.
Radiation Protection Coordinator (RPC) - Provide field support for the REC and MSL.

PRECAUTIONS

A. In general, ion chamber instruments should be used to measure dose rates. Do not use a GM instrument (except Teletector) in a high level radiation field because the detector may saturate causing the instrument to erroneously read "zero" or below scale.

B. If an instrument malfunctions or "pegs" out during survey operations, immediately exit the area by the same route used to enter it, and obtain a new instrument if necessary. A malfunctioning instrument should be appropriately tagged.

C. Take care not to contaminate or damage survey instruments. Particular care should be exercised to avoid damage to the beta window of a beta-gamma instrument.

WP/kk

D. Ensure that appropriate protective clothing and equipment (e.g. respirators) is worn by all members of the survey party. If there is a potential for high beta dose rates, use protective eyewear.

E. Exposures of personnel in the survey party shall be in accordance with MNGP administrative control levels. Monitoring teams must remain alert to their own exposure and request relief if their cumulative exposures approach these levels. The Emergency Director may authorize exposure limit extensions, if necessary (A.2-401). All exposures shall be maintained as low as reasonably achievable by employing the following methods or techniques:

1. Limit the number of personnel in the survey party to the minimum number necessary to perform the survey in a safe and efficient manner.

2. If time is available, plan the survey in advance to ensure gathering a maximum amount of data in a minimum time period. Conduct a pre-survey briefing to ensure all members of the party understand their tasks.

3. Ensure that the party has all equipment and supplies it needs, including survey maps and forms. Pre-number smears and take other measures to minimize time in the radiation field.

4. Use extendable probe instruments (such as the Teletector) to minimize exposure when monitoring "hot spots" or hard to reach areas.

5. Use available equipment or structures as shielding when appropriate.

F. Alarming dosimeters should be considered in addition to high range self-reading dosimeters.

G. Careful attention shall be given to the safety of the survey party, both radiological and physical. The "buddy" system should be adopted for all entries into the affected area, where necessary to assure the physical safety of the personnel conducting the survey. However, the number of instruments and measurements required and the need for a rapid but thorough appraisal of the conditions within the accident site also dictate the need for more than one individual per survey party. If there is more than one person in the survey party, an RPS with a dose rate meter will lead the group.

DISCUSSION

A. An essential part of coping with any radiation emergency is a prompt assessment of the radiation status at the site of the event and in surrounding areas. Early detection of changing conditions can prevent the involvement of large numbers of personnel and larger areas of the Event Site.

B. Surveys of the event site with portable survey instruments are necessary to provide basic data on the radiological situation. Careful planning can limit the exposure of emergency personnel. Keep in mind during this planning that:

1. The location of the sources of radiation may be unknown.

2. Physical safeguards may have been destroyed.

3. The physical process or reaction that caused the emergency may still be occurring.

C. The survey should be designed to obtain gross answers concerning the status of the facility. Precise answers are not required immediately and may never be required. In order to conserve time, no attempt should be made to correct instrument readings. This refinement can be made at a later time based on the data accumulated from the survey and the instrument capabilities.

D. Techniques such as use of the attenuation of the surveyor's body or other objects to assist in locating the radiation source(s) are useful.

E. After the radiation levels have been determined, the magnitude and extent of the surface and airborne contamination spread should be established. The survey may entail the measurement of surface contamination levels directly or it may require the collection of smears for evaluation outside of the event site.

F. Determine/discuss the dose rates to be expected during the conduct of this procedure.

G. The use of the PAS System should be considered for taking gaseous samples in lieu of Attachment 2.

PROCEDURE

STEP 1 Plan the survey. Considering the objective of the survey, expected radiological conditions and any other pertinent circumstances, initiate an Emergency RWP Checklist (Form #5790-107-2) for the survey. Specify the equipment to be used, protective clothing requirements, and the particulars of the survey.

STEP 2 Collect required equipment from either normal inventory or from emergency lockers. Check radios and instruments for operability and proper response.

STEP 3 Don protective clothing and equipment. Establish communications with Access Control and maintain communications throughout the conduct of the survey. Notify REC/MSL that survey party is ready to commence survey. Standby for approval from REC/MSL.

STEP 4 When the REC/MSL so directs, commence survey in accordance with pre-planning. While enroute to the assigned survey location, and at any other time while moving about the plant, have the survey instrument turned on (with the beta window open, if applicable). Frequently observe the survey meter and report readings to Access Control. Record abnormal readings or other readings having special significance.

STEP 5 Approach survey location with caution and continue to monitor dose rates frequently. Take samples of surface contamination, airborne contamination samples, and dose rates as planned. Record data as required. Refer to Attachment 2 for Gaseous Sampling Procedure.

STEP 6 Leave the affected area as planned. Analyze any air samples or smears in accordance with Attachment 1.

STEP 7 Record all survey results on plant survey forms. Deliver results to RPC who will relay results to the MSL or REC.

WP/kk

ATTACHMENT 1

Air Sample and Smear Analysis

PRECAUTIONS

1. Take proper radiological precautions while handling samples, samples could contain high activity levels.

2. Insure samples are properly bagged to prevent contamination of the counting facility.

PROCEDURE

Part I Particulate Filters

STEP 1 Count the filter with an RM-14. If the countrate is < 50,000 cpm refer to Table 1 for method of analysis. If the countrate is too high to be determined with an RM-14, measure the dose rate with a Radector III and refer to Table 1 for method of analysis.

Part II Charcoal and Silver Zeolite Cartridges

STEP 1 Count the cartridge with an RM-14. If the countrate is < 50,000 cpm refer to Table 1 for method of analysis. If the countrate is too high to be determined with an RM-14, measure the dose rate with a Radector III and refer to Table 1 for method of analysis.

NOTE 1: If the cartridge dose rate is greater than 10 mR/hr perform a purge of the cartridge by placing the cartridge in a sample holder and purging with service air for five minutes in the hot lab sample hood. Repeat STEP 1.

Part III Smears

STEP 1 Count the smear with an RM-14. If the count rate is <50,000 cpm refer to Table 1 for method of analysis. If the count rate is too high to be determined with an RM-14, measure the dose rate with a Radector III and refer to Table 1 for method of analysis.

WP/kk

Attachment 1 (Cont'd.)

TABLE 1

	≤ 10,000 cpm	≥ 10,000 cpm ≤ 50,000 cpm	≥ 50,000 cpm ≤ 10 mR/hr	≥ 10 mR/hr
Particulate Filter	ASC (Formula #1) or GeLi (Formula #3)	RM-14 (Formula #2) or GeLi (Formula #3)	GeLi (Formula #3)	Radector III 1 Foot Reading (Formula #4)
Charcoal Filter	Well Counter (Formula #5) or GeLi (Formula #3)	Well Counter (Formula #5) or GeLi (Formula #3)	GeLi (Formula #3)	Radector III (Note 1) 1 Foot Reading (Formula #6)
Silver Zeolite	Well Counter (Formula #7) or GeLi (Formula #3)	Well Counter (Formula #7) or GeLi (Formula #3)	GeLi (Formula #3)	Radector III (Note 1) 1 Foot Reading (Formula #6)
Smear	ASC (Formula #8)	RM-14 (Formula #9)	Radector III (Formula #10)	Radector III (Formula #12)
Gas	RM-14 (Formula #11) or GeLi (Formula #3)	RM-14 (Formula #11) or GeLi (Formula #3)	GeLi (Formula #3)	Radector III (Formula #12)

NOTE: Refer to Table 2 for formulas.

WP/kk

Attachment 1 (Cont'd.)

TABLE 2

NOTE: Sample Volume in cc's = ft^3/min x 2.83E4 x sample time
or = lpm x 1000 x sample time

1. $\frac{\text{Net CPM}}{\text{(ASC Efficiency) (Sample Volume) (2.11E6)}}$ = µCi/cc

   Formula assumes 95% filter efficiency.

2. $\frac{\text{Net CPM}}{\text{(2.11E5) (Sample Volume)}}$ = µCi/cc

   Formula assumes 10% detector efficiency and 95% filter efficiency.

3. Count for 600 seconds then do one of the following as directed by the REC:
   Run GAMMAK
   Run GAMMA
   Run GAMMAK and Run MPRAIR

4. $\frac{\text{1 ft dose rate in mR/hr x 610 µCi/mR/hr}}{\text{Sample Volume}}$ = µCi/cc

   (Formula based on .5 Mev gammas and .5 gammas per disintegration)

5. $\frac{\text{Net CPM}}{\text{(1.24E5) (Sample Volume)}}$ = µCi/cc
   (based on a 70% filter efficiency for I-131)

6. $\frac{\text{1 foot dose rate in mR/hr x 420 µCi/mR/hr}}{\text{(Sample Volume)(Filter Efficiency)}}$ = µCi/cc

   (Activity based on I-131)
   Use efficiency of .7 for charcoal filter
   Use efficency of .99 for Silver Zeolite

7. $\frac{\text{Net CPM}}{\text{(1.76E5) (Sample Volume)}}$ = µCi/cc
   (based on a 99% Filter Efficiency for I-131)

8. $\frac{\text{Net CPM}}{\text{instrument efficiency}}$ = DPM/100 cm^2

9. $\frac{\text{Net CPM}}{.1}$ = DPM/100cm^2

10. Report results in 1,000,000 dpm/mR/hr

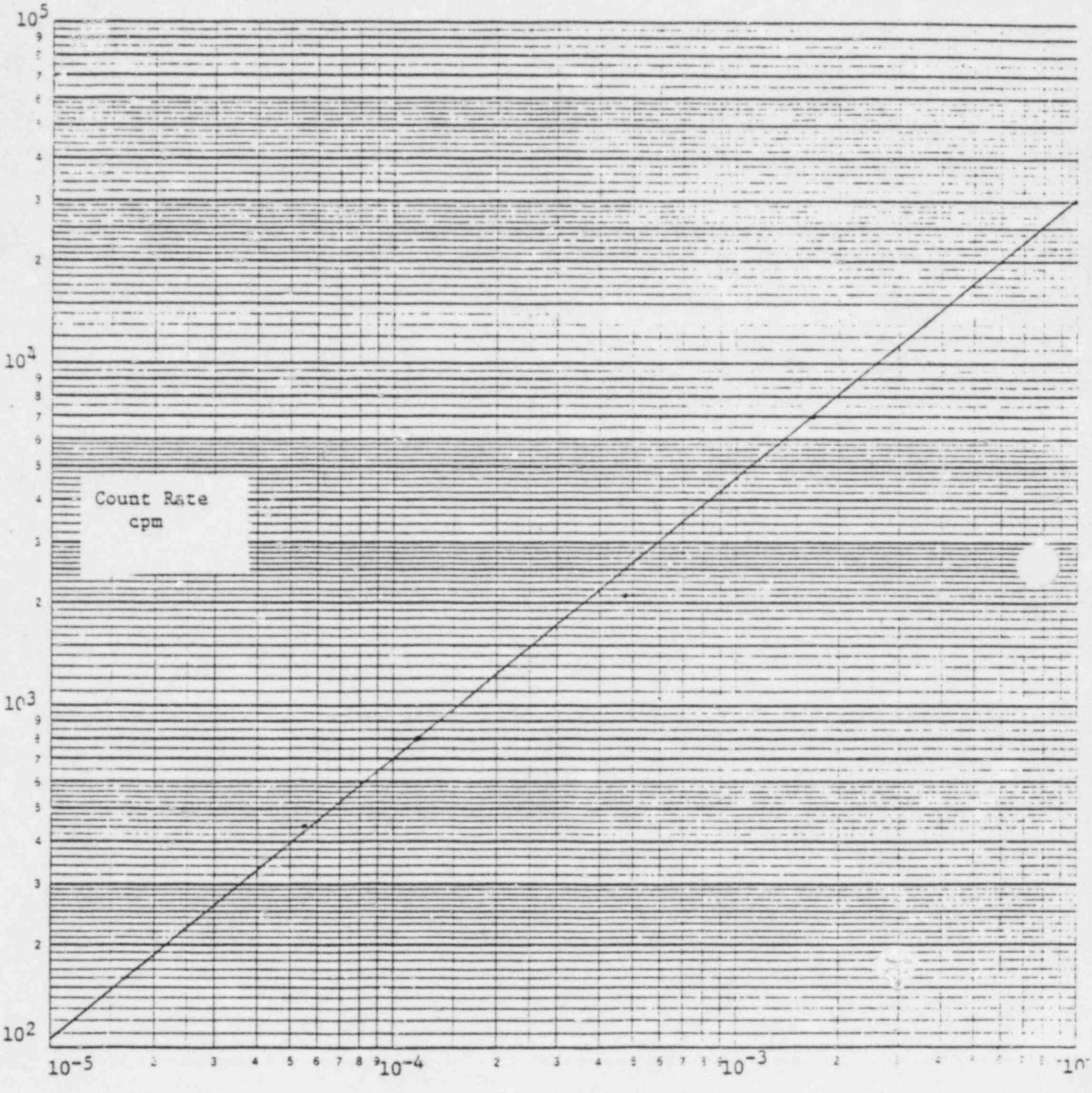
11. Determine net CPM and refer to Figure 1 for activity determination.

12. Report results in mR/hr.

WP/kk

GAS CHAMBER CALIBRATION CURVE

(100 cc S.S.)



Attachment 2

Gaseous Sampling and Analysis

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

STEP 2 Install a clean filter in the filter assembly.

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

STEP 4 Open the stop cocks on the gas chamber.

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

STEP 6 Shut the stop cocks on the gas chamber.

STEP 7 Count the gas chamber with an RM-14. If the count rate is < 50,000 cpm refer to Table 1 for method of analysis. If the count rate is too high to be determined with an RM-14, measure the dose rate with a Radector III and refer to Table 1 for method of analysis.

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes ___ No X

OFF-SITE DOSE PROJECTION

A.2-406

REVIEW AND APPROVAL

Prepared by: [signature] ALARA Review: Revision 0 Date 3/29/81

Reviewed by: [signature] Q.A. Review: Revision 0 Date 3/29/81

Operations Committee Final Review: Meeting Number 1198 Date 4-21-83

Approved by: [signature] Date 4.29-83

Op. Com. Results Review: Not Required Mtg.# 949 Date 3/26/81

PURPOSE

The purpose of this procedure is to provide guidance and instructions for estimating off-site doses resulting from an unplanned and/or abnormal airborne release of radioactive material. The main body of this procedure identifies criteria and guidelines for dose projection, such as how often it should be performed, and which dose projection method to use. The attachments to this procedure provide instructions for performing dose projection using the various methods. Alternate methods are provided to cover possible contingencies such as offscale monitors, inoperative instrumentation, etc.

CONDITIONS AND PREREQUISITES

A. An emergency condition has been declared at Monticello Nuclear Generating Plant as provided in the Emergency Plan.

B. An airborne release of radioactive materials in excess of environmental technical specifications has occurred, is suspected to have occurred, or is imminent.

PRECAUTIONS

Precautions are verified in the text of the applicable attachment(s).

ORGANIZATION

Responsible- Radiological Emergency Coordinator
In-Charge - Off-Site Dose Assessment and Chemistry Section Leader
Assistance - Radiation Protection Specialist

DISCUSSION

A. General Applicability

The region surrounding the plant site is divided into sixteen 22 1/2 degree sectors. The regions of interest extend from the effluent release points out to fifty miles in each sector. Contained within the regions of interest are special locations of interest. The special locations are the site

boundary and the nearest receptor. The site boundary and the nearest receptor locations differ for each sector.

B. Dose Projection Methods

This procedure provides 2 different methods for performing dose projections. The method(s) used will depend on the availability of release and meteorology information and the operability of computers. They appear as attachments to this procedure with Attachment 1 being the most preferred method and Attachment 2 being the least preferred.

1. Dose Projection By Computer (MODCOM)

The Monticello Off-Site Dose Computation System (MODCOM) is a computerized atmospheric dispersion and radiological dose assessment software system. The system is specific for the Monticello Nuclear Generating Plant and is structured in the form of an executive main program (MODCOM) and several subprograms. The software system is coded in a high level interpretive language called C.L.A.S.S.. The software runs on Digital Equipment Corporation computer systems which are located at the plant site.

Data required for input to the software system are: (1) meteorlogical information acquired from the meteorological tower (MET Tower) S.E.D.A.R. computer system, and, (2) plant stack and R.B. ventilation radioactive airborne effluents release rate information acquired from effluents monitors or dose rate readings converted to release rates. Wind direction data is used to determine the correct sector. Wind speed data is used to determine the plume dispersion parameters and maximum plume distance. Temperature difference values are used to determine the plume dispersion parameters. The plume is assumed to completely fill the sector in which it is located.

Release rate data is combined with dispersion data to yield dose rate data. The release rate data is input in the form of μCi/sec for noble gases, iodines, and particulates for the plant stack and Reactor Building ventilation release points. Whole body and thyroid dose factors as well as default nuclide concentration ratios are contained in system mass storage files for use in calculating dose rates. Data is accumulated into the program at 15, 30, or 60 minute intervals. The program computes dose rates at the site boundary, the nearest receptor, and out to the maximum plume distance which may be anywhere from one mile to 10 miles in one mile increments.

The dose rate values are reported in mrem/hour. The dose rate values are converted to an accumulated dose for that period. The dose values are then stored according to sector for the whole body and thyroid. During the course of an accident, dose values are accumulated in several sectors, as the stack plume and R.B. vents plume are sometimes not in the same sector, and wind direction shifts will cause the accumulated doses to be placed into several different sectors over a period of time. Accumulated dose information may be extracted from storage and read out according to sector, or a specific distance from the plant for all sectors. Accumulated dose information is reported in "mrem".

NOTE: Thyroid doses are calculated for the child thyroid.

2. Dose Projection By Hand Calculation

This method calculates the whole body and thyroid doses in the event that the computer systems are not available.

PROCEDURE

STEP 1: When directed by the Radiological Emergency Coordinator or the Emergency Director, perform off-site dose projections in accordance with Attachments 1 or 2. Attachment 1 is the most preferred method and Attachment 2 is the least preferred method.

STEP 2: Continue doing dose projections until otherwise directed by the Radiological Emergency Coordinator or Emergency Director.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. NUREG-0654/FEMA-RFP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans for Preparedness in Support of Nuclear Power Plants"

ATTACHMENTS

1. Dose Projection by Computer (MODCOM)
2. Dose Projection by Hand Calculation
3. Example of Off-Site Dose Projection Worksheet
4. Obtaining Meteorological Data From Weather Information Service
5. Program Example

WP/kk

ATTACHMENT 1

DOSE PROJECTION BY COMPUTER (MODCOM)

PREREQUISITES

1. Proceed to the Body Count Room and place the computer system in the time-sharing mode (TYPE "Control-C", then RUN TSGO).

2. Proceed to the TSC and turn on the Plant Computer CRTs, if this has not already been done. Release and meteorological data must be available for this method.

PROCEDURE

STEP 1: Turn on the dose projection printer. Depress the return key and the terminal will print:

TSX Version CI07E (Date-Time)

STEP 2: Type in "RUN CLASS" and press carriage return. The terminal will respond with:

CLASS V04.24-RT
(DATE)

NOTE: System operation may be verified by running program and using information from Attachment 5.

STEP 3: Type in "RUN MODCOM" and press carriage return. The terminal will respond with:

INITIAL EVALUATION ? :

STEP 4: Respond as follows:

CAUTION: Do not respond with "Y" unless this is the first post-release execution of this procedure, as all stored data will be lost.

a. If this is the initial evaluation, type in "Y" and press carriage return. The terminal will respond with "ARE YOU SURE?". Respond with "YES", the terminal will respond with "PLEASE ENTER THE OPTION YOU DESIRE:".

b. If this is a subsequent evaluation, type in "N" and press carriage return. The terminal will respond with:

PLEASE ENTER THE OPTION YOU DESIRE:

ATTACHMENT 1 (Cont'd.)

Page 2 of 4

STEP 5: Select one of the following options:

OPTION	DESCRIPTION
1	PERFORM TYPICAL DOSE RATE CALCULATION
2	LIST ACCUMULATED DOSES FOR ANY SECTOR (A-R)
3	SEARCH ALL SECTORS FOR HIGHEST DOSE AND REPORT DOSE DATA
4	PRINT ALL SECTOR DOSES (A-R) AT A SPECIFIED DISTANCE
5	UPDATE THE NUCLIDE DATA FILE
6	PERFORM DOSE PROJECTION (NO DATA STORAGE)
7	LIST ACCUMULATED POPULATION DOSES FOR ANY SECTOR (A-R)
8	LIST ACCUMULATED GROUND CONTAMINATION FOR ANY SECTOR (A-R)
9	STOP PROGRAM EXECUTION

and proceed to the appropriate portion of this procedure.

NOTE: Option 1 should be used unless specific information available through one of the other options is sought.

STEP 6: PERFORM TYPICAL DOSE RATE CALCULATION:

a. Type in "1" and press carriage return. The terminal will respond by requesting that you enter current date information. Type in this information as it is requested. The terminal will then respond with:

PLEASE ENTER THE FOLLOWING METEOROLOGICAL DATA FROM
THE SEDAR COMPUTER PRINTOUT:

NOTE: If the meteorological tower met system data is unavailable, use backup tower data, by switching the met data printer to backup mode. Do this by placing the switch behind printer to backup tower position and changing speed switch under cover of printer to Hi speed for backup, low speed for primary. If neither backup or primary mode are operable refer to Attachment 4 and use the St. Cloud reporting station data for stability class, windspeed and wind direction data. Enter a Zero for the requested day and time information.

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ATTACHMENT 1 (Cont'd.)

PLEASE ENTER THE FOLLOWING EFFLUENTS RELEASE RATE DATA:

The terminal will request specific numerical information. Obtain this information from the Plant Computer CRTs and type it in as requested. If release rate data is not available, refer to Procedure A.2-405.

NOTE: During the early stages of an accident when Iodine release rates are not available, enter Iodine release rate values corresponding to about 2% of that release points noble gas release rate. This should be done until grab samples have been taken and analyzed. Grab samples should be taken and anlayzed as soon as possible.

b. The terminal will respond with a printout of off-site dose projections for the affected sector(s) from the Site Boundary to a distance of 10 miles. Communicate this information to the Radiological Emergency Coordinator.

c. The terminal will then print:

PLEASE ENTER THE OPTION YOU DESIRE:

d. Type in the option number per STEP 5 or STEP 9.

NOTE: MET data is updated every 15 minutes and that should be the frequency with which Option 1 is run during an emergency condition with an airborne release. You should continue to update dose rate data every 15 minutes until the Radiological Emergency Coordinator directs otherwise.

STEP 7: LIST ACCUMULATED DOSES FOR ANY SECTOR

a. Type in "2" and press carriage return. The terminal will respond with:

ENTER THE SECTOR (A-R) FOR WHICH YOU WANT THE ACCUMULATED DOSES REPORTED.

SECTOR:

b. Type in the sector letter (A-R). The terminal will ask you if you wish to perform dose projection calculations. Answer Y or N, then the terminal will respond with a printout of the accumulated doses for the affected sector from the Site Boundary to a distance of 10 miles. Communicate this information to the Radiological Emergency Coordinator.

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ATTACHMENT 1 (Cont'd.)

c. The terminal will then print:

PLEASE ENTER THE OPTION YOU DESIRE:

d. Type in the option number per STEP 5 or STEP 9.

STEP 8: SEARCH ALL SECTORS FOR HIGHEST DOSE AND REPORT DOSE DATA

a. Type in "3" and press carriage return. The terminal will respond with a printout of the accumulated dose values to the highest sector(s) as well as a list of the sectors where accumulated whole body or thyroid doses exceeded pre-programmed limits. Communicate this information to the Radiological Emergency Coordinator.

b. The terminal will then print:

PLEASE ENTER THE OPTION YOU DESIRE:

c. Type in the option numbers per STEP 5 or STEP 9.

STEP 9: Should it be desirable to cease dose projection activities for extended periods of time (with the concurrence of the Radiological Emergency Coordinator), when the terminal prints:

PLEASE ENTER THE OPTION YOU DESIRE:

Type in "9" and press carriage return. You may subsequently re-enter the program by typing in "RUN MODCOM".

STEP 10 Upon receiving instructions from the Radiological Emergency Coordinator to secure from dose projection activities, turn off all equipment and ensure that all data is appropriately filed.

WP/kk

ATTACHMENT 2

Page 1 of 4

DOSE PROJECTION BY HAND CALCULATION

EQUIPMENT REQUIRED

1. Calculator (with scientific notation capability)
2. Supply of OFF-SITE DOSE RATE PROJECTION WORKSHEET Forms (TSC), Form 5790-406-4 (Attachment 3)

PROCEDURE

STEP 1: In the INPUT DATA section of the worksheet, enter the date and time for which this projection will be made.

STEP 2: Enter the TIME AFTER REACTOR TRIP value. This is the elapsed time from the reactor trip to the time recorded in STEP 1. If there has not been a reactor trip, enter ZERO.

STEP 3: Determine the necessary meteorological parameters and record as indicated on the worksheet. This data should be taken from the meteorological tower printer. If the printer is unavailable, refer to Attachment 4.

NOTE: If the meteorological tower met system data is unavailable, use backup tower data, by switching the met data printer to backup mode. Do this by placing the switch beind printer to backup tower position and changing speed switch under cover of printer to Hi speed for backup, low speed for primary. If neither backup or primary mode are operable refer to Attachment 4 and use the St. Cloud reporting station data for stability class, windspeed and wind direction data. Enter a Zero for the requested day and time information.

a. RB Vent Stability Class - Divide the value for DT1 by 100, paying attention to whether the value is positive or negative. Use the result to enter Table I. Record the class designation.

b Stack Stability Class - Divide the value for DT2 by 100, paying attention to whether the value is positive or negative. Use the result to enter Table I. Record the class designation.

c. RB Vent Windspeed - Record the windspeed at the 33 feet level (use 1 mph when indication is zero).

d. Stack Windspeed - Record the windspeed at the 330 feet level (use 1 mph when indication is zero).

e. Stack Wind Direction - Record the wind direction at the 330 feet level. (If value is greater than 360, subtract 360 before recording.)

ATTACHMENT 2 (Cont'd.)

TABLE I

Stability Class	RB Vent (DT1/100)	Stack (DT2/100)
A	Less than -0.62	Less than -1.71
B	-0.62 to -0.56	-1.71 to -1.53
C	-0.55 to -0.49	-1.52 to -1.35
D	-0.48 to -0.16	-1.34 to -0.45
E	-0.15 to +0.49	-0.44 to +1.35
F	+0.50 to +1.31	+1.36 to +3.60
G**	Greater than +1.31	Greater than +3.60

** Stability Class G is not to be used. (Ref: Letter of 3/9/81 from certified consulting meteorologist to Bert Clark.) Use Class F when G is indicated.

STEP 4: Determine and record the SECTOR designation (A-R). Use the 330 feet wind direction and Table II to find the letter designation for the area directly downwind from the plant.

NOTE: If the wind speed indicates zero, use Sector designation "L" (most critical sector based on nearest receptor).

TABLE II

Wind Direction	Sector
168.75 to 191.25	A
191.25 to 213.75	B
213.75 to 236.25	C
236.25 to 258.75	D
258.75 to 281.25	E
281.25 to 303.75	F
303.75 to 326.25	G
326.25 to 348.75	H
348.75 to 11.25	J
11.25 to 33.75	K
33.75 to 56.25	L
56.25 to 78.75	M
78.75 to 101.25	N
101.25 to 123.75	P
123.75 to 146.25	Q
146.25 to 168.75	R

STEP 5: From Table III select and record the $X\bar{U}/Q$ values as required.

ATTACHMENT 2 (Cont'd.)

TABLE III

R.B. VENTS $X\bar{U}/Q$
Stab. Class

Distance	A-B-C	D	E	F-G
SB	6.4E-5	9.4E-5	1.2E-4	2.1E-4
NR	6.4E-5	9.4E-5	1.2E-4	2.1E-4
1	1.9E-5	4.3E-5	5.8E-5	1.9E-4
2	5.7E-6	1.7E-5	2.6E-5	1.0E-4
3	2.9E-6	1.0E-5	1.8E-5	7.4E-5
4	1.9E-6	7.2E-6	1.3E-5	5.9E-5
5	1.3E-6	5.1E-6	9.9E-6	4.8E-5
10	4.6E-7	2.1E-6	4.6E-6	2.6E-5

STACK $X\bar{U}/Q$
Stab. Class

Distance	A-B-C	D	E	F-G
SB	2.74-4	4.03E-7	6.17E-10	2.54E-18
NR	2.74-4	4.03E-7	6.17E-10	2.5E-18
1	1.2E-5	6.4E-6	1.6E-6	1.1E-9
2	5.0E-6	9.0E-6	7.0E-6	4.4E-7
3	2.7E-6	6.7E-6	6.4E-6	1.1E-6
4	1.8E-6	5.4E-6	6.2E-6	1.7E-6
5	1.3E-6	4.2E-6	5.4E-6	2.1E-6
10	4.5E-7	2.0E-6	3.6E-6	3.2E-6

STEP 6: From Table IV, determine and record the Noble Gases Factor and the Iodines Factor as appropriate for the elapsed time value previously recorded.

TABLE IV

Elapsed Time (Hours) From	To	Noble Gases Factor	Iodines Factor
0.00	0.49	6.49E-01	254
0.50	0.99	5.48E-01	282
1.00	1.99	4.06E-01	329
2.00	3.99	3.43E-01	398
4.00	7.99	2.93E-01	485
8.00	15.99	1.65E-01	607
16.00	23.99	8.70E-02	705
24.00	47.99	6.10E-02	923
48.00	95.99	3.90E-02	1117
96.00	167.99	3.30E-02	1270
168.00	335.99	3.30E-02	1280
336.00	719.99	3.20E-02	1280
720.00	1439.99	2.60E-02	1280
1440.00	Beyond	3.60E-03	1280

WP/kk

ATTACHMENT 2 (Cont'd.)

STEP 7: Record the release rates (μCi/sec) for the gas and iodine portions of the stack and vent effluents. The gas portion release rates may be obtained directly from effluent monitor readings. If direct monitor readings are unavailable, obtain release rates from procedure A.2-405 (Release Rate Determination). The iodine portions will be determined by Radiation Protection Group personnel through actual samples. If sample analysis data is not available, use a value of 2% of the noble gas release rate values.

STEP 8: Using the values recorded in the INPUT DATA section, complete calculations for the location of interest as required.

ATTACHMENT 3

Form 5790-406-4
Revision 2, 03/07/83
Page 1 of 1

Example of
OFF-SITE DOSE RATE PROJECTION WORKSHEET
(For use with Procedure A.2-406, Attachment 2)

INPUT DATA

Time _____ Date _____
Time After Reactor Trip _____ hours
Stability Class: RB Vent _____ Stack _____
Windspeed: RB Vent _____ mph (c) Stack _____ mph (c)
Wind Direction: _____ Sector _____

Location (S.B., N.R., or distance): _____

$X\bar{U}/Q$ Value for Location (m^{-2}): _____

Noble Gas Release Rate (μCi/sec): _____ (a)

Noble Gas Factor (mrem-m^3/hr-μCi): _____ (b)

Iodines Release Rate (μCi/sec): _____ (d)

Iodines Factor (mrem-m^3/hr-μCi): _____ (e)

WHOLE BODY DOSE RATE

Compute: $\frac{(a) \times (b) \times \bar{X}U/Q}{(c) \times .447 \frac{m/s}{mph}}$ = _____ mrem/hr

THYROID DOSE RATE

Compute: $\frac{(d) \times (e) \times \bar{X}U/Q}{(c) \times .447 \frac{m/s}{mph}}$ = _____ committed mrem/hour of exposure.

REVIEW AND APPROVAL

Completed by: _____ / _____ Date _____

Reviewed by: _____ Date _____
Radiological Emergency Coordinator

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

ATTACHMENT 4

PROCEDURE FOR USE OF THE WEATHER INFORMATION SERVICE

EQUIPMENT: Western Union Terminal, Telephone and Accoustic Coupler

1. Turn terminal on (back right of terminal).
   Set terminal to MED Speed.
   Set terminal to full duplex, modem set to full duplex.
   Set all caps key to ON.
   Depress on-line button.

2. DELETED
   When tone is heard, place phone in terminal coupler with the cord to the rear. Green light on coupler in 5-15 seconds.

NOTE: If no green light, hang-up and re-do STEP 2.

	OPERATOR ACTION	PRINTER OUTPUT
3.	Press return twice.	TELENET TERMINAL=
4.	Type "D1" Press return	@
5.	Type "C 617133" Press return.	617 133B CONNECTED
6.	Press return.	PLEASE LOG IN
7.	Type "LOGIN NSM". Press return.	PASSWORD
8.	Type "POWER". Press return.	LOGGED INTO WEATHER SERVICES ------- ---------- +

+ Indicates computer awaiting instructions.

9. Type"MONT".
   Press return.

10. When printout is completed type "LOGOUT".
    Press return.

When computer prints out that it is disconnected immediately hang-up phone.

NOTE: Use this service only as needed.

WP/kk

ATTACHMENT 5

CLASS V04.24.24-RT
16-NOV-77

SYSTEM VERIFICATION
EXAMPLE

*RUN MODCOM

INITIAL EVALUATION ? " YES

ARE YOU SURE ? (IF SO ANSWER YES) : YES

FREQUENCY AT WHICH YOU WISH TO PERFORM COMPUTATIONS
(15,30,OR 60 MINUTES) : 15

THE AVAILABLE OPTIONS ARE AS FOLLOWS:

OPTION DESCRIPTION

1 PERFORM TYPICAL DOSE RATE CALCULATION
2 LIST ACCUMULATED DOSES FOR ANY SECTOR (A-R)
3 SEARCH ALL SECTORS FOR HIGHEST DOSE AND REPORT DOSE DATA
4 PRINT ALL SECTOR DOSES (A-R) AT A SPECIFIED DISTANCE
5 UPDATE THE NUCLIDE DATA FILE
6 PERFORM DOSE PROJECTION (NO DATA STORAGE)
7 LIST ACCUMULATED POPULATION DOSES FOR ANY SECTOR (A-R)
8 LIST ACCUMULATED GROUND CONTAMINATION FOR ANY SECTOR (A-R)
9 STOP PROGRAM EXECUTION

PLEASE ENTER THE OPTION YOU DESIRE: 6

THIS IS EVALUATION # 1
PLEASE ENTER THE FOLLOWING :
CURRENT YEAR 1982
CURRENT MONTH OF YEAR (1-12) : 07
CURRENT DAY OF MONTH (1-31) : 28

PLEASE ENTER THE FOLLOWING METEOROLOGICAL DATA FROM SEDAR
COMPUTER PRINTOUT :

DAY AND TIME (7 DIGIT NUMBER) : 2090830
33' WINDSPEED : 8
330' WINDSPEED : 5
33' WIND DIRECTION : 337
330' WIND DIRECTION : 6
DT1 (VALUE MAY BE NEGATIVE) : -43
DT2 (VALUE MAY BE NEGATIVE) : -76

PLEASE ENTER THE FOLLOWING EFFLUENTS RELEASE RATE DATA :

STACK GAS µCI/SEC. : 1.0E7
STACK IODINES µCI/SEC. : 2.0E5
STACK PARTICULATES µCI/SEC. : 1.0E4
R.B.V. GAS µCI/SEC. : 1.0E7
R.B.V. IODINES µCI/SEC. : 2.0E5
R.B.V. PARTICULATES µCi/SEC. : 1.0E4

WP/kk

ATTACHMENT 5 (Cont'd.)

MONTICELLO NUCLEAR GENERATING PLANT
OFFSITE DOSE RATE COMPUTATIONS

SPECIAL CALCULATION :

7-28-82 0830

STACK SECTOR = J S. VENTS SECTOR = H SSE
STACK WINDSPEED = 5 MPH, VENTS WINDSPEED = 8 MPH
MAX PLUME DISTANCE = 10 MILES.
STACK STABILITY CLASS = D. VENTS STABILITY CLASS = D
NO STACK FUMIGATION
THE CALCULATED WHOLE BODY DOSE RATE VALUES ARE IN MREM/HOUR.
THE CALCULATED THYROID DOSE RATE VALUES ARE COMMITTED MREM PER HOUR OF EXPOSURE.

	STACK W. BOD. MREM/HR FINITE	STACK W.BOD. MREM/HR SEMINF	STACK THYROID MREM/HR	EST'D PLUME ARRIV	VENTS W.BOD. MREM/HR	VENTS THYROID MREM/HR
S.B.	9.7	5.33E-04	4.92E-03	8:32	4.51E+02	3.64E+03
N.R.	7.3	0.2	2.4	8:36	96.	1.05E+03
1 MI	5.0	9.1	1.46E+02	8:37	56.	7.52E+02
2 MI	2.8	8.5	1.78E+02	8:45	16.	2.66E+02
3 MI	1.9	5.9	1.54E+02	8:52	7.5	1.45E+02
4 MI	1.2	3.7	1.18E+02	9: 0	4.2	95.
5 MI	0.7	2.3	90.	9: 7	2.7	68.
6 MI	0.5	1.4	72.	9:15	1.8	52.
7 MI	0.3	0.9	60.	9:22	1.2	42.
8 MI	0.2	0.5	50.	9:30	0.8	34.
9 MI	0.1	0.3	43.	9:37	0.6	29.
10MI	9.90E-02	0.2	37.	9:45	0.4	25.

	STACK PLUME WIDTH METERS	STACK X/Q SEC/M3	VENTS PLUME WIDTH METERS	VENTS X/Q SEC/M3
S.B	1.72E+02	1.10E-10	1.87E+02	8.11E-05
N.R.	2.51E+02	5.33E-08	4.05E+02	2.34E-05
1 MI	4.95E+02	3.25E-06	4.95E+02	1.68E-05
2 MI	9.26E+02	3.96E-06	9.26E+02	5.92E-06
3 MI	1.34E+03	3.43E-06	1.34E+03	3.24E-06
4 MI	1.73E+03	2.64E-06	1.73E+03	2.12E-06
5 MI	2.12E+03	2.01E-06	2.12E+03	1.52E-06
6 MI	2.50E+03	1.60E-06	2.50E+03	1.17E-06
7 MI	2.87E-03	1.33E-06	2.87E+03	9.30E-07
8 MI	3.24E+03	1.11E-06	3.24E+03	7.65E-07
9 MI	3.60E+03	9.48E-07	3.60E+03	6.45E-07
10MI	3.96E+03	8.21E-07	3.96E+03	5.53E-07

WP/kk

ATTACHMENT 5 (Cont'd.)

****

NOTE TO SHIFT SUPERVISOR OR R.E.C.

WHOLE BODY PROTECTIVE ACTION GUIDELINE = 1000 MREM.
THYROID PROTECTION ACTION GUIDELINE = 5000 MREM.

	SECTOR J S		SECTOR H SSE	
DISTANCE	HOURS TO REACH A PAG		EST'D PLUME ARRIVAL TIME	HOURS TO REACH A PAG
S.B.	1.03E+02		8:32	1.4
N.R.	1.37E+02		8:36	4.8
1 MI	34.		8:37	6.7
2 MI	28.		8:45	19.
3 MI	33		8:52	34.
4 MI	42.		9: 0	53.
5 MI	55.		9: 7	73.
6 MI	70.		9:15	96.
7 MI	84.		9:22	1.20E+02
8 MI	1.00E+02		9:30	1.46E+02
9 MIN	1.18E+02		9:37	1.73E+02
10 MIN	1.36E+02		9:45	2.02E+02

INITIATE EMERGENCY PROCEDURE A.2-105, ATTACHMENT 2.
CONSIDER PROTECTIVE ACTION FOR SECTOR H SSE

PLEASE ENTER THE OPTION YOU DESIRE : 9

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes ___ No X

ESTABLISHMENT OF A SECONDARY ACCESS CONTROL POINT

Procedure A.2-411

REVIEW AND APPROVAL

Prepared by: [signature] ALARA Review: Revision 0 Date 1/26/82

Reviewed by: [signature] Q.A. Review: Revision 0 Date 1/27/82

Operations Committee Final Review: Meeting Number 1199 Date 4/28/83

Approved by: [signature] Date 5-3-83

Oper. Com. Results Review: Not Required Mtg. # 1064 Date 2/18/82

PURPOSE

The purpose of this procedure is to provide instructions for establishing Access Control at an alternate location in the event that the active Access Control must be relocated.

CONDITIONS AND PREREQUISITES

A. High radiation exposure rates, contamination or airborne are present in the active Access Control area.

B. The REC has recommended that Access Control be moved and the Emergency Director has so directed.

ORGANIZATION AND RESPONSIBILITIES

A. Overall Responsibility - Emergency Director

B. In Charge - Radiological Emergency Coordinator (REC)

C. Procedure Implementation - Radiation Protection Coordinator

DISCUSSION

The procedure establishes a Secondary Access Control Point ensuring that all personnel are properly badged with TLDs and dosimeters when the normal access control point has been evacuated. It will also ensure that a means is available to monitor individual exposure and prevent exceeding exposure control limits.

RESPONSIBILITIES

A. Radiological Emergency Coordinator

1. Evaluate survey results and make recommendations to the Emergency Director regarding the necessity and location for a Secondary Access Control Point.

WP/kk

2. Continue to monitor survey results, re-evaluating need and location of the Secondary Access Control Point.

B. Radiation Protection Coordinator (RPC)

Upon notification of the establishment of a Secondary Access Control Point implement this procedure and insure that all items listed in Figure 1 of this procedure are transported to the Secondary Access Control Point.

PROCEDURE

STEP 1 On notification to establish a Secondary Access Control Point, transfer all TLD badges, self-reading dosimeters (low and high range), dosimeter chargers, personal history forms, exposure records and blank dosimeter cards from the normal Access Control Point to the designated Secondary Access Control Point. List of specific items are on Attachment 1.

STEP 2 Designate an RPS to be in charge of the Secondary Access Control Point. Insure that Radiation Protection Group personnel maintain exposure control at the Secondary Access Control Point on a continuous basis (twenty four (24) hours per day). Insure the issuance of TLD's and dosimeters is in accordance with Radiation Protection procedures.

NOTE: With the possibility of high radiation areas existing, all personnel shall complete an Exposure History Form (NRC Form 4) prior to entry into controlled areas which could result in exposure exceeding 300 millirem.

STEP 3 Establish communications between Secondary Access Control and the REC.

STEP 4 Place Secondary Access Control Point into operation following normal Access Control procedures.

STEP 5 Complete Establishment of Secondary Access Control Point Checklist, Form 5790-411-1.

WP/kk

Figure 1

Secondary Access Control Point Equipment

1. All unissued TLD's (50 additional TLD's are located at the EOF)
2. About 100 0-5R Dosimeters
3. About 50 0-1R Dosimeters
4. About 100 0-200 mR Dosimeters
5. Dosimeter Charger/Spare Battery
6. TLD Log Book
7. Personal History Forms (#5525)
8. NRC-4 Forms
9. Monticello & Prairie Island Exposure Log Books
10. Pens
11. RWP Blank Forms (#5608)
12. Blank Dosimeter Cards
13. Marking Pens
14. High Radiation/Airborne Area Entry Logs (#5503)
15. Emergency Radio
16. Computer Exposure Records
17. Frisker

WP/kk

ATTACHMENT 1

Form 5790-411-1
Revision 1, 03/24/83
Page 1 of 1

Example of
Establishment of a Secondary Access Control Point
Checklist

1. Date and Time Notified to Move Access Control:

   Date: _____ Time: _____ _____
   Signature

2. Equipment Moved to New Access Control Location:

   _____
   Signature

3. RPS Designated to be in charge of Secondary Access Control:

   _____ _____
   Name of Person In Charge Signature

4. Secondary Access Control in Operation:

   Date: _____ Time: _____ _____
   Signature

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

CONTAINMENT GAS SAMPLE OBTAINED AT POST ACCIDENT SAMPLING SYSTEM

Procedure A.2-415

Prepared by: L R Pogson ALARA Review: Carl Mathews Date 3/20/83
Reviewed by: T A Grove Q.A. Review: Revision 0 Date 8/16/82
Operations Committee Final Review: Meeting Number: 1198 Date 4/21/83
Approved by: J L Fay Date 4-27-83
Op. Com. Results Review: Not Required Mtg. # 1100 Date 7/29/82

PURPOSE

The purpose of this procedure is to provide special instructions and precautions for collection and handling of containment gas samples during and following an emergency at Monticello Nuclear Generating Plant.

CONDITIONS AND PREREQUISITES

The Emergency Director/REC/CSL has requested analysis of torus, drywell or secondary containment (935') gas samples.

Actual or potential radiological conditions are such that special methods and/or precautions are necessary in order to collect and analyze samples under conditions which may present a much greater than normal radiation hazard to individuals performing the sampling and analyses. Unless directed otherwise, this procedure should be used in lieu of routine sampling and analysis procedures whenever an Alert or higher emergency classification is declared.

The torus and drywell gas sample line heat tracing should be on per Procedure A.2-425.

If a Group 2 isolation signal exists refer to Operations Manual Section B.4.1 for instructions to opening the samples valves (except SV-4081 and SV-4082) in STEP 1 of this procedure. To open sample isolation valves SV-4081 and SV-4082 (mid-drywell sample) an operator shall perform the following steps:

1. Place the handswitches at panel C26 for the following valves to CLOSE:

SV-3307	CV-3311	CV-3313	SV-4081
SV-3308	CV-3312	CV-3314	SV-4082

2. At panel C26, lift and tape the external wires at the following terminals:

   a. Q530/1
   b. Q528/1

WP/kk

3. At panel C26, jumper the following terminals:

   a. Q530/X1 - Q530/1
   b. Q528/X1 - Q528/1

4. Open sample isolation valves SV-4081 and SV-4082 by placing the handswitches HS-3305 and HS-3306 to AUTO/OPEN.

ORGANIZATION AND RESPONSIBILITIES

Emergency Director - Overall responsibility

REC/CSL - Responsible for assigning sample priority and frequency and results review.

Chemistry Technicians - Responsible for sample collection, analysis and results reporting.

PRECAUTIONS

A. Exposures of sampling and analysis personnel shall be in accordance with A.2-401, "Emergency Exposure Control".

B. Exposure to all personnel due to sampling and analysis operations should be maintained as low as is reasonably achieveable. Techniques such as temporary shielding, remote handling and sample dilution prior to analysis should be considered to reduce exposure to personnel.

C. When actual or potential radiation levels so warrant, high range portable survey instruments, and self-reading dosimeters shall be provided to sampling and analysis personnel to permit rapid assessment of high exposure rates and accumulated personnel exposure. Alarming dosimeters should also be considered.

D. Appropriate extremity dosimeters should be provided and worn when handling samples which themselves represent high level radiation sources.

E. Calculations for exposure rates resulting from radiation within a few hours after a Loss of Coolant Accident point out the desirability of spending minimum amount of time that is necessary near the surface of the sample enclosure. Most of the operation of the Post Accident Sampling System located at 951' of Turbine Building can be performed from the control panel. With the control panel located ten or more feet away from the sample enclosure the dose rates at the control panel due to radiation from the sample enclosure will be below 100 MR/HR. The indicator for the area radiation detector RE-507 is on the PASS control panel and its reading should be noted whenever the presence of radiation is suspected.

REMARKS

1. Prior to sampling notify the Control Room and advise Shift Supervisor of your intentions.

WP/kk

REMARKS (Cont'd.)

2. The Post Accident Sampling Station is located on the south side of the 951' level of the Turbine Building. The most efficient route to the PASS is through access control and into the Turbine Building. Move to the 951' level via the east stairway.

3. Two-man teams should be used to obtain a post-accident sample when possible.

4. Obtain controlled access key 33A from R.P. Coordinator and key #153 from Shift Supervisor.

EQUIPMENT REQUIRED

1. 15 ml sample vial
2. Gas vial positioner
3. Gas vial carrying cask
4. Needles
5. Neoprene cap
6. Needle changing tool
7. Flashlight
8. Vial retainer ring crimper
9. Aluminum retainer ring

PROCEDURE

STEP 1 Call Control Room and request an operator open the following valves depending on the sample desired (the opening of these valves shall be documented on the attached checklist):

Sample	Valves	Control Panel	Description
Drywell	SV-4081	C26	PAS System Isol. Valve
	SV-4082	C26	PAS System Isol. Valve
	SV-4020A	C259	Inboard Drywell Isol. Valve
	SV-4001A	C259	Outboard Drywell Isol. Valve
	SV-4004A	C259	Inboard Sx Return Isol. Valve
	SV-4005A	C259	Outboard Sx Return Isol. Valve
Torus	SV-4002A	C259	Inboard Torus Isol. Valve
	SV-4003A	C259	Outboard Torus Isol. Valve
	SV-4002B	C260	Inboard Torus Isol. Valve
	SV-4003B	C260	Outboard Torus Isol. Valve
	SV-4004A	C259	Inboard Sx Return Isol. Valve
	SV-4005A	C259	Outboard Sx Return Isol. Valve

STEP 2 Open the nitrogen supply and regulate the supply pressure to 100 psi.

STEP 3 Turn on ventilation unit by depressing "START" button. Verify vacuum by feeling suction at one of the gas ports.

STEP 4 Set switch HC-600 to position A if not already done. With the "Sump Drain System Switch" (HC-715) in the off position place switch HC-700 (Liquid/Gas Selector) in the "Gas" position.

WP/kk

PROCEDURE (Cont'd.)

STEP 5 Install the gas filter drawer into position.

STEP 6 Place a standard 15 milliliter off-gas vial with rubber septum into the gas vial positioner, slide the positioner into the gas port (the higher of the two ports) at the sample station and turn it to lock it into place. Observe that the bottle status light changes from red to green.

STEP 7 Turn the "Gas Sample Selector Switch" (HC-723) to the desired sample location. In addition set switch HC-500 to the position corresponding to the sample desired.

STEP 8 Turn the "15 ML Gas Sample Switch" (HC-705) to position 2 and "Circulate Gas" for a minimum period of 5 minutes. Be sure that there is flow as read by the rotameter through the sample enclosure window (FI-725). Record flow and flush duration on the Containment Gas Sampling and Analysis Checklist, Form #5790-415-1.

STEP 9 Turn HC-705 to position 3 and "Evacuate" the off-gas vial. Record the pressure of the evacuated vial (PI-708) on the checklist. (Make sure the vacuum in the gas vial reaches a stable minimum reading before recording pressure.)

STEP 10 Turn HC-705 to position 4 "Take Sample". Observe that the pressure reading on PI-708 does not change as such would indicate a system leak.

STEP 11 Press the button to the left of HC-705 (HC-720 "Press for Sample") to obtain a sample. Keep this button depressed until a steady pressure is reached. This will require approximately 5 seconds. Record the final pressure of the sample (PI-708) on the checklist. This pressure corresponds to the actual pressure of the sample being obtained. Record sample temperature (TI-724) on the checklist.

STEP 12 Turn HC-705 to position 5 "FLUSH SYSTEM" and flush for approximately 1 minute or until the area radiation monitor located on the sample station reaches a minimum.

STEP 13 Turn HC-705 through position 6, 7 and 8 and then straight up to "OFF".

STEP 14 Turn to unlock and withdraw the gas vial positioner. Keep the vial at a maximum distance and quickly insert the sample bottle into the gas vial cask. Close and latch the gas vial cask. Put the gas vial positioner back into the port in the sample station.

STEP 15 Perform the Drain, Sump and Collection procedure (Procedure A.2-417).

STEP 16 Call Control Room and request that an operator close the valves that were opened in STEP 1 (the closing of these valves shall be documented on the attached checklist).

STEP 17 Turn ventilation off by depressing "STOP" button.

WP/kk

PROCEDURE (Cont'd.)

STEP 18 Transport the sample to the hot lab for dilution and counting per Containment Atmosphere Radiochemical Analysis, Procedure A.2-420, or for hydrogen, oxygen and nitrogen per Chemistry Procedure I.1.36.

STEP 19 Calculate the sample volume (see NOTE 1) at the sample pressure and temperature as recorded in STEP 11 and record on Containment Gas Sampling and Analysis Checklist.

NOTE 1 Temperature and pressure values must be converted to units of °Kelvin and atmospheres prior to calculating gas volume.

$$\frac{\text{psia}}{14.70} = \text{atmosphere}$$

$$\frac{5}{9} \times (°F-32) + 273.15 = °\text{Kelvin}$$

$$14.9 \times \frac{P_1}{T_1} \times 298.15 = \text{actual sample volume (cc)}$$

Where P_1 = final sx pressure (atm)-absolute pressure of vial (atm)
T_1 = TI-724 (converted to °Kelvin)

Form 5790-415-1
Revision 2, 03/18/83
Page 1 of 2

Example of

CONTAINMENT GAS SAMPLING AND ANALYSIS CHECKLIST

Sampling

		Initial
1.	Sample Source _____ Date _____ Time _____	_____ RPS
2.	Sample Identification No. _____	
3.	Sample Flow _____ FI-725 Flush Duration _____ Min.	_____
4.	Absolute Pressure of Vial _____ PI-708 (psia)	_____
5.	Final Sample Pressure _____ PI-708 (psia)	_____
6.	Sample Temperature _____ TI-724 (°F)	_____
7.	Calculated Sample Volume _____ cc (As Calculated)	_____

Open the following valves corresponding to the desired sample (STEP 1 of procedure).

Sample	Valves	Control Panel	Valve Opened By (Operator)	Verified By (RPS)
Drywell	SV-4081	C26	_____	_____
	SV-4082	C26	_____	_____
	SV-4020A	C259	_____	_____
	SV-4001A	C259	_____	_____
	SV-4004A	C259	_____	_____
	SV-4005A	C259	_____	_____
Torus	SV-4002A	C259	_____	_____
	SV-4003A	C259	_____	_____
	SV-4002B	C260	_____	_____
	SV-4003B	C260	_____	_____
	SV-4004A	C259	_____	_____
	SV-4005A	C259	_____	_____

WP/kk

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Close the following valves corresponding to the desired sample (STEP 16 of procedure).

Sample	Valves	Control Panel	Valve Closed By (Operator)	Verified By (RPS)
Drywell	SV-4081	C26		
	SV-4082	C26		
	SV-4020A	C259		
	SV-4001A	C259		
	SV-4004A	C259		
	SV-4005A	C259		
Torus	SV-4002A	C259		
	SV-4003A	C259		
	SV-4002B	C260		
	SV-4003B	C260		
	SV-4004A	C259		
	SV-4005A	C259		

Analysis

1. Spectrum Ran (Dilution Factors _____ x _____) _____
2. Spectrum Analyzed _____
3. Activity Calculated _____ µCi/cc _____
4. % H_2 - O_2 - N_2 _____ (See Chemistry Procedure I.1.36) _____
5. Other analysis results as requested and comments:

_____

_____

_____

_____

Performed By: _____ Date: _____

Reviewed by: CSL or REC _____ Date: _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

CONTAINMENT IODINE AND PARTICULATE SAMPLES OBTAINED AT POST ACCIDENT SAMPLING SYSTEM

Procedure A.2-416

Prepared by: [signature] ALARA Review: [signature] Date 3/24/83
Reviewed by: [signature] Q.A. Review: Revision 0 Date 8/4/82
Operations Committee Final Review: Meeting Number: 1198 Date 4/21/83
Approved by: [signature] Date 4-27-83
Op. Com. Results Review: Not Required Mtg. # 1100 Date 7/29/82

PURPOSE

The purpose of this procedure is to provide special instructions and precautions for collection and handling of iodine and particulate samples during and following an emergency at Monticello Nuclear Generating Plant.

CONDITIONS AND PREREQUISITES

The Emergency Director/REC/CSL has requested iodine/particulate analysis of torus, drywell or secondary containment (935') gas samples.

Actual or potential radiological conditions are such that special methods and/or precautions are necessary in order to collect and analyze samples under conditions which may present a much greater than normal radiation hazard to individuals performing the sampling and analyses. Unless directed otherwise, this procedure should be used in lieu of routine sampling and analysis procedures whenever an Alert or higher emergency classification is declared.

The torus and drywell gas sample line heat tracing should be on per Procedure A.2-425.

If a Group 2 isolation signal exists refer to Operations Manual Section B.4.1 for instructions to opening the sample valves (except SV-4081 and SV-4082) in STEP 1 of this procedure. To open sample isolation valves SV-4081 and SV-4082 (mid-drywell sample) an operator shall perform the following steps:

1. Place the handswitches at panel C26 for the following valves to CLOSE:

SV-3307	CV-3311	CV-3313	SV-4081
SV-3308	CV-3312	CV-3314	SV-4082

2. At panel C26, lift and tape the external wires at the following terminals:

   a. Q530/1
   b. Q528/1

CONDITIONS AND PREREQUISITES (Cont'd.)

3. At panel C26, jumper the following terminals:

   a. Q530/X1 - Q530/1
   b. Q528/X1 - Q528/1

4. Open sample isolation valves SV-4081 and SV-4082 by placing the handswitches HS-3305 and HS-3306 to AUTO/OPEN.

ORGANIZATION AND RESPONSIBILITIES

Emergency Director - Overall responsibility

REC/CSL - Responsible for assigning sample priority and frequency and results review.

Chemistry Technician - Responsible for sample collection, analysis and results reporting.

PRECAUTIONS

A. Exposures of sampling and analysis personnel shall be in accordance with A.2-401, "Emergency Exposure Control".

B. Exposures to all personnel due to sampling and analysis operations should be maintained as low as is reasonably achieveable. Techniques such as temporary shielding, remote handling and sample dilution prior to analysis should be considered to reduce exposure to personnel.

C. When actual or potential radiation levels so warrant, high range portable survey instruments, and self-reading dosimeters shall be provided to sampling and analysis personnel to permit rapid assessment of high exposure rates and accumulated personnel exposure. Alarming dosimeters should also be considered.

D. Appropriate extremity dosimeters should be provided and worn when handling samples which themselves represent high level radiation sources.

E. Calculations for exposure rates resulting from radiation within a few hours after a Loss of Coolant Accident point out the desirability of spending minimum amount of time that is necessary near the surface of the sample enclosure. Most of the operation of the Post Accident Sampling System located at 951' of Turbine Building can be performed from the control panel. With the control panel located ten or more feet away from the sample enclosure the dose rates at the control panel due to radiation from the sample enclosure will be below 100 MR/HR. The indicator for the area radiation detector RE-507 is on the PASS control panel and its reading should be noted whenever the presence of radiation is suspected.

REMARKS

1. Prior to sampling notify the Control Room and advise Shift Supervisor of your intentions.

2. The Post Accident Sampling Station is located on the south side of the 951' level of the Turbine Building. The most efficient route to the PASS is through access control and into the Turbine Building. Move to the 951' level via the east stairway.

3. Two-man teams should be used to obtain a post-accident sample when possible.

4. Obtain controlled access key 33A from R.P. Coordinator and key #153 from Shift Supervisor.

EQUIPMENT REQUIRED

1. Silver zeolite cartridges (4)
2. Particulate filters
3. Sample carrying cask
4. Poly bag (medium)
5. Radector III or equivalent

PROCEDURE

STEP 1 Call the Control Room and request that an operator open the following valves depending on the sample desired (the opening of these valves shall be documented on the attached checklist):

Sample	Valves	Control Panel	Description
Drywell	SV-4081	C26	PAS System Isol. Valve
	SV-4082	C26	PAS System Isol. Valve
	SV-4020A	C259	Inboard Drywell Isol. Valve
	SV-4001A	C259	Outboard Drywell Isol. Valve
	SV-4004A	C259	Inboard Sx Return Isol. Valve
	SV-4005A	C259	Outboard Sx Return Isol. Valve
Torus	SV-4002A	C259	Inboard Torus Isol. Valve
	SV-4003A	C259	Outboard Torus Isol. Valve
	SV-4002B	C260	Inboard Torus Isol. Valve
	SV-4003B	C260	Outboard Torus Isol. Valve
	SV-4004A	C259	Inboard Sx Return Isol. Valve
	SV-4005A	C259	Outboard Sx Return Isol. Valve

STEP 2 Open the nitrogen supply and regulate the supply pressure to 100 psi.

STEP 3 Turn on ventilation unit by depressing "START" button. Verify vacuum by feeling suction at one of the two gas ports.

STEP 4 Set switch HC-600 to position A if not already done. Set switch HC-500 to the position corresponding to the sample desired.

PROCEDURE (Cont'd.)

STEP 5 Verify that the "Sump Drain System" (switch HC-715) is in the OFF position. Place switch HC-700 (Liquid/Gas Selector) in the Gas position.

NOTE 1 See Attachment 1 for a description of filter cartridge retainer.

STEP 6 Pull out the gas filter drawer and check the filter cartridges. If not already in place, put the 4 filter cartridges (numbered 1 through 4) into the cartridge retainer, and a particulate filter paper in the cap of the cartridge retainer. Then put the cartridge retainer into the gas filter drawer and put the drawer into the sample station and verify that the drawer position light is green.

STEP 7 If a high activity condition exists or is suspected a timed sample should be taken. For a timed sample set the timer KC-712 between the range of 0 to 30 seconds. Select a low enough time so that the activity on the filter cartridge will not be unnecessarily high and cause special handling problems. It is suggested that 5 seconds be used for the first try. Observe the RE-704 reading to determine if there is a rapid activity buildup. (This reading will also include non-adsorbing gases.) If the activity level does not exceed a preset value of 10 mR/hr, another timed flow through the cartridges can be made. Record the selected time on the Iodine/Particulate Sampling and Analysis Checklist, Form #5790-416-1 or record that the sample is untimed. Set the switch located to the left of the timer labeled "Time Sample" on either yes or no as appropriate. If the activity of the first filter is > 10 mR/hr the 2nd, 3rd or 4th filters may be used for counting assuming previous filters are 99% efficient.

STEP 8 Turn the "Gas Sample Selector Switch" (HC-723) to the desired sample source.

STEP 9 Turn the "Iodine Cartridge Sample Switch" (HC-712) to position 2 and "Circulate Gas" for a minimum period of 5 minutes. Record the flush time on the checklist.

STEP 10 Observe flow as read by the rotameter which is visible through the window in the sample station enclosure. Record the flow (FI-725), temperature (TI-724) and pressure PI-726 and PI-727 on the checklist. The two pressure gauges (PI-726 and PI-727), as read through the window, should be the same.

When the switch HC-712 is turned to position 3 the sample gas will start to flow through the filter cartridges. When the upstream pressure (PI-727) is $\geq$ 16 inches of Hg. and PI-726 is about 0 inches of Hg, the flow will be "critical". For a short duration timed cycle it will be necessary to have one technician ready to read the down-stream pressure gauge at the sample station while another turns the selector switch at the control panel in order to verify that the flow is "critical". When ready, turn switch HC-712 to position 3. On the

PROCEDURE (Cont'd.)

checklist record pressure PI-727, PI-726 and the sample time duration in seconds. If flow is not critical record flow as indicated by FI-725.

STEP 11 After the timer has timed out for a timed sample or after the appropriate time has elapsed for a non-timed sample, turn selector switch HC-712 to position 4 to evacuate the filter cartridge.

STEP 12 After approximately 10 seconds turn switch HC-712 to position 5 which will admit an air or nitrogen flush through the filter cartridge to remove Krypton and Xenon gases. This purge should last approximately 20 seconds or until RI-704 is stable. Read and record RI-704 on the checklist.

STEP 13 Rotate HC-712 to its up and off position. Turn other switches off. Withdraw the filter drawer and remove the cartridge retainer and put it into a plastic bag. Close the bag and tie or tape it closed. Put the filter drawer back into the sample enclosure.

CAUTION: No shielding cask is provided for the cartridge retainer and filter(s). Survey the plastic bag which contains the sample and determine the dose rate. Use tongs to increase your distance from the sample. At the hot lab remove the filter cartridges.

STEP 14 Perform the Drain of Trap, Sump and Collector Procedure (Procedure A.2-417).

STEP 15 Call Control Room and request that an operator close the valves that were opened in STEP 1 (the closing of these valves shall be documented on the attached checklist).

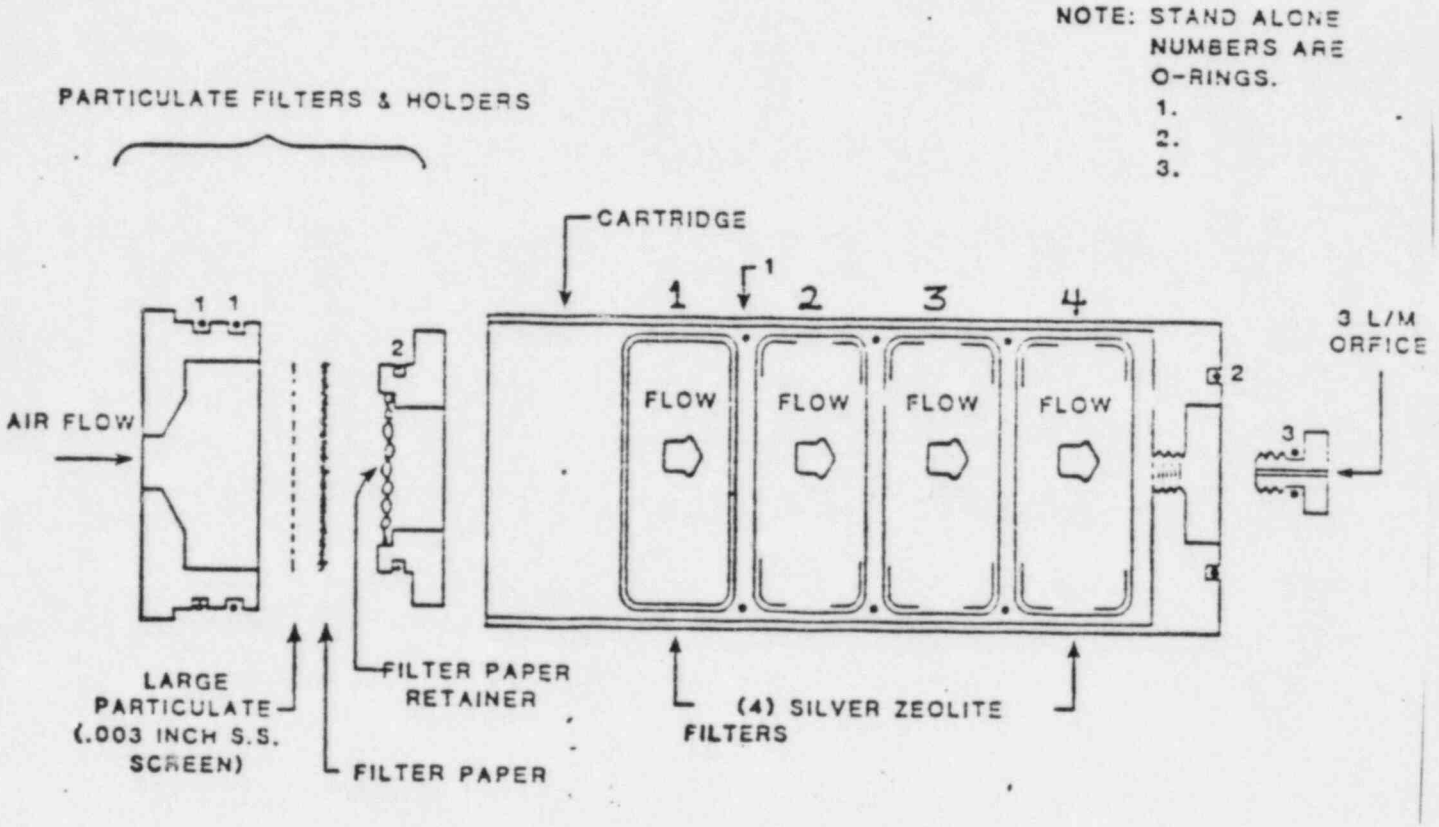
STEP 16 Turn ventilation off by depressing "STOP" button.

STEP 17 Transport the cartridge retainer to the hot lab for preparation for radiochemical analysis per Procedure A.2-421.

STEP 18 Remove the filter cartridges and label 1, 2, 3 and 4. Install new particulate and silver zeolite cartridges into the cartridge retainer for the next sample.

Attachment 1
Page 1 of 1

CUT AWAY VIEW OF FILTER CARTRIDGE



NOTE: Place cartridge into sample drawer with orifice end to the fixed butting surface.

WP/kk

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IODINE/PARTICULATE SAMPLING AND ANALYSIS CHECKLIST

SAMPLING

1. Sample Source _____ Date _____ Time _____ _____ RPS
2. Sample Identification No. _____
3. Time Sample YES or NO _____
4. Flush Time in Minutes _____
5. Sample Flow _____ SCFM FI-725 (not through cartridge)
   Temperature _____ TI-724 (°F)
   Pressure _____ PI-726 (psia)
   Pressure _____ PI-727 (psia)
6. Pressure _____ PI-726 (flow through cartridge)
   Pressure _____ PI-727 (flow through cartridge)
   If flow not critical,
   Sample Flow _____ SCFM FI-725
   If flow critical flow is 3 liters/min.
   Flow Duration _____ Seconds
8. Radiation _____ RI-704 (mR/hr)

Open the following valves corresponding to the desired sample (STEP 1 of Procedure):

Sample	Valves	Control Panel	Valve Opened by (Operator)	Verified by (RPS)
Drywell	SV-4081	C26		
	SV-4082	C26		
	SV-4020A	C259		
	SV-4001A	C259		
	SV-4004A	C259		
	SV-4005A	C259		
Torus	SV-4002A	C259		
	SV-4003A	C259		
	SV-4002B	C260		
	SV-4003B	C260		
	SV-4004A	C259		
	SV-4005A	C259		

WP/kk

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Close the following valves corresponding to the desired sample (STEP 15 of procedure):

Sample	Valves	Control Panel	Valve Closed by (Operator)	Verified by (RPS)
Drywell	SV-4081	C26		
	SV-4082	C26		
	SV-4020A	C259		
	SV-4001A	C259		
	SV-4004A	C259		
	SV-4005A	C259		
Torus	SV-4002A	C259		
	SV-4003A	C259		
	SV-4002B	C260		
	SV-4003B	C260		
	SV-4004A	C259		
	SV-4005A	C259		

ANALYSIS

		Initial
A.	IODINE	
1.	Spectrum Collected	
2.	Spectrum Analyzed	
3.	Sample Volume _____ cc	
4.	Activity Calculated _____ µCi/cc	
5.	Filter Number Counted (1-4) _____	
B.	PARTICULATE	
1.	Spectrum Collected	
2.	Spectrum Analyzed	
3.	Sample Volume _____ cc	
4.	Activity Calculated _____ µCi/cc	

WP/kk

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C. Other Analysis Results as Requested and Comments:

_____

Performed by: _____ Date _____

Reviewed by: CSL or REC _____ Date _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk